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Development of 3D Printer for House Construction Using Raspberry Pi Microprocessor

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Abstract: The utilization of recent technology, such as 3D printing, in construction industry allows the industry to use more efficient ways of erecting building. The presence of 3D printing machines really helps humans in visualizing an idea and the results of their thoughts into a very profitable replica. However, only a few of construction industry have utilized 3D printing technology in operation, and only a few countries have made it. The advantages of building a house with 3D printing technology include saving labor and time during house construction, as well as minimize the construction waste. The use of this 3D printing technology in construction industry in Indonesia will be very suitable because the population is very large and the need for housing will be directly proportional to population growth. The aims of this research are to develop a prototype 3D printer for housing construction, including development of controller software, suitable concrete material, and other peripheral hardware...

Keywords: House Construction, 3D Printer, Raspberry Pi

Introduction

The development of house-building technology has undergone many changes and progress, starting from crushed stone pairs, turning into wood pairs, then turning into red brick masonry, to the emergence of lightweight concrete innovations. The process of building houses generally uses a concrete construction as the frame, and bricks, or lightweight concrete as the walls, but this conventional work requires quite a long working time (Pramudyanto, 2017), besides that it requires a large amount of money. The reason for the high cost is use of labor required, for example in wall installation process, we needed one bricklayer, and two helpers tasked with helping preparing the materials. If the job needs to be completed in shorter time, it would need to increase

the number of workers, and as the consequences it will increase the cost (Fajar, 2019). In addition, the waste generated from construction work can also be a problem for the environment.

The increasing demand for housing in Indonesia from year to year is in line with the increasing in the population. The Statistics recorded that the total population of Indonesia in 2021 is 270.2 million people in which there are 70 million households. The increasing population of Indonesia certainly have an impact on the fulfillment of housing needs as it is exhibited in Figure 1, where there are 19 percent of families or around 13.3 million households who do not own house.

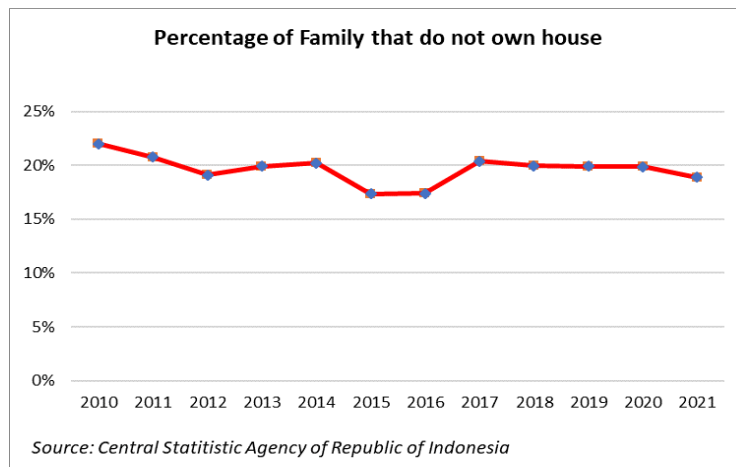


Figure 1. Housing Backlog 2010-2021

Due to low productivity of conventional building construction process, the government of Indonesia wishes to facilitate and accelerate the construction of a million houses supported by 3D printing technology (Haryanto, 2019). Therefore, there is a need to develop in country expertise in 3D printing for housing construction, and that is one of the reasons of conducting this research. This paper presents the development of a prototype of housing construction 3D printer including mechanical components, controller components, and concrete mixture formulation.

Method

The development of housing 3D printer prototype includes design and development of 3D printer machine, development of controller software using the Rapid Application Development (RAD) method, and development of a suitable concrete mixture material using experimental method. The project was planned for two years and this paper reports the progress of the first year since the second year is still on going. Figure 2 shows the method and phases used in this prototype development.

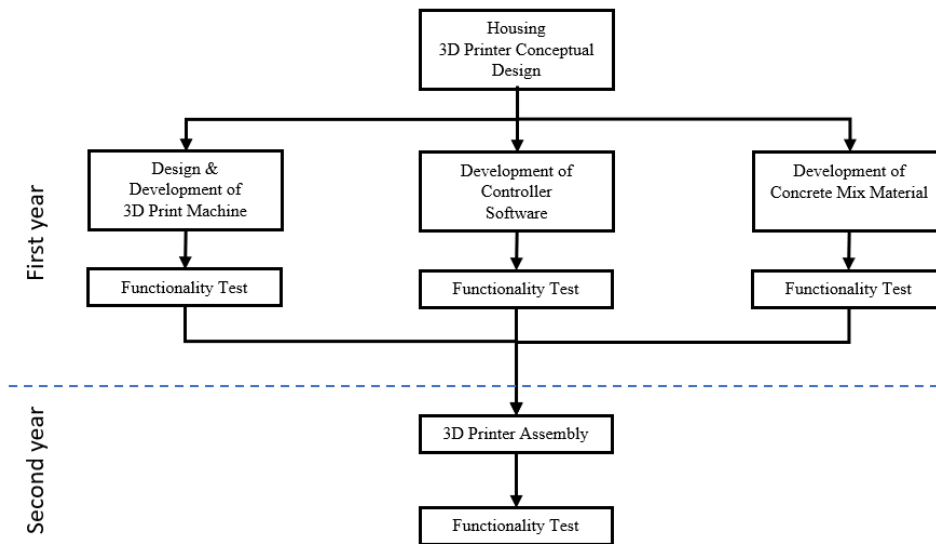


Figure 2. Housing 3D printer Development Method

Results and Discussion

Design and Development of 3D Printer Machine

The prototype of 3D printer machine was made of aluminum alloy 6061 profile sizing 40x80 mm and it is designed with 3 axis configurations (Duballet et al., 2017). There are also several connecting plates made of aluminum 5052. It uses Nema30 stepper motors: one motor of 3Nm holding torque for x axis, two motors for y axis and two motors for z axis, each of 1.8 holding torque.

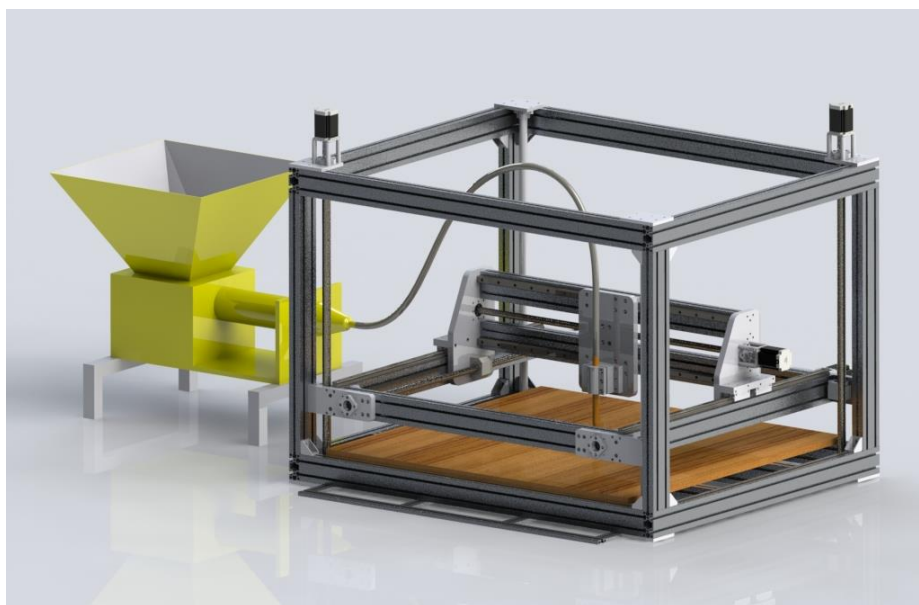


Figure 3. Design of Concrete 3D Printer Prototype

The 3D printer is equipped with a concrete pump to supply concrete mixture into the nozzle. The amount of volume and flow rate of concrete mixture are controlled by the software. Similarly, the motion and speed of the nozzle in x, y and z direction are also controlled by the software. The microprocessor used to drive the motors and concrete pump is Raspberry Pi that execute the instructions defined by the control software. At the moment, the fabrication is still on going and the assembly has partially completed. The motor connection has been tested and they work well in executing the instruction given from the controller software.



Figure 4. Fabrication of Prototype of Housing 3D Printer

Development of Controller Software

The 3D printer control software has the main task of controlling the printing process. The regulation of the process is carried out by providing control signals, in the form of digital signals, which must be given to the right points at the right time. This control signal regulates the actuator, which is a stepper motor, when to work (5 V) and when to stop (0 V). With its high capability in controlling stepper motor work precisely (up to sub millimeters), 3D printer control software can be used to print various shapes easily and quickly.

The precision of the stepper motor movement is controlled by the size or width of the pulse used (duty cycle). To adjust the pulse width, a microcontroller or computer is a very appropriate tool. With the ability to set the time up to microseconds and even nanoseconds, the microcontroller is able to adjust the pulse width flexibly and cheaply. The microcontroller is also powerful enough to operate non-stop during the printing process. With a good power supply and cooling system, it will be reliable and durable.

Another technology in the field of software related to 3D printers is a slicer or program to convert a three-dimensional model into a set of commands for a 3D printer. In this section, the command to determine the position where the concrete material in three-dimensional space (x, y, z) must be placed at the right time is compiled. This command must be set properly from the bottom layer by layer to the highest position to ensure the results obtained are in line with the desired expectations. Computers in this case can help the compilation process automatically and can even support simulations.

Developing 3D Printer Software Using the Rapid Application Development (RAD) Method,

Printer controller software was developed using the Rapid Application Development (RAD) method. This method is appropriate to be used in software development in this research because it allows to speed up the completion time and at the same time open the interaction space for all parties involved in an intense and incremental manner. Faster time is needed because technological developments in this field are very fast and interaction space between related parties is mandatory because it involves cross-study programs with different disciplines, although they are still closely related. The specifications of the printer controller software developed, based on the results of the requirements analysis stage (Luo et al., 2020), are as follows:

1. The software is able to control the printer to print flexibly, either automatically or point by point manually. This feature is very useful to support experiments related to the characteristics of materials and compositions to be used.
2. The software is able to control the printing process speed, can be programmed the time. This feature is also useful to support experiments related to the composition of mixtures of materials.
3. The software is capable of recording/documenting printing activities in the form of Documents, for example for subsequent processes such as repetition. This feature allows users to save, reopen, and make changes to documents.
4. For ease of operation, the software interface is made web-based via WiFi so that it supports laptops, tablets, and smartphones.

The features of the software developed in this research are: interactive web-based application, keypad and mobile android extension, save, edit, and simulation functions, and double print avoidance. The use case diagram is illustrated in Figure 5.

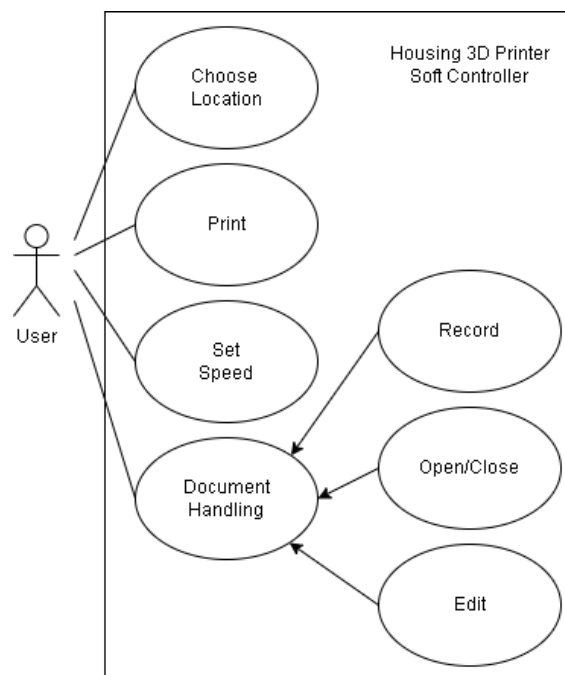


Figure 5. Use Case of 3D Printing Control Software for House Construction.

1. *Interactive, web-based application.* When doing experiments on concrete mix, not only the right composition that is needed but also how long should the mix be printed (delay time between dot and layer) in order to get optimum results. In this 3D printer controller software development, that problem is addressed. One of the main functions of this controller is to be able to control how long the print head (extruder) should be active. This depends on the concrete mix composition and its ingredient concentration or characteristics. This time parameter should be easy to adjust via the controller interface to save time and energy when doing the experiments. This 3D printer controller software is also equipped with web-based applications. Need to be able to position the printer head flexibly. Using keyboard control. Existing available software does not support it. Another important feature of the application is it supports 3D visualization of the printer head position and the progress of the object being printed. Using keyboard and mouse, users may choose different points of view, rotate the object, or turn it upside down. Combined with the flexibility to choose any location and adjustable time parameter, this will help the user get more insight about the experiment being conducted. This is very helpful to find the right concrete mix and optimum result.
2. *Keypad and mobile android extension (no visualization).* This web-based application is easy to develop further into a mobile application or minimum system application. By eliminating peripherals such as monitor, keyboard and mouse, the total investment needed drops significantly. In this setup, some features will not be available. For example, in the mobile version, the 3D visualization and control are not possible. Keyboard and/or mouse is replaced by a touchscreen (from smartphone or tablet). Or in the minimum system version, the display for visualization is gone completely and the control device is replaced by a keypad.
3. *Document handling:* save and edit
4. *Simulation.* One important feature of this app is the simulation of the printing process. Data is taken from a document which is an existing saved data.
5. *One way z axis (up only).* To avoid double printing (extrude concrete mix at the location that has already been printed before), the controller must be equipped with a mechanism to memorize/remember all locations' status. And also, since the printer must start to print from the bottom to the top (Z axis) only, the controller once goes up one layer, it could not go back to the previous layer below it.

Raspberry based motor control

1. The control from user through we based application is handled by JavaScript and converted to Python or C language for communication with the hardware.
2. ON/OFF instruction and its direction (clockwise/counter clockwise) for each motor are controlled by the program via Raspberry pin and motor driver module for safety and simplicity of the connection.
3. Timing is defined by default based on concrete mix material characteristic used in the process.
4. Motor connection uses 16 lines from Raspberry pins, Four lines for each motor (x, y, and z) and four lines for pump motor. At least 16 lines of Raspberry pin are used for this connection. The connection diagram is illustrated in Figure 6.

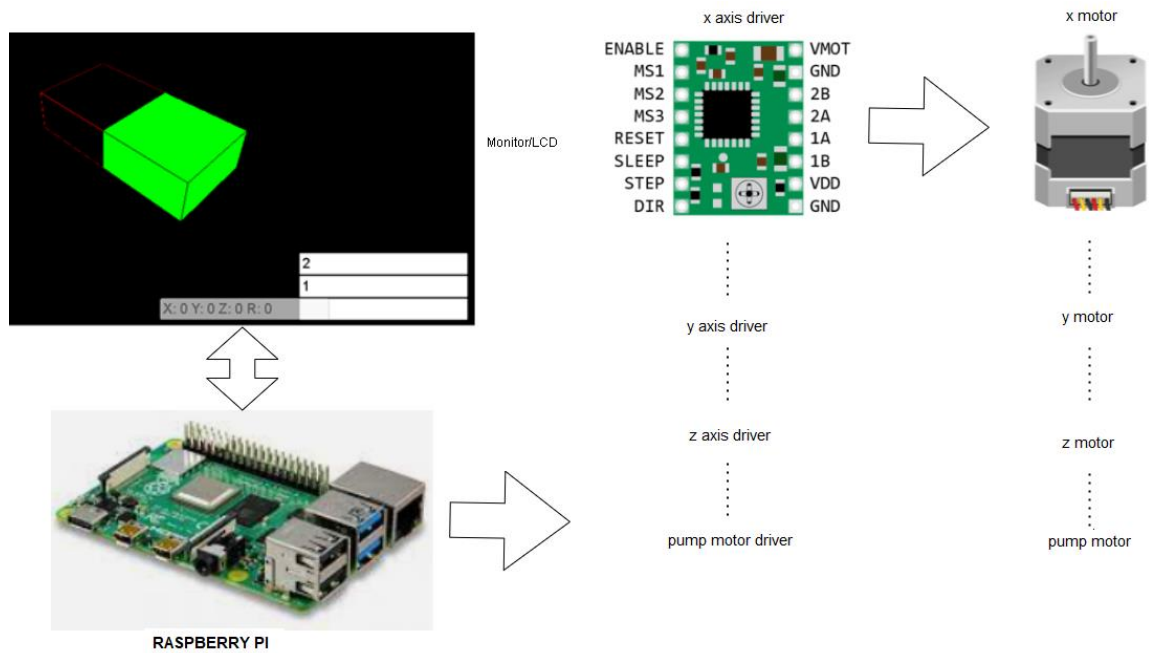


Figure 6. Raspberry Connectivity Diagram *Document Format*

The user instruction is handled by JavaScript that easily allow detection of button pressed by the user. Every button pressed by the user either for navigation or printing will be recorded in a file. An example of the file is shown in Figure 7.

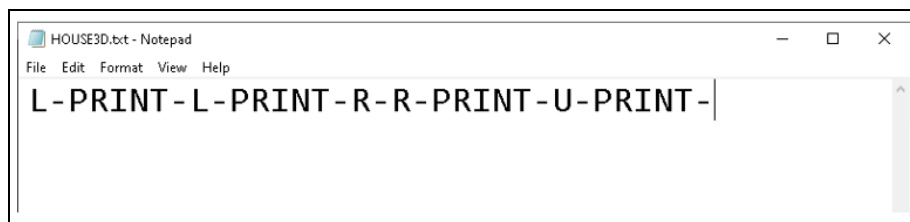


Figure 7. Example of Document Format

In this example, the user pressed 'A' key (move Left), space bar (Print), 'A' key (move Left), space bar (Print), 'D' key (move Right), 'D' key (move Right) again, space bar (Print), 'E' key (move Up), and space bar (Print). In every end of key pressed, a minus ('-') sign will be added as tags. The movement in left, right, and up direction can also be accomplished by pressing arrow keys.

The printer can also use autorun mode by reading the instruction from a saved file. The sample code of autorun shown in Figure 8 was developed using Python. The speed control code is also exhibited in Figure 9.

```
def auto_run():
    # Mapping serial dataIn values for speed control
    range_in_min = 0
    range_in_max = 100
    range_out_min = .003
    range_out_max = .0003

    ser.write("Running saved moves\n".encode())

    bluetoothserial = serial.Serial('/dev/rfcomm0',
                                    baudrate=9600, timeout=.0001)

    # replay loop starts here.
    while True:
        pwm.set_servo_pulsewidth(servo01, servo01Spos[0])
        sleep(.03)
        pwm.set_servo_pulsewidth(servo02, servo02Spos[0])
        sleep(.03)
        pwm.set_servo_pulsewidth(servo03, servo03Spos[0])
        sleep(.03)
        pwm.set_servo_pulsewidth(servo04, servo04Spos[0])
        sleep(.03)
        pwm.set_servo_pulsewidth(servo05, servo05Spos[0])
        sleep(.03)
        pwm.set_servo_pulsewidth(servo06, servo06Spos[0])
        sleep(.03)

        u = len(servo01Spos) - 2
        for i in range(u):
            dataIn = str(blueoothserial.readline())

            if servo01Spos[i] > servo01Spos[i+1]:
                j = servo01Spos[i]
                while j >= servo01Spos[i+1]:
                    data = str(blueoothserial.readline())
                    if data[2:-3] == 'PAUSE':
                        while data[2:-3] != 'RUN':
                            data = str(blueoothserial.readline())
                            if data[2:-3] == 'STOP':
                                ser.write("Manual Mode\n".encode())
                                return
                    j -= 1
                j = servo01Spos[i+1]
```

Figure 8. Autorun Code

```
# Speed control
if data[2:4] == 'ss' and len(data) > 3:
    Delay = float(data[4:-3])
    sSpeed[0] = (Delay - range_in_min) *\
                (range_out_max-range_out_min) /\
                (range_in_max-range_in_min) +\
                range_out_min
    pwm.set_servo_pulsewidth(servo01, j)
    j -= 1
    sleep(sSpeed[0])
```

Figure 9. Speed Control Code

Development of Concrete Mix

In general, concrete mixtures consist of cement, fine aggregate, coarse aggregate and water, but because the implementation uses a 3D printing machine, there are several things that need to be changed in the concrete mix composition. In this study, the fine aggregate was replaced with several materials derived from combustion waste such as husk ash from burning red bricks, fly ash from coal combustion from the nearest power plant, and micro-silica, while for coarse aggregate using an aggregate size of between 6 mm. The choice of aggregate size is due to the size of the nozzle tip of the planned prototype, which is 1 cm in diameter.

To obtain the mix design value from the planned concrete mixture, the team carried out SSD (Saturated Surface Dry) testing on fine aggregate and coarse aggregate, and the results of the test can be seen in table 1.

Tabel 1. Concrete Material Properties

Concrete material		
Cement density	3.15	gr/cm ³
Fine aggregate density, SSD	2.8	gr/cm ³
Coarse aggregate density, SSD	2.6	gr/cm ³
Water content of fine aggregate, SSD	1,70	%
Water content of fine aggregate, original	3.20	%
Water content of coarse aggregate, SSD	2.98	%
Water content of coarse aggregate, original	0.87	%
Slump	120	mm
Expected Compressive strength	17	MPa

Two kinds of concrete mix were used in the experiment based on the ration of fine aggregate and coarse aggregate, the first mix ratio is 30:70 and the second mix ratio is 15:85.

Table 2. Composition of Concrete Mix, Ratio of Fine to Coarse Aggregate 30:70 (Mix 1) and 15:85 (Mix 2)

Materials	Mix 1	Mix 2
	[Kg/m ³]	[Kg/m ³]
Cement	466.346	473.558
Fine aggregate:		
– Fly ash	264.190	131.191
– Rice Husk Ash	72.052	35.779
– Microsilica	144.104	71.559
Coarse aggregate	1120,808	1351,663
Water	253.765	265.768
Superplasticizer	5.179	5.424

The results of this mix design are then carried out in the process of making concrete to determine the workability of the concrete. The concrete is then printed using a cylinder with a diameter of 15 cm and a height of 30 cm, as exhibited in Figure 10. The purpose of making this concrete is to determine the strength of the concrete, namely by testing the compressive strength.



Figure 10. Concrete Specimen

Table 3. Compressive Strength of the Design Mix 1 and Design Mix 2

Age	Mix 1 [MPa]	Mix 2 [MPa]
3 days	4.525	5.091
7 days	5.374	9.091
14 days	8.485	15.555
28 days	9.616	17.628

The test results in Table 3 shows that the second design mix (15:85 ratio) has the compressive strength of the concrete according to the plan, namely the concrete as a retaining wall, which is above 17 MPa. In addition, the second design mix (15:85 ratio) is easier to process as it flows smoother from the pump nozzle and dry faster than the first mix, so the 15:85 composition will be used as the concrete mix in 3D printing process.

Conclusion

The prototype of concrete 3D Printer has been partially developed and tested. The assembly of 3D Printing machine is on progress and the controller software has been successfully tested. The concrete design mix has been developed with two different compositions of fine and coarse aggregates, namely 30:70 and 15:85 ratio of fine to coarse aggregates respectively. The second design mix exceed the compressive strength requirement (17 MPa), has a better flow through the nozzle and dry faster.

The next phase of development is finalizing the 3D printing machine assembly including the concrete pump, develop a slicer software, and testing the concrete mix to build a concrete construction sample. The slicer software is needed to convert a 3D model of a sample house or construction into several layers and output a G-

code, which is a set of instruction to move the nozzle to a desired position. So that, the printer will have two modes of operation: a teaching mode and slicer mode.

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Diversity and Inclusion: Incorporating History into the Mathematics Classroom

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Abstract: Math classes do not usually offer students an opportunity to learn about the diversity within the field of mathematics. As a result, students tend to hold inaccurate, negative perspectives about diversity in the world of mathematics and many may not feel a sense of belonging in the classroom when they do not see themselves reflected in the curriculum. The relationship between history and mathematics should be explored as one way to correct inaccurate views about what defines a mathematician and what the benefits are of studying mathematics and its relevance in daily life. One of the teaching practices that can support diversity and inclusion in the mathematics classroom is exposing students to a diverse group of mathematicians. In this study, we investigated the effects of using this teaching practice on creating an inclusive classroom. The participants in this study were 36 undergraduate students enrolled in a Precalculus course. Data were collected using a pre- and post-test tool and analyzed both quantitatively and qualitatively. An in-depth analysis through close comparisons between students' responses in the pre and post-tests. The results indicated that participants gained a new knowledge from the treatment (the historical projects) that expanded their horizons about mathematics diversity.

Keywords: Mathematics education, Mathematics history, Diversity & inclusion.

Introduction

Math classes do not usually offer students an opportunity to learn about the diversity within the field of mathematics. As a result, students tend to hold inaccurate, negative perspectives about diversity in the world of mathematics and many may not feel a sense of belonging in the classroom when they do not see themselves reflected in the curriculum. How can educational professionals establish appreciation for newly discovered mathematics when they are so far removed from earlier discoveries? How can educators overcome assumptions of irrelevance to social sciences and other fields in the college mathematics classrooms? One of the teaching

practices that can support diversity and inclusion in the mathematics classroom is exposing students to a diverse group of mathematicians.

There are countless ways to promote diversity and inclusion in the classroom. One way is the representation and incorporation of diverse groups from a variety of backgrounds. In this study, we look at incorporating history into mathematics curricula to help redirect misguided bias regarding the characteristics of mathematicians. This approach to promoting diversity and inclusion can lead to a positive, authentic shift in students' thinking about their own abilities to engage with mathematics. It can also lead to a relevant shift in students' thoughts about diversity within their communities. In this study, we start with the assumption that students enter the mathematics classrooms with biased views on matters of diversity. We also start with the assumption that learning mathematics is inherently interconnected with learning history. Our exploration begins by taking a closer look at these assumptions. Then, we examine perspectives that reject the incorporation of history into mathematics curricula followed by ideas that promote acceptance.

Do most students believe that history should be incorporated into mathematics courses? Many students seem to believe that history does not belong in the mathematics classroom. "I thought we were here to learn math," says a former student of Precalculus. "Can we focus on math?" Another student asks during the introduction of the project that incorporates history into their mathematics course. This demonstrates a negative perspective about historical content among students who seem to believe that history is not relevant when learning mathematics. Students may have been unintentionally taught that mathematics is an isolated field.

Literature Review

A measure of the sense of belonging in a mathematics community is a predictor of achievement and desire to pursue future studies across the sciences (Good, Rattan & Dweck, 2012). Students who perform well in mathematics courses often see themselves as mathematicians. Students who do not perform well in mathematics courses often do not see themselves as such. This inadvertently provides an advantage to people who belong to groups who are most frequently represented in the curriculum. Most students assume that mathematics has been discovered by European white males (Hobson, 2017). An honest account of history, however, may help provide a new, healthier viewpoint and lead students from all backgrounds to recognize themselves as scientists. History, as it is often taught, attributes mathematical discoveries to white male Europeans when in fact, the original mathematical ideas have been articulated by mathematicians from other ethnic and racial backgrounds (Irvine, 2020).

In using traditional mathematics textbooks, snippets of history about mathematicians might be found throughout the pages. However, these textbooks are written to pursue subject matter without genuinely pursuing the historical events or personalities that motivated them (Panagiotou, 2011). The negative beliefs about history and its relationship to mathematics can be presumed in other ways, as well. Panagiotou (2011) notes that authors are

also known to frequently leap to definitions of mathematical terms as an arbitrary occurrence rather than a response to a problem. Teachers also seem to believe that history and mathematics are barely related. They rarely address the historical material provided by the author. When they do address historical detail, they often do not deeply examine the influence of those ideas on current mathematics. They worry that instruction of history might distract students from learning fundamental principles of computation (Panasuk & Horton, 2013).

Although overwhelming evidence exists to urge the instruction of history in a mathematics classroom, studies show that most teachers do not believe on its impact on the learning of mathematics and therefore do not incorporate the practice into their lessons. Hobson (2017), suggested six strategies to support diversity and inclusion in the mathematics classroom. One of these strategies is exposing students to a diverse group of mathematicians by describing “mathematicians as multidimensional individuals with struggles, hobbies, and families”. For example, this can be done by presenting students with short biographies and showing them pictures of mathematicians from underrepresented groups. According to the National Council of Teachers of Mathematics (2000), one benefit of teaching history in a mathematics classroom is to inform students of their own abilities (Wilson & Chauvot, 2000). Students typically believe that mathematics is done by others, such as boys, the smartest students, and sometimes ethnic groups other than their own, rather than believing themselves to be mathematicians. These beliefs can span across race, gender, ability, and various categories of diversity.

Research shows that intense, targeted studies of the history of mathematics immediately and positively impacts learning by improving student attitudes about studying mathematics (Butuner, 2015). Additionally, students often report increased interest in subject matter in a mathematics classroom when the history is taught concurrently with theories about numbers (Goktepe & Ozdemir, 2013). Many educators teach that mathematicians are white male introverts. Many believe that the study of history has no direct relevance to the study of mathematics. This is demonstrated in textbooks and in attitudes of textbook authors, teachers, and students. However, there remain educators and influencers who hold positive perspectives about the relationship between history and mathematics and they bring novel ideas to the classroom.

Research Questions

This study aims at answering the following question: What are the effects of exposing students to a diverse group of mathematicians on supporting diversity and inclusion in the mathematics classroom?

Method

The participants in this study were 36 undergraduate students enrolled in a Precalculus class at Arizona State University in Fall 2021. The class was taught by one of the researchers. Students were enrolled in the class by regular registration procedures and were asked to volunteer to participate in the study. Students were informed that no private data will be collected, and that confidentiality is granted. Data were collected using a pre- and

post-test tool, the researchers administered the pretest during the second week of Fall 2021 and then they administered the posttest during the tenth week of Fall 2021 after the students had completed the required historical projects and gave related presentations in the classroom. The pre- and post-test items were developed by the researchers based on the aim of the study. From the 36 students who participated in the pretest, only 27 participated in the posttest. The items in both the pretest and posttest were exactly the same. The items were divided into two parts: the first part consisted of six multiple choice questions and the second part consisted of 7 open-ended questions.

Procedure

Participants in this study completed a project about a selected mathematician and gave a presentation during the semester as follows:

- Participants completed a pre-test to measure their perspectives on diversity in mathematics.
- Students were given an overview of project expectations.
- The instructor divided the classroom into random groups.
- Students worked independently and collaboratively with their group members outside of class to explore requirements, conduct research, and complete projects.
- Students used limited classroom time to work on their assigned projects and ask the instructor any questions related to their project.
- Students uploaded the final project presentation documents.
- Students delivered oral presentations during class time, on a scheduled date (in order of relevance to course content).
- Participants completed a post-test to measure their perspectives on diversity in mathematics.

Analysis

The collected data were analyzed both quantitatively and qualitatively. An in-depth analysis through close comparisons between the participants' responses in the pre- and post-tests were conducted. For the qualitative data, a color-coding scheme was used to analyze participants' responses. Data were organized in categories based on participants' responses. The objective of the data analysis was to compare between participants' responses in the pre- and post-treatment (completing the mathematics history projects).

Results and Discussion

In analyzing the responses collected from the pre-and post-test items, the items were divided into three parts: the first part focused on the first six multiple choice questions, the second part focused on the next five questions which asked participants to mention three things they knew about a particular mathematician, and the third part focused on the last two questions which asked participants to provide answers to the following: Which

population(s) come to mind when you think of people who are best in math? and Which population(s) come to mind when you think of people who are not good in math? For the first part of the pre- and post-test questions, the six multiple choice questions, the percentage of correct responses was calculated for each question (see Table 1). As can be seen from Table 1, the percentages of correct responses in the posttest improved in comparison to the pretest. For Question 3, the percentage increased from 27.8% to 81.5%

Table 1. Percentages of Correct Responses of each Question

Question	Pretest	Posttest
Q1: Algebra is named in honor of a mathematician from	58.3	85.2
Q2: The mathematician Leonhard Euler was	2.8	14.8
Q3: The mathematician Srinivasa Ramanujan was	27.8	55.6
Q4: Then “Man Who Knew Infinity” was from	27.8	81.5
Q5: The mathematician Evariste Galois died at age	8.3	40.7
Q6: The word <i>Algebra</i> comes from the following language	75	85.2

To have a better understanding of participants’ total correct responses, the percentages of the total number of correct percentages was calculated (see Table 2). As Table 2 indicates, 29.6% of the participants were able to provide at least 5 correct responses after the treatment, while none of the participants was able to provide any correct response for at least five questions in the pretest. Also, the percentage of participants who were not able to provide any correct response decreased from 13.9% to 3.7%, which indicates that the participants gained new knowledge regarding the six topics that were covered within the historical class presentations (see Table 2). For the second part in which participants were asked to mention three pieces of information that they knew about a particular mathematician, data were organized based on participants’ responses and percentages were calculated to compare between pretest and posttest responses for each mathematician.

Table 2. Percentages of the Number of Correct Responses

Number of correct responses	Pretest	Posttest
0	13.9	3.7
1	13.9	0
2	41.7	11.1
3	16.7	22.2
4	13.9	33.3
5	0	25.9
6	0	3.7

The percentages of participants who were not able to mention anything about a particular mathematician went down (see Table 3). For example, in Galois case, it went down from 100% (participants did not know anything

about him) to 55.56%, which means that almost half of the participants were able to mention at least one piece of information about him after the treatment (completing the project and class presentations). There were similar improvements for almost all the other four mathematicians.

Table 3. Percentages of Participants Mentioning Anything about a Mathematician

	Mentioned at least one thing		Mentioned nothing (no answer)	
	Pre-test	Post-test	Pre-test	Post-test
Al-Khwarizmi	13.89	55.56	86.11	44.44
Ramanujan	16.67	40.74	83.33	59.26
Galois	0	44.44	100	55.56
Germain	13.89	62.96	86.11	37.04
Euler	5.56	25.93	94.44	74.07

In addition, Table 4, lists the pieces of information that the participants gave about each mathematician and it shows how student responses advanced in comparison between the pre-treatment and post-treatment responses. As can be seen in Table 4, participants were able to list three different pieces of information about Galois in the posttest vs not listing any information at all in the pretest. In the case of Al-Khwarizmi, participants' listed responses increased from two to five. Similar results can be seen for the other mathematicians. This indicates that participants gained a new knowledge from the treatment (the historical projects) that expanded their horizons about mathematics diversity.

Table 4. Information Listed by the Participants about each Mathematician

	Pre-test	Post-test
Al-Khwarizmi	<i>Man, Middle East</i>	<i>Man, Middle East, Father of Algebra, India, Spoke Arabic.</i>
Ramanujan	<i>Woman, India, Vegetarian</i>	<i>Woman, India, Vegetarian, Poor, Infinity.</i>
Galois		<i>Died early, Europe, Never completed a university.</i>
Germain	<i>Female, Europe</i>	<i>Female, Europe, Publiised under a male name.</i>
Euler	<i>Man, UK</i>	<i>Man, UK, Europe, Blind, Deaf, Graph theory.</i>

In regards to the last two open-ended questions: Which population(s) come to mind when you think of people who are best in math? and Which population(s) come to mind when you think of people who are not good in math? student's responses were categorized into the following seven categories: African, American (including USA), Asian (including China & Japan), Europe (including UK, France, Germany), Indian, Middle Eastern (including Arabs), and Other/No answer (including general categories such as Engineers, chemists, doctors, and journalists). The majority of students agreed in both the pre-test and post- test that Asian were the best at math while Americans were not.

Table 5. Percentages of Participants' Perception of Populations' Math Ability

	Best in math		Not good in math	
	Pretest	Posttest	Pretest	Posttest
African	5.6	0	5.6	3.7
American	0	0	27.8	33.3
Asian	44.4	40.7	0	0
Europe	13.9	7.4	5.6	7.4
Indian	11.1	22.2	0	0
Middle Eastern	5.6	7.4	0	0
Other-No answer	19.4	22.3	61.1	44.4

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Emerging Trends in Biometric Authentication

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Abstract: With the growth in science and technology, risk to one's information and security has increased. To protect one's information, personal identification techniques are used for example passwords and ID cards. Still, passwords could be predicted or forgotten, and cards may get stolen. To resolve this and for better security, biometric technology was introduced in place of passwords and ID cards. Biometrics means to study human features or characteristics for authentication and various security purposes. Biometric Authentication is a process which depends on the unique biological characteristics of an individual. Palm Vein recognition is the biometric authentication method. A palm vein scanner uses near-infrared light wave to capture the vein pattern. Palm vein technology is a contactless biometric authentication method. It uses vein pattern of an individual's palm as personal identification data. It is one of the vascular pattern authentication technologies. Vascular pattern authentication uses vein pattern authentication using the vein patterns of the palm, fingers, back of the hand. Palm vein pattern is unique to every individual even to identical twins. Palm vein technology has a wide range of applications in many fields such as financial, healthcare, access control, airport facilities and even educational facilities.

Keywords: Authentication, Biometrics, Palm vein, Pattern recognition

Introduction

Biometrics means to study human features or characteristics for authentication and various security purposes. It is a mix of two Greek words i.e., bios-life and metrics-means to measure. A broader definition of biometrics would be that it is the biological and behavioral features of a person from which its unique characteristic can be extracted for identification. Biometrics was first introduced in law to recognize criminals. But now it is also extensively being used in many applications for individual identification and security. There are two types of biometrics i.e., physical biometrics and behavioral biometrics. The former is the physical characteristics such as fingerprints, shape of the hand, eyes, face, veins, etc. The latter is the behavioral features such as the movement of an individual i.e., when the person walk, speak, type or sign. In biometric authentication, an individual's features or habits are registered in a database and then compare it with others who may try to access the

account. If the user is legitimate access is granted or else the access would be denied. The physiological and behavioral characteristics of an individual can be considered as a biometric feature if it fulfills the following conditions:

Universality: Every person should be having the feature.

Distinctiveness: The feature should be unique to every

Permanence: The feature should remain unchanged over a time.

Collectability: The feature should be able to be calculated quantitatively

Other than these conditions, when you consider a practical biometric system, there are other issues that needs

to be taken into account which are the following:

Performance: It refers to the attainable accuracy and speed of the system, the resources needed to achieve that

and also, external factors that affect the speed and accuracy

Acceptability: It refers to what extent an individual would be ready to accept this system in their everyday life.

Circumvention: It refers to how well the system can be fooled by using fraud methods

A biometric system can be created using four modules mentioned below. Sensor Module: It is any type of sensor which obtains the biometric data of a person. For examples, a palm vein sensor that captures the vein patterns of an individual's palm. Feature extraction module: The captured data is processed to extract noticeable features. For example, in palm vein extraction after the absorption of infrared light, the palm vein pattern appears as black lines which is extracted. Matcher module: Here the extracted feature template is compared against the already stored template in the database to check if its matching. System database module: This module is used by the biometric systems to store the extracted template of the registered user in the database. False accept rate (FAR) and false match rate (FMR) It is the possibility that the biometric system wrongly matches the pattern to a non – matching template stored in the database. reject rate (FRR) and false non – match rate (FNMR) It is the possibility that the biometric system fails to match the pattern to a matching template stored in the database False.

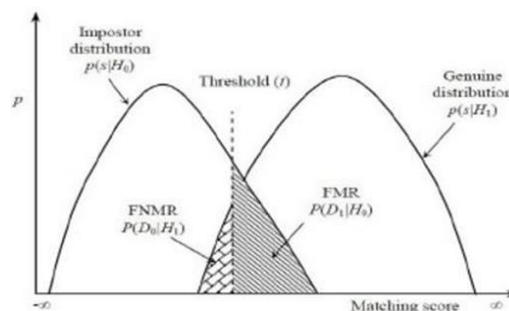


Figure 1. FMR & FNMR for Given Threshold

The biometric system is measured by the threshold t : Biometric samples which has a value higher than or equal to threshold value is said to be matching and value less than the threshold is said to be non – matching. The score distribution for the matching individual is called genuine distribution and for non – matching individual is called imposter distribution.

Relative Operating Characteristic (ROC):

The system performance at the threshold point can be showed in the form of ROC curve. Figure 1.2. shows the ROC curve. The false acceptance rate and the false rejection rate in biometric systems can be traded off against each other by changing the parameters. The ROC plot is attained by graphing the values of FAR and FRR, by changing its values completely.

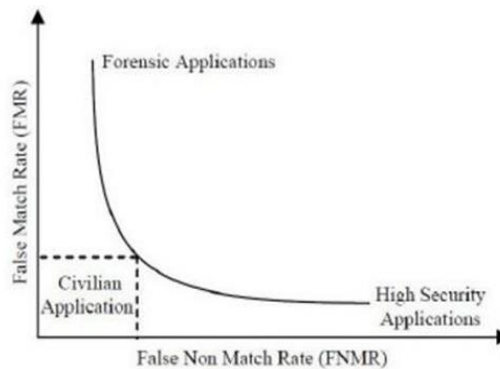


Figure 2. Curve Represents the ROC at different thresholds

Equal error rate (ERR):

It is obtained from the ROC graph by taking the point where FAR and FRR have the same value. The lower the ERR, the more accurate the system is. The ERR is commonly used for quick comparison of two systems.

Failure to enroll rate:

Failure to enroll occurs when information obtained by the sensor is not valid or if the quality is poor.

Failure to capture rate:

The probability that the system fails to capture the biometric system when obtained correctly is called failure to capture rate.

Template capacity:

It refers to maximum amount of data that can be inputted into the system (Jain, Bolle & Pankanti, 1999).

Classification of biometrics

Fingerprint Recognition

It is the most well known and most commonly used biometric technology. In this method, each fingerprint has ridges in the skin which can be visible. In every fingerprint, there are areas where a ridge changes and these

points of change is known as minutia. A fingerprint scanner detects the larger ridge and registers the information about the minutia.

Advantages:

This method has very high accuracy It is one of the most developed methods. User friendly. Requires small storage space.

Disadvantage:

The system can make mistakes because of the dryness or if the finger skin is dirty, also with age. Fingerprints are not very private. We leave fingerprints everywhere (Jain, Ross & Prabhakar, 2004).

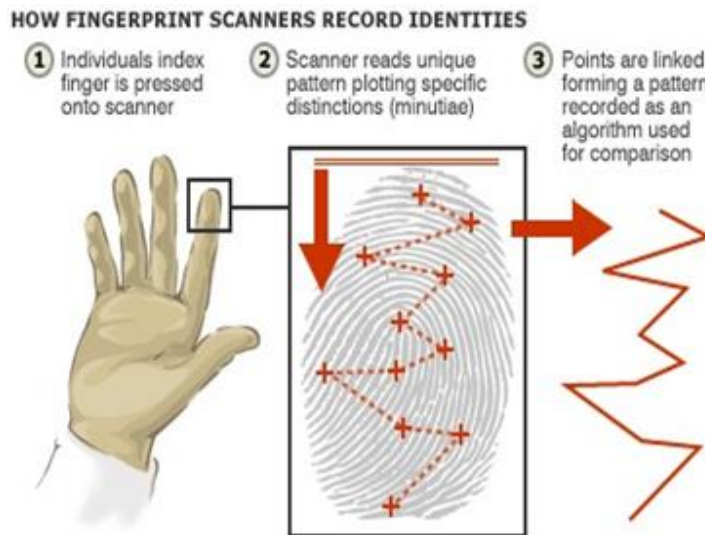


Figure 3. Fingerprint Pattern Extraction

Iris Scanning

In iris scanning, the colored circle surrounding the pupil is taken as the physical characteristic. The iris scanner will examine over 200 points of the iris such as, rings, furrows, corona.

Advantages:

It is easier to detect artificial irises Pattern of these irises cannot change by use of glasses or contact lenses.

Disadvantages:

The device used is very expensive

The person needs to stay still until the scanning is over (Jain, Ross & Prabhakar, 2004).

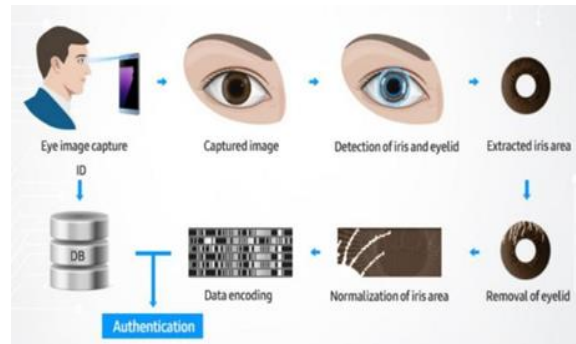


Figure 4. Iris Scanning Pattern Extraction

Face Recognition

In face recognition, an individual’s face is photographed, and this image is converted to digital code. It is captured as per the location and the shape of the facial traits such as eyes, lips, nose, eyebrows, etc.

Advantages:

An individual photograph can be taken from a distance. Even the person uses a mask, that can be detected if thermogram is used.

Disadvantages:

The main disadvantage is that the person who look alike can fool the system and also different poses can affect the process (Jain, Ross & Prabhakar, 2004).

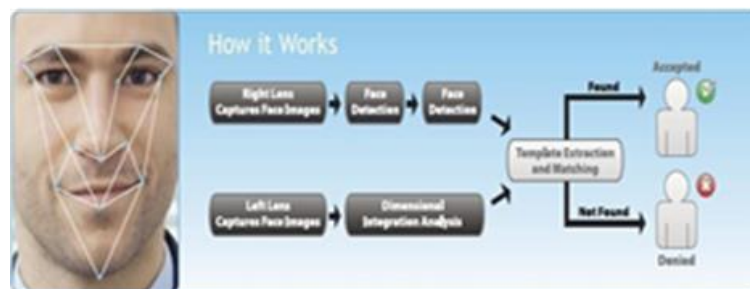


Figure 5. Working of face recognition

Palm Vein Technology

Palm vein technology is a contactless biometric authentication method. It uses vein pattern of an individual’s palm as personal identification data. It is one of the vascular pattern authentication technologies. Vascular pattern authentication uses vein pattern authentication using the vein patterns of the palm, fingers, back of the hand. Palm vein pattern is unique to every individual even to identical twins (Watanabe & Endoh, 2005). Vein pattern detection uses an infrared light source to scan for hemoglobin within the blood. Deoxidized hemoglobin

absorbs light at a wavelength of 760nm in the infrared region. When a palm is illuminated with near infrared light, the deoxidized hemoglobin in the palm vein absorbs this light causing the vein to appear as black pattern. In vein authentication based on this principle, the area used for authentication is photographed with near infrared light and the vein pattern is extracted by using image processing techniques and registered in the database (Watanabe & Endoh, 2005).

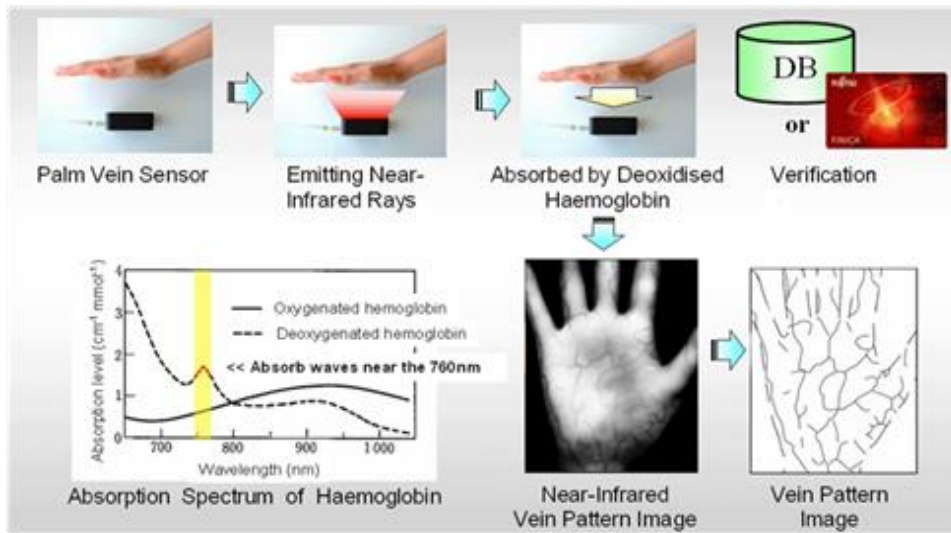


Figure 6. Absorption of Infrared Light

Working of Palm Vein Technology

The palm vein pattern of the person being authenticated and the palm vein pattern which is stored in the database is compared:

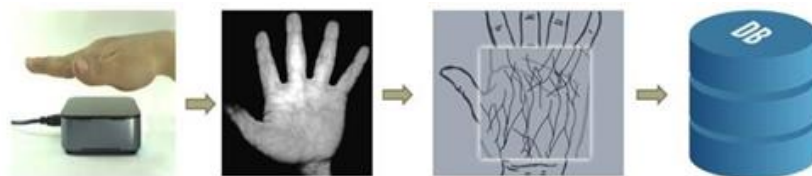


Figure 7. Working of Palm Vein Technology

As shown in Figure 7, the person’s hand is placed a few centimeters over the palm vein scanner, which is usually at 5-6 cm. The scanner then emits near infrared light as shown in Figure 3.2. The hemoglobin in the vein absorbs this near infrared light and the near infrared image is captured. This image is converted to digitized, encrypted data and it is stored in the database. The working of palm vein technology has two methods, registration and matching. Registrations is registering the palm vein of a new user into the database. While registering vein pattern of both the hands are registered so that if one template gets destroyed, the other is there. The matching process is comparing the user who needs to be authenticated with the registered template in the database.

General framework of vein recognition

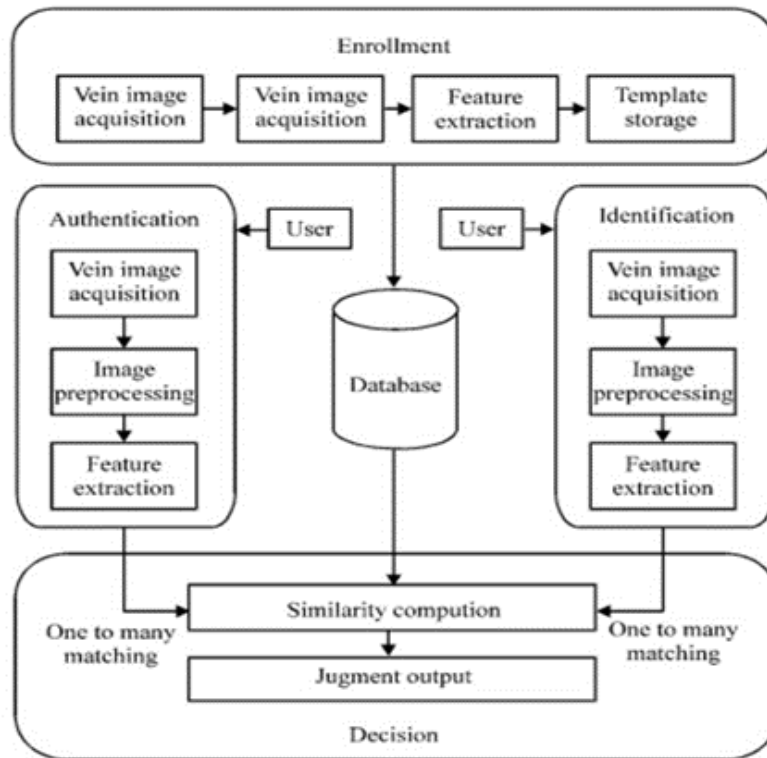


Figure 8. Architecture of vein recognition

The Figure 8 shows the architecture of vein recognition. It has four stages i.e., enrollment, authentication, identification and decision. The enrollment stage is called registration. It consists of vein image acquisition, image processing and feature extraction. Image acquisition is the action of retrieving an image from a source. Vein pattern is not easily seen in visible light and thus it is captured in two ways, a near infrared CCD sensitive camera, or an array of near infrared Light-Emitting Diode (LED). In general, several samples are captured. After the raw image is captured, it is preprocessed before feature extraction. In preprocessing, the sample is sent for image enhancement. Image enhancement is the process of adjusting digital images so that the results are suitable for display or further analysis of image. In feature extraction, the vein pattern to be extracted is represented as black lines. To extract the lines, edge detection and morphological operators are usually used.

The authentication stage is called the verification stage. It is a one-to-one matching process. For a specific user, the vein image must be captured, preprocessed, feature extracted and transformed into a feature vector as per the mechanism planned. The operations of identification stage are like the authentication stage. It is a one-to-many matching processes. The decision stage is feature matching. It computes the resemblance between the feature template and the matching part read out from the database one by one. The user can be confirmed as a person whose vein feature data have the maximum similarity score (Luo at al., 2010).

Palm vein extraction

For image – based biometric systems, certain preprocessing steps are essential to enhance the quality of the image like brightness, contrast, removal of noise, image sharpening, etc. - to produce a better-quality image.

Three required preprocessing tasks are proposed below:

1. Vascular pattern marker algorithm
2. Vascular pattern extraction algorithm
3. Vascular pattern thinning algorithm (Sudha at al., 2015).

Vascular Pattern maker algorithm

Step 1: Open the infrared image of the palm in input mode.

Step 2: The loaded image is converted to planar image.

Step 3: The horizontal and vertical kernels (3x3) are set, respectively as follows:

Step 4: The planar image obtained in Step 2, is passed through the kernels in Step 3 (Sudha at al., 2015).

Vascular Pattern extraction algorithm

Step 1: The resultant grayscale image obtained in vascular pattern marker algorithm is opened in input mode.

Step 2: The binary image file in output mode c is opened.

While not end of file

Step 3: Loop

Step 4: Read pixel intensity value.

If pixel intensity value lies in between 20 and 130, then go to step 5.

Step 5: Convert the intensity value to 0 i.e., black.

Step 6: Else Go to Step 7.

Step 7: Modified fine-grained planar image is stored into another greyscale image file. Close all image files.

Step 8: Convert the intensity value to 255 i.e., white

Step 9: End if

Step 10: Write the intensity value to Binary Image 1.

End Loop

Step 11: Close all image files.

Thresholding: It is an image processing method used for converting a greyscale or a color image to a binary image based upon its threshold value.

If the pixel in the image has intensity value less than the threshold value, the pixel in the resultant image is set to black. Or the pixel value is set to white. Therefore, creating a binarized image with black (0) and white (255).

Thresholding is used for getting rid of noise (Sudha at al., 2015).

Vascular Pattern Thinning Algorithm

Step 1: The resultant binary image obtained in the vascular pattern extraction algorithm is opened in input mode.

Step 2: Each pixel intensity value is read and stored into a corresponding location of a 2D matrix.

Step 3: Matrix processing as following steps:

```
int rows = Image Width, columns = Image Height;
for(int i = 0; i < rows; ++i)
{
for(int j = 0; j < columns; ++j)
{
if((i==0) || (j==0) || (i==(rows-1)) || (j==(columns-1)))
matrix[i][j] = -1;
}
}
for(int r = 1; r < rows-1; r++)
{
for(int c = 1; c < columns-1; c++)
{
if((matrix[r][c] != -1))
{
if (((matrix[r][c+1] != -1) || (matrix[r][c-1] != -1))
&&((matrix[r+1][c] != -1) || (matrix[r-1][c] != -1)))
{
matrix[r][c] = -1 ;
}
}
}
}
for(int r = 1; r < rows-1; r++)
{
for(int c = 1; c < columns-1; c++)
{
if((matrix[r][c] != -1))
{
if(((matrix[r][c-1] == -1) && ((matrix[r][c+1] == -1)))
{
if(((matrix[r-1][c] == -1) && ((matrix[r+1][c] == -1)))
{
```

```
matrix[r][c] = -1;
}}}}
```

Step 4: Write the 2D matrix into a binary image file.

Close all image files. The obtained binary image is stored in the database. For every individual, one or more multiple images are required to be stored. Thinning is done for capturing the vascular pattern of hand palm of an individual (Sudha at al., 2015).

Applications

Palm Vein Technology in ATM

In most ATM's we find the client inserting a plastic smart card which has a chip that has a novel card number. The user is given a PIN number for security. But even then, we find fraudulent activities happening. To increase the security, palm vein technology is introduced in ATM machines. The individual's palm vein becomes the chip in the smart cards. Vein recognition is a more secure biometric method when you compare with other biometric methods. As the vein is internal to the body it is not possible to forge and thus more secure. At first, the user's unique identification number (UIN) and palm vein samples is collected using a palm vein scanner at the time of first opening the accounts. The extracted palm vein images are normalized, which is taken as enrolled data in a database. This procedure is shown in Figure 9

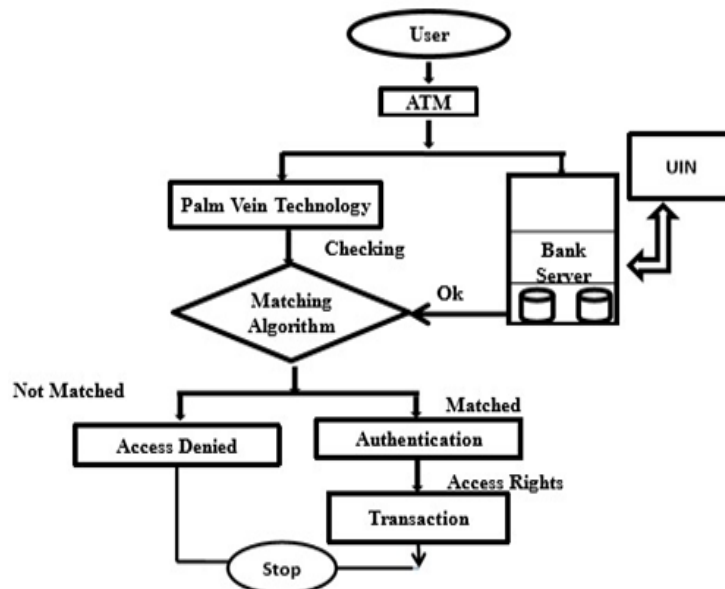


Figure 9. Flowchart of proposed ATM

When a user is accessing the transactions, the user places his palm over the scanner which is appended to the machine and the captured vein image is compared with the registered data. If there is a match, it is linked to the CDIR repository. Its again checked if the user is the one who he is saying or not. If both matches, the user can

perform transactions. There are 2 methods while dealing with biometrics to perform ATM transactions as shown in Figure 10.

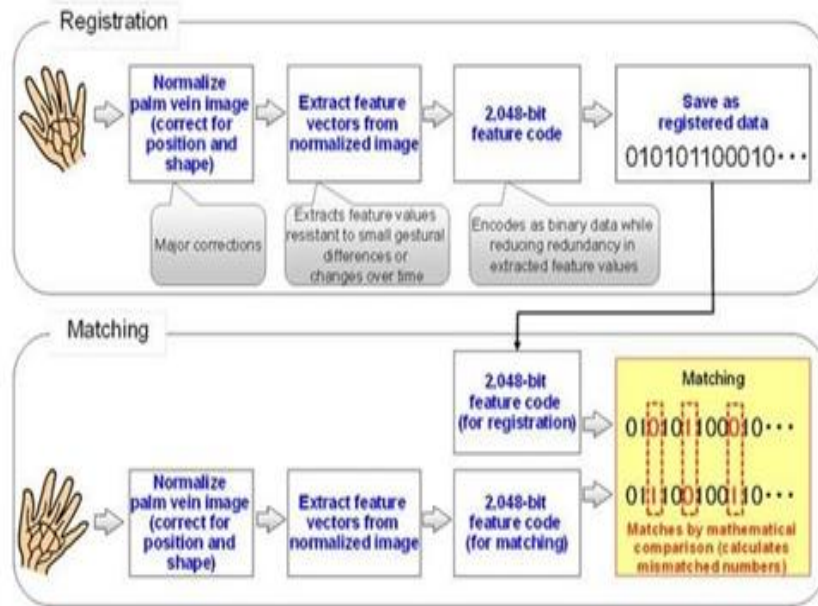


Figure 10. Enrollment to Palm Vein Sample

Vein authentication can provide two types of systems for ATM depending on where the registered vein pattern is stored. In one method, the vein pattern is stored on the server of a client-server system. In other type, the user’s vein pattern can be stored on an IC card (Prasanthi, 2015).

Palm Vein in Access Control

The palm vein access can be used to control entry and exit for rooms and buildings. It combines the operation and control sections. The palm vein sensor is a part of operation sensor. The control section performs authentication process and issues orders to unlock the door. Simple configuration is introduced in this system by connecting it to the controller of an electronic lock. The palm vein technology is implemented where its used to control access to places containing systems or machines such as machine rooms in companies and outsourcing center where valuable information is kept. Figure 11 shows COSEC door interface used in access control. It supports card, palm vein scanner and PIN. Palm vein technology provides high security for access control and since it is a contactless method it is hygienic

COSEC DOOR PVR Interfaces



Figure 11. COSEC Door PVR Interface

Advantages & disadvantages

Advantages

Completely contactless design minimizes hygiene concerns and psychological resistance:

High authentication accuracy: Fujitsu, a leading company in Japan, is an originator in designing a completely contactless palm vein authentication device. Using the information of 140,000 palms from 70,000 individuals, Fujitsu confirmed that the system has a false acceptance rate (FAR) of less than 0.00008% and a false rejection rate (FRR) of 0.01%, if the hand is kept over the device three times during registration, with one retry for comparison during authentication.

Furthermore, the device’s ability to accomplish personal authentication was verified using the following: Data from people ranging from 5 to 85 years old, including people in various occupations. Data about foreigners living in Japan Data taken in various situations in daily life, including after drinking alcohol, taking a bath, going outside, and waking up (Fujitsu Comput., 2006)

Disadvantages

There are many factors that will affect the quality of the captured image. They are body temperature, humidity, radiation, camera focus and calibration. Palm vein technology is invasive i.e., it creates a fear among people that it is a painful process. It is not applicable for people who lost their palm. The technology has not yet been marketed globally.

Conclusion


Palm vein technology has a wide range of applications in many fields such as financial, healthcare, access control, airport facilities and even educational facilities. Fujitsu a leading company in Japan has introduced many products in palm vein technology which will help in the advancement of this technology. Fujitsu has developed Palm Secure portable sensor that can be easily integrated into customer products. Fujitsu has also introduced Palm Secure Software. Development Kit (SDK). SDK allows you to develop your own solution using the Fujitsu Palm Secure products. It includes source code for sample applications and tools that you can modify or adopt as needed. The SDK includes Palm Secure sensor, drivers, application key and much more.

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Examination of Text-Based Questions in Secondary School Turkish Textbooks According to the Renovated Bloom Taxonomy

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Abstract: In this study, it is aimed to examine the text-based questions in the secondary school Turkish textbooks according to the revised Bloom's Taxonomy and to evaluate these questions according to the cognitive domain steps. In the research, the text-based questions in the Turkish textbooks approved by the Ministry of National Education were examined by document analysis method, and a separate analysis was made for each grade level. As a result of the study, it was seen that the text-based questions in Turkish textbooks concentrated on the steps of remembering and understanding. It is noteworthy that in the fifth, sixth and seventh grade Turkish textbooks, the questions that serve high-level thinking skills have lower rates than the questions of other skills. This situation differs only in the textbook for the eighth-grade level. The variation in the number of questions at all grade levels and in all themes at these levels reveals the unplannedness in the textbooks. The research reveals that it is necessary to develop high-level thinking skills of students at the secondary school level and to support this goal with textbooks, which are the most used teaching materials in education.

Keywords: Renewed Bloom Taxonomy, Textbook, Text-based questions

Introduction

Proper use of language is the main objective language education. However, in recent years, the objective of raising students who can think critically and creatively has become prominent. Correct thinking, correct understanding and correct use of language can only be fully achieved with the development of critical thinking education. (Karadüz, 2010). The constructivist approach, which has a significant part in today's education, reveals high-level thinking skills. The conceptual framework formed with the constructivist theory has activated the students in learning and leded new assessment applications by affecting learning process and assessment approaches after (Yurdabakan, 2012). In this approach, the objective is human qualification generating new information and using the information, not the one who stores it. In Turkish education curriculum, it has been stated that along with the basic skills, students should acquire critical thinking, creative thinking, problem solving, researching and decision-making skills (MEB, 2006). With this understanding, it is important to determine to what extend students have these skills in Turkish lessons taught to improve students' high-level mental skills (Çintaş Yıldız, 2015). One of the most important materials of the Turkish course is the texts used

in the course. The teacher is a very affective factor in the students' understanding of the texts discussed in these courses in the best way possible. Because the teacher is the person who can improve the thinking skills along with the comprehension and expression skills by arousing the attention of the students (Eyüp, 2012).

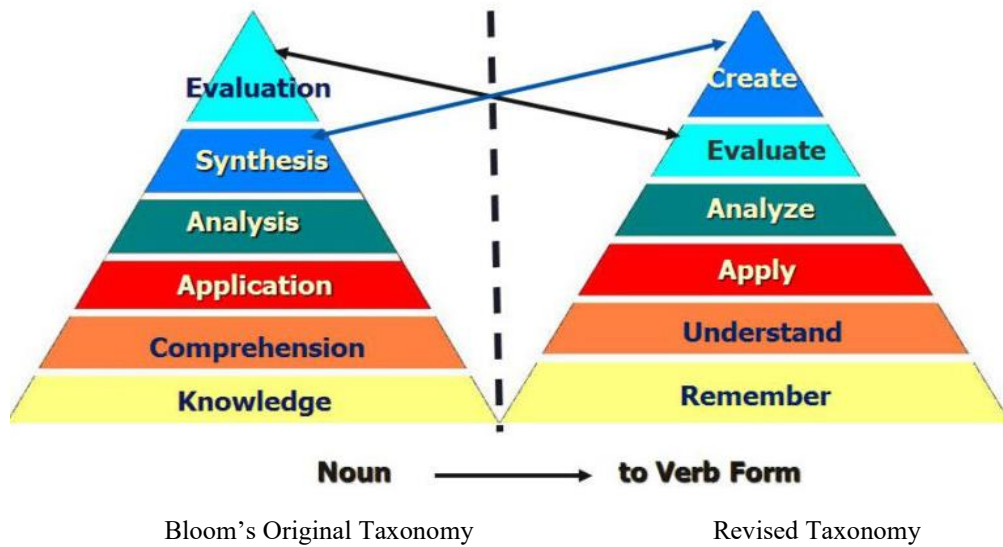
The questions to be asked by the teacher after the text is read, should improve students' skills of thinking, criticizing, making critical, developing evidence and motivate them to learn (İşman & Eskicumalı, 2001). Because asking questions is method that activates thinking (Sara Kuzu, 2013) and learning may not be completely mentioned in an environment where there is no thinking. Allen and Tanner (2002), stated that the questions should not only measure what students have learned, but also improve their thinking skills. In this regard, the questions which are the most important elements in assessment and evaluation in the education and training process, are prepared mostly according to Bloom's taxonomy in compliance with the learning approaches of our age. According to Thompson (2008), the exam questions for students at the present time are also classified according to Bloom's taxonomy which is universally accepted.

Completed in 1956 and published in a book, Bloom's taxonomy of cognitive domain consists of six categories. There is a hierarchical structure among these categories from simple to complex. Knowledge is considered the lowest level of the cognitive domain and is respectively followed by the levels of comprehension, application, analysis, synthesis and evaluation. Each lower category is the prerequisite for the next higher category (Ari, 2011). In this classification, where knowledge, comprehension and application are considered as lower order thinking skills; analysis, synthesis and evaluation are expressed as higher order thinking skills (Gündüz, 2009). Since 1956, when Bloom's taxonomy emerged, improvements in developmental and learning psychology, teaching methods and techniques, assessment and evaluation have necessitated the reorganization of learning and learning objectives (Başbay, 2007). This taxonomy, which has been criticized for various reasons, was revised in 2001 with some alterations (Bümen, 2006). In 1990s, David Krathwohl, one of the authors of the original taxonomy, and Lorin Anderson, one of Bloom's students, took action to reorganize the existing taxonomy to meet the necessities of our age (Anderson, Krathwohl et al., 2001, as cited in Altındağ & Demirel, 2013).

In the new classification, the cognitive domain has been handled in two dimensions as content and process. As in the original classification, the dimensions of cognitive process in the revised one, consist of six main categories in a hierarchy from simple to complex (Eroğlu & Sara Kuzu, 2014). On the other hand, in the revised taxonomy, "Each lower category is the prerequisite for the next higher category" principle has been removed (Ari, 2011). The most significant change has been realized in the dimension of knowledge and this dimension has been explained in detail and has become an aspect that teachers can easily benefit from (Altındağ & Demirel, 2013). In addition, this dimension has been arranged from simple to complex supporting the infrastructure of the dimension of cognitive process and metacognitive knowledge category has been added to the dimension (Yurdabakan, 2012).

The verb structure of the knowledge category in the original taxonomy maintains to be in the first place with the

name of remembering in the revised taxonomy. Comprehension, the second category, has been changed to understanding. In this classification, while the categories of application, analysis and evaluation have kept their place, the synthesis category was replaced with the evaluation category and renamed as creating. Subcategories, which are stated as nouns in the original taxonomy, are stated in verb form in the revised taxonomy (Ari, 2011). The original and revised taxonomies are given below by comparison. It is known that the revised taxonomy, which is universally accepted, is also widely used in Türkiye. There are numerous applied studies on this taxonomy.



Purpose of the Study

In this study, it is purposed to examine the text-based questions in secondary school Turkish textbooks according to the revised Bloom's taxonomy and evaluate these questions according to cognitive domain levels. Within the scope of this purpose, answers to the following questions have been sought:

- 1.How is the distribution of the text-based questions in the fifth-grade Turkish textbook to the cognitive domain levels in the revised Bloom's taxonomy?
- 2.How is the distribution of the text-based questions in the sixth-grade Turkish textbook to the cognitive domain levels in the revised Bloom's taxonomy?
- 3.How is the distribution of the text-based questions in the seventh-grade Turkish textbook to the cognitive domain levels in the revised Bloom's taxonomy?
- 4.How is the distribution of the text-based questions in the eighth-grade Turkish textbook to the cognitive domain levels in the revised Bloom's taxonomy?
- 5.How is the distribution of the text-based questions in the Turkish textbooks of all grade levels to the cognitive domain levels in the revised Bloom's taxonomy?

Method

The method of the research is document analysis, one of the qualitative research methods. Document analysis is the analysis of written and visual materials containing information about the investigated phenomenon, event and situation (Yıldırım & Şimşek, 2005).

Data Collection Tools and Data Collection

The data of the study have been obtained from the Turkish textbooks taught in secondary schools in Türkiye in the 2021-2022 school year. Text-based questions in the textbooks have been investigated by three field experts and the data have been descriptively analyzed and tabulated.

Findings

In this section, the findings that emerged as a result of the investigation of the text-based questions in the examined Turkish textbooks have been included. Accordingly, the findings of the text-based questions regarding the cognitive domain levels in the revised Bloom's taxonomy are indicated below.

Table 1. The Distribution of Text-Based Questions in the Fifth Grade Turkish Textbooks to the Cognitive Domain Levels in the Revised Bloom's Taxonomy

Cognitive Domain	Themes								Total
	Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7	Theme 8	
Remembering	7	11	10	19	9	6	4	16	82
Understanding	2	-	5	1	5	5	2	5	39
Applying	-	1	1	-	1	-	1	2	6
Analyzing	2	2	3	3	2	1	3	1	17
Evaluating	3	1	5	1	4	5	2	2	23
Creating	-	-	1	1	-	2	5	2	11

When Table 1 is examined, it is seen that the text-based questions in the fifth-grade Turkish textbooks increase in the remembering and understanding levels. The levels at the lowest ratio are applying and creating. This applies to all themes. In general terms, it is remarkable that the questions related to high-level thinking skills have lower rates.

Table 2. The Distribution of Text-Based Questions in the Sixth Grade Turkish Textbooks to the Cognitive Domain Levels in the Revised Bloom's Taxonomy

Cognitive Domain	Themes								Total
	Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7	Theme 8	
Remembering	18	8	9	10	12	12	17	17	103
Understanding	5	7	5	2	4	4	2	1	30
Applying	-	1	-	-	-	-	-	-	1
Analyzing	1	-	-	-	-	-	-	-	1
Evaluating	1	5	2	1	4	1	1	1	16
Creating	-	-	-	4	-	-	-	-	4

When Table 2 is examined, it is seen that the text-based questions in the sixth-grade Turkish textbooks increase in the remembering and understanding levels. The levels at the lowest ratio are applying, analyzing and creating. It is detected that some themes do not contain the questions related to these levels. In general terms, it is remarkable that the questions related to high-level thinking skills have lower rates.

Table 3. The Distribution of Text-Based Questions in the Seventh Grade Turkish Textbooks to the Cognitive Domain Levels in the Revised Bloom's Taxonomy

Cognitive Domain	Themes								Total
	Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7	Theme 8	
Remembering	19	10	8	14	17	13	11	8	100
Understanding	6	5	4	4	3	4	6	10	64
Applying	-	-	-	-	-	-	-	-	0
Analyzing	-	3	3	-	-	1	-	-	7
Evaluating	-	-	-	-	-	-	-	-	0
Creating	2	2	-	-	2	-	3	-	9

When Table 3 is examined, it is seen that the text-based questions in the seventh-grade Turkish textbooks increase in the remembering and understanding levels. The levels at the lowest ratio are applying, analyzing and evaluating. It is detected that some themes do not contain the questions related to these levels. Especially, the questions regarding the applying and evaluating levels were not encountered in any of the themes. In general terms, it is remarkable that the questions related to high-level thinking skills have lower rates.

Table 4. The Distribution of Text-Based Questions in the Eighth Grade Turkish Textbooks to the Cognitive Domain Levels in the Revised Bloom's Taxonomy

Cognitive Domain	Themes								Total
	Theme 1	Theme 2	Theme 3	Theme 4	Theme 5	Theme 6	Theme 7	Theme 8	
Remembering	7	8	10	7	9	12	10	8	71
Understanding	6	4	2	5	4	6	4	5	36
Applying	2	-	2	-	1	2	1	-	8
Analyzing	3	1	-	-	-	2	-	3	9
Evaluating	9	3	5	7	5	9	9	8	55
Creating	1	5	5	4	4	2	-	3	24

When Table 4 is examined, it is seen that the text-based questions in the eighth-grade Turkish textbooks increase in the remembering and evaluating levels. The levels at the lowest ratio are applying and analyzing. It is detected that some themes do not contain the questions related to analyzing and creating levels. In general terms, it is noteworthy that there is a disorder in the distribution of the numbers of questions. While there are 8 questions in the applying level, there are 24 questions in creating level which is a high-level thinking skill, and alike, there are 36 questions in the understanding level, while there are 55 questions in the evaluating level which is a high-level thinking category, distinguish this grade level from other grade levels.

Table 5. The Distribution of Text-Based Questions in the Turkish Textbooks of All Grade Levels to the Cognitive Domain Levels in the Revised Bloom's Taxonomy

Cognitive Domain	No. of Questions	Percentage
Remembering	356	%50
Understanding	169	%24
Applying	15	%2
Analyzing	34	%4
Evaluating	94	%13
Creating	48	%7

When Table 5 is examined, it is seen that 50% of the text-based questions in the textbooks are in the remembering level. There are 356 questions in total at this level. It is respectively followed by the understanding level with 169 questions and 24% rate, evaluating level with 94 questions and 13% rate, creating level with 48 questions and 7% rate, analyzing level with 34 questions and 4% rate, and finally the applying level with 15 questions and 2% rate. It is noteworthy that the creating level, which is considered as a high-level thinking category, has a higher rate than the applying level. It can be said that text-based questions in Turkish textbooks increase in the remembering and understanding levels, but are insufficient in the applying and analyzing levels.

Conclusion

The main objective of the education systems must be to keep up with the world in constant change and development, not to fall behind the times, to provide students with high-level thinking skills to raise individuals who can express themselves better (Kalaycı, 2001). These targeted high-level thinking skills are included in the general objectives of the Primary School Turkish Course Curriculum (6th, 7th and 8th grades) as follows: “Improving understanding, sorting, relating, classifying, questioning, criticizing, estimating, making analysis-synthesis, interpreting and evaluating skills” (MEB, 2006). In order to develop high-level thinking processes, the cognitive domain classification made by Bloom in 1956 is frequently used (Sönmez, 2007).

In this study, text-based questions in secondary school Turkish textbooks have been examined according to the revised Bloom’s Taxonomy and these questions have been evaluated according to the cognitive domain levels. As a result of the study, it is seen that the text-based questions in Turkish textbooks increase in the remembering and understanding levels. It is noteworthy that the questions related to high-level thinking skills in Turkish textbooks of fifth, sixth and seventh grade levels have lower rates. This case differs only in the eighth-grade textbook. While there are 8 questions in the applying level of this grade level, there are 24 questions in creating level which is a high-level thinking skill, and alike, there are 36 questions in the understanding level, while there are 55 questions in the evaluating level which is a high-level thinking category, distinguish this grade level from other grade levels. The variation in the number of questions in all grade levels and all themes in these levels, reveals the disorganization in the textbooks.

Durukan and Demir (2017), as a result of their study named “Classifying the Activities in Turkish Lesson Textbook for the 6th, 7th and 8th Grades Students According to the Revised Bloom’s Taxonomy”, detected that the distribution of activities regarding the four basic skills to the taxonomy is not proportional, and the activities are more likely to increase in the remembering and understanding levels which are the first two levels of the taxonomy. In this study, it is concluded that the number of the activities regarding the evaluating, analyzing and creating levels, which can be linked with critical thinking skill, is insufficient.

Yıldız (2015) examined Turkish course exam papers in her study, in which she analyzed Turkish Course exam questions according to the revised Bloom’s taxonomy. According to the result of the research, most of the questions in Turkish course exam papers are mainly in conceptual knowledge level in the dimension of knowledge; and understanding level in the dimension of cognitive process. Kavruk & Çeçen, 2013, as a result of their study in which they evaluated the Turkish course written exam questions in terms of cognitive domain levels, concluded that most of the questions are in the knowledge, comprehension and application levels which measure lower order information. Güftâ & Zorbaz (2008), in their study named “A Review Regarding Levels of Written Examination Questions for Turkish Courses of the Secondary School”, detected that the questions in Turkish course written exam are mostly low-level questions.

Kuzu (2013), in her study, in which she examined the text-based questions in Turkish textbooks according to the revised Bloom's Taxonomy in terms of the cognitive levels of remembering and understanding, detected that the rate of the questions of remembering level to the total number of questions is 36%, the questions of understanding level is 39%, the questions of other levels is 25%. Çiftçi & Çeçen (2009), in their study named "An Evaluation of Pre- and Post-Reading Questions in the 5th and 6th Grade Textbooks in Primary School in Terms of Bloom's Taxonomy", found out that the least successful level is the synthesis level, the most successful level is the evaluation level. Besides, understanding degrees in comprehension, application, analysis and synthesis levels had a significant difference according to gender. Similarly, Akyol (2001) in his study, where he analyzed questions related to the reading texts in the 5th grade Turkish textbooks in primary school, concluded that most of the questions led the students to memorization, and the questions that require thinking and criticizing such as evaluation and estimation are included just a little or not included at all. Kutlu (1999), found out that no questions were asked regarding the analysis and synthesis levels, in his study named "An Investigation of the Questions Prepared According to the Reading Texts in Turkish Course Textbooks Used in Primary Education".

Çiftçi (2010), in his study, in which he evaluated the reading comprehension achievements in primary school 5th grade Turkish education curriculum in terms of cognitive skills, stated that the cognitive levels are not evenly distributed in the achievements and the majority of the achievements were in the lower cognitive levels. Eyüp (2011) revealed that teacher candidates prepared questions mostly in "remembering" and "understanding" levels, and were unable to prepare questions to improve high-level thinking skills in her study named "Evaluation of the Questions Prepared by Turkish Language Teacher Candidates According to the Revised Bloom's Taxonomy". In Göçer (2008)'s study, titled as "Investigation of Primary School Turkish Textbooks in Terms of Assessment and Evaluation", one of the results was that the questions in the assessment and evaluation section at the end of the theme in the textbooks increase at the knowledge level of the cognitive domain.

The results of this study indicate that a significant part of the reading comprehension questions used in Turkish course can raise the student to some levels of the cognitive processes in Bloom's Taxonomy such as "remembering", "understanding" or "applying" at most; and yet, cannot activate high-level cognitive skills such as analyzing, evaluating and creating. Our research also reinforces these studies.

Thinking is the most important component of the process of acquiring knowledge, understanding and learning. Interrogation of the information forms the basis of the studies of evaluation and generation of new information. Additionally, solving the problems becomes a necessity by means of developing mental freedom and shaping the future (Güneş, 2012). Our research and other researches prove that there are deficiencies in our education system in learning and teaching high-level cognitive skills such as interrogation of the information, evaluation and generation of new information. The biggest objective of today's education is to raise individuals who can adapt to various conditions and think flexibly and clearly (Seferoğlu & Akbıyık, 2006). Therefore, the importance of the studies carried out to provide our students with high-level thinking skills is increasing day by day.

Recommendations

1. In order to activate students' high-level thinking skills, the achievements in Turkish education curriculum should be properly distributed to the cognitive levels.
2. Teachers and teacher candidates; should be trained about providing students with high-level thinking skills, and the number of the in-class activities serving this purpose should be increased.
3. In Turkish textbooks, texts that are attention-grabbing and open to creative ideas, suitable for the student's levels and areas of interests should be taught instead of long and boring texts that contain only information.
4. The text-based questions in Turkish course textbooks should be separated from the 5W1H framework, and prepared to serve all of the cognitive levels.
5. In accordance with all these studies, Turkish course exam questions should be appropriate to the cognitive levels and as qualitative as to improve the students' high-level thinking skills.


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Should the Governments Promote or Control Development in Machine Learning and Artificial Intelligence AI?

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Abstract: Technology, in general, is building the shape of future governments and the shape of our lives as individuals, and the rapid progress in technology has led to the emergence of new concepts such as artificial intelligence and machine learning, and it has become indispensable in our daily lives in dealings with the government services and our relationship with the government in the country. Clearly, this technology has become interfering with the citizen's trust in the government and those who are responsible for him in the country. Although few governments can call themselves "artificial intelligence governments" or "E-Government", all governments will need to develop an AI strategy, because AI will invade every field from a simple service for citizens on the mobile apps to healthcare systems and in different ministries.

Keywords: Artificial Intelligence, Machine Learning, Government.

Introduction

The world started to interact with artificial intelligence (AI) on daily basis, from our homes like Alexa and Siri and online services like Facebook and Netflix into chatbots. AI generally reserved the human intelligence using programming or trained computers to do the tasks. Whether it is suggesting the next movie to watch or resolving technical issues. AI will soon penetrate how we engage with our government. From small towns in the United States to countries such as Japan, government institutes are turning to artificial intelligence to assist the people to interact with the government for the services provided to citizens like the virtual assistants. Also, AI could be used for public policy objectives in areas like health, economic, and defensive combat equipment's in the military and more. (Wikipedia, n.d.). According to Harvard Business School "Applications of artificial intelligence to the public sector are broad and growing, with early experiments taking place around the world" (Martinho-Truswell, 2018)

The AI technology is not new concept, form the postal service in 1990s that used machine technology to detect the handwriting letters on the envelopes (Mehr H.). While the advertising in these days to the uses of artificial intelligence in governments are still bounded due to many reasons like limitation of human creativity and

government resources, as well as citizen trust in governments, but the beneficial uses that AI has capable of transferring the governments from the ancient era to the modern era. (Mehr, Hila, H and Fellow, & D, 2017)

AI replaces the government employee area with a computer because AI can understand, predict, interact with humans and machines, and learn to improve itself continuously to more reasonable decisions to become powerful with machine learning ML where the computer learn from the input during the time to enhance responses for example, face recognition, and translation. One situation in which machine learning might be beneficial for the government is when there is a large amount of data and no enough people to manage and analyse it. Other situation ML can automate the routine processes.

This paper explores if should the governments around the world promote or control development in machine Learning and artificial intelligence AI with focus on the current and future uses of AI applications. And describing the important concepts and definitions related to AI and ML and how these technologies feed on the data to work.

Body

Government offices will see the transformations resulting from developmental technology such as artificial intelligence, as will the private sector offices. AI could replace repetitive human functions such as sending tax reminders, transaction payments such as reminders to pay internet bills or taxes and even sending advice based on our health. In addition, Chatbots services for answering public inquiries from citizens, and physical robots will soon be widely used to clean streets, maintain security and maintain public spaces. However, these tasks will only be a small part of what AI will be able to achieve when it comes to rethinking artificial intelligence in governments. (Harris, 2018) Before we get into the discussion about whether governments should use artificial intelligence and machine learning in its systems, we must know what artificial intelligence and ML. In the simplest terms, AI properly is artificial intelligence, and the idea is you have thinking machines or computers that can learn from experience like humans can, and operate without specific instructions, and it can do things like visual perception, and logical reasoning, and learning. AI has closely related filed of machine learning ML which is entire collection of computer algorithms that are able to learn from the data to predict patterns and outcomes. One particularly useful approach in machine learning and AI has been use the neural networks, and these are algorithms that have a very complex set of “hidden layers” of nodes that come in between the input and the output that will offer an intermediate set of processing. Moreover, a very well-developed set of neural networks are called deep learning, it's a specific kind of neural network with many layers that are hidden in between, that allow for a lot of intermediate processing and these have been responsible for some of the most exciting developments in AI. and one of the crucial concepts related to AI is productive modelling and analytics and it is a general practice of building statistical models to predict specific outcomes, like whether a person will have to check into hospital, or whether a person will default on a loan. A productive modelling can be done will AI or ML or it can be done with more standard approaches, but AI has made enormous amount of progress, especially in complex problems of predictive modeling. (Tucci, Laskowski, & Burns, 2019)

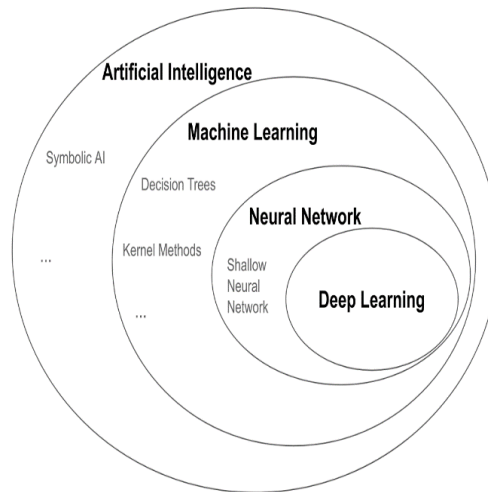


Figure 1. Artificial Intelligence & Machine Learning

TimeLine of AI

The general concept has been around since the 1950s, which is when work began to create machines that could reason, reach conclusions, make decisions, and learn from mistakes. That was the goal, but obviously, the technology was nowhere close to where it is right now, and while it sparked some immediate interest and some interesting developments, it did not go very far. We had a blank period during the 60s where there was not nearly as much progress, and then in the 70s, researchers decided to take a different approach and they made progress by drawing from game theory and mathematics, and the methods of experimental psychology. That was a second major phase in AI. Then in the 1990s more progress was made when IBM's Deep Blue beat the world chess champion Garry Kasparov, something that people thought a machine would never be able to do. Now of course since then, AI's have developed the ability to beat world champions at other games, each step representing an amazing accomplishment in creativity, and really, human problem-solving (Goodrich, 2021).

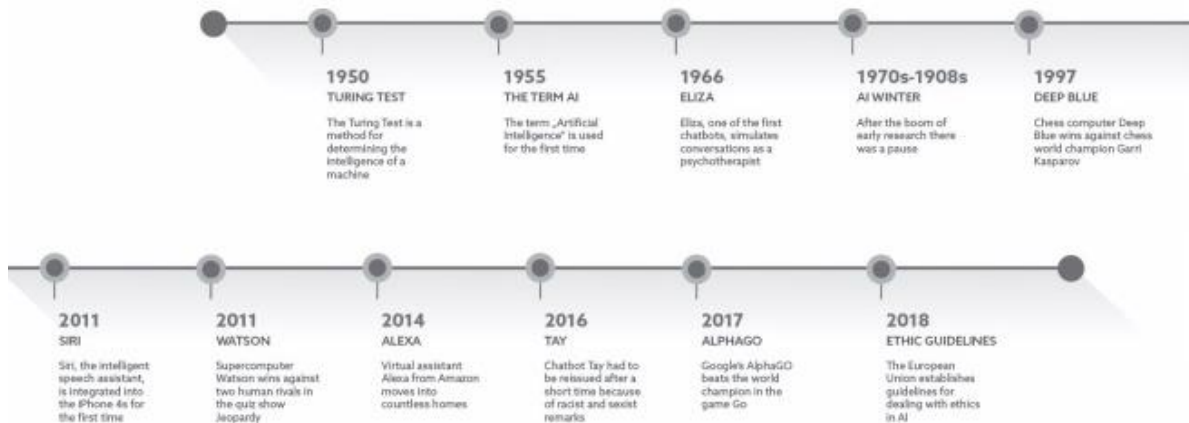


Figure 2. Artificial Intelligence Timeline (1930-2020)

Then most recently in the 2010s, this is the important part, deep learning, this one particular approach to AI, has become economically feasible. The computer technology has caught up to make it doable, the amount of data has caught up to give the algorithms the raw data that they need for processing, and so, this is a very short timeline from the 1950s up till now where we now have an explosion of development and applications of artificial intelligence. (Heuser, 2019)

General and Narrow AI

When we talk about Artificial Intelligence, one important distinction to keep in mind is the difference between General and Narrow AI.

General AI, or Strong AI, is the idea that AI can create general-purpose thinking machines that can reason and learn on many topics, just like a human, and this is the sort of thing we see in science fiction and the popular imagination. The computer that operates just like a person, only better. It is true that was the focus of a lot of prior research, back in the 1950s. However, the amount of information required doing general purpose thinking, and the number of decisions that must be made grow exponentially in what's called a combinatorial explosion. There are so many possibilities, that it very quickly outstrips any computing resources. Therefore, I found that General AI really could not work. It was not feasible. It may be feasible at some point in the future, but because of the explosion of possibilities and resources, researchers had to give up research on that overall goal. (Larkin, 2021)

As opposed to General or Strong AI, there is Narrow, or so-called, Weak AI. Moreover, this is artificial intelligence that focuses on a specific domain, like categorizing photos, or identifying spam email, or approving credit card applications, and it is trying to solve just that one problem. In addition, what this does is it dramatically reduces the size and the complexity of the problem space. It reduces the number of permutations that must be considered when making decisions. Consequently, most of the growth in AI in the past decade has been in these focused domains that has made it much easier. It's still enormously difficult, but it's made it much easier, and really a bounded problem and something that could be solved using the resources that are available and that can explain, in part, the growth in AI over the last decade. AI has passed from being some sort of intellectual curiosity for people stuck a lab, to becoming a business necessity. The AI market is projected to grow between 125% and a 150% each year for several years. That is amazing growth, and most of it has come in the form of Narrow, or again, so-called Weak AI where people are simply trying to solve very specific problems like disease detection. (Larkin, 2021)

Data & Artificial intelligence

Data are unstructured raw facts, as they are details, may be in the form of text, symbols, letters, numbers, voice, or a description of something. The data may not be important in itself, and often has no specific purpose. But the

importance of data come after processing or analyzing it to give us an information to have an insight to make a decision. (Jbara, 2021)

In the last decade a new concept of data has emerged is Big Data, which is a set of data that exceeds the ability to process it using traditional database tools from capturing, sharing, transferring, storing, managing and analyzing within an acceptable period. From the point of view of service providers, it is the tools and processes that organizations need to deal with a large amount of data for the purpose of analysis. (James Manyika, 2011)

Many people think that big data is classified according to size only; in fact, it classified according to the principle of (5V's) and consists of:

1. **Volume:** It is the volume of data extracted from a source, which determines the value and potential of the data to be classified as big data; it may be the most important characteristic of big data analysis. (Karim Dahdouh, 2020)
2. **Variety:** The diversity of extracted data, which helps users, whether as researchers or analysts, to choose the appropriate data for their field of research. It includes structured data in databases and unstructured data that comes from its unstructured nature, such as images, clips, audio recordings, videos, SMS, call logs and map data (GPS)...and much more; It requires time and effort to prepare it in a suitable form for processing and analysis. (Karim Dahdouh, 2020)
3. **Velocity:** It means the speed of data production and extraction to cover the demand for it; Speed is a critical element in making a decision based on this data, which is the time we take from the moment this data arrives to the moment we make the decision based on it.
4. **Value:** It is the ability of big data obtain value from huge masses of heterogeneous data.
5. **Veracity:** it is mean that the data are trustworthy, authorized, origin, available, and have a accountability. (Karim Dahdouh, 2020).

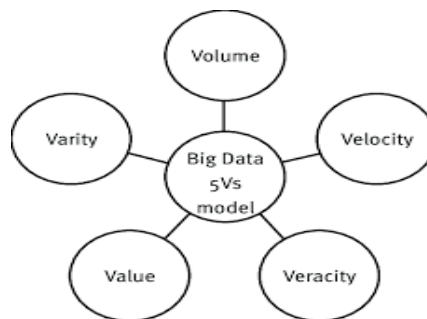


Figure 3. 5 Vs Model

Raw data can be divided into three types

- **Structured data:** the data that organized in tables or databases.

- Unstructured data: It constitutes the largest proportion of the data, which is the data that people generate daily from text writings, images, videos, messages and clicks on websites ... etc.
- Semi-structured data: It considered a type of structured data, but the data is not in the form of tables or databases. (James Manyika, 2011)

The big data processing or big data analysis is the process of examining the available data, for the purpose of extracting and deducing information that may be useful in knowing the reasons for the occurrence of things in the past, or in order to apply them in the present, with the aim of developing life in the future by making certain decisions, where all this is through algorithms where these algorithms rely entirely on the use of artificial intelligence and machine learning software in the analysis and processing to give valuable results. (Forsa, 2021) After identifying, the most important concepts related to artificial intelligence and machine learning, this paper will explain one of the best governments in the world that has implemented these concepts within its institutions and ministries.

The government of the United Arab Emirates represents the best governments in the world in adopting the concept of artificial intelligence in it, where the UAE follows a strategy in which the focus is on building a responsible artificial intelligence country and keenness on a positive and sustainable impact in the long run and for future generations. This is because the UAE government and its leadership realized the existence of a new wave of change that will shape the features of the economy, societies and governments themselves, and they wanted to understand how we can achieve the transition because the data scientist in UAE strongly believe that the future of the world is data and artificial intelligence. This led many UAE princes and rulers to discuss the new sectors that will be focused on in order to create the new economy of the Emirates and what sectors the UAE wants to achieve leadership in the next 50 years. Where UAE created a specialized government only for artificial intelligence called the "Artificial intelligence Ministry" to promote AI inside the Emirates and the UAE Minister of State has held it for Artificial Intelligence, Omar bin Sultan Al Olama, since October 2017. (Intelligence, 2020)

AI Government in UAE does not look at artificial intelligence as a technology only, but as a good tool to improve human lives, provide job opportunities and employ them for the good of people and not for what is bad for them, and the strategy followed by this government divided into two parts:

The first part of the strategy is for the government to adopt AI technology in five priority sectors: resources and energy, logistics, tourism and hospitality, healthcare, and cybersecurity, as well as the government's business itself. The second part of the strategy is related to developing the UAE's regional capabilities so that it becomes a net source of artificial intelligence in the future. (Alaral, 2021)

PricewaterhouseCoopers PwC estimates that the UAE will enjoy the greatest growth, as artificial intelligence will represent approximately 14 percent of the country's GDP by 2030, while this percentage is limited to 2 percent in the rest of the region. (Alaral, 2021)

The UAE was chosen as the best regional country in the Government Readiness Index for Artificial Intelligence 2020, and the readiness for optimal investment in the benefits of artificial intelligence technologies, recently issued by the global consulting company “Oxford Insights” in the United Kingdom, and the Canadian International Development Research Center IDRC, to confirm the success of the plan. The state in the advancement of artificial intelligence. (Nasser, 2020)

Several factors have contributed to the enhancement of artificial intelligence and its global lead, the most prominent of which is the adoption of a clear strategy with specific goals to advance the sector, the establishment of a Ministry of Artificial Intelligence, the presence of the Mohammed bin Zayed University of Artificial Intelligence, the provision of capabilities, legislation and laws necessary for its success, the promotion of innovation and entrepreneurship, in addition to the quality of orientation and vision. Too early for leadership to achieve artificial intelligence. (Nasser, 2020)

What the UAE is doing in organizing and promoting artificial intelligence is very important, and governments in all countries of the world must follow the same approach that the UAE is taking because it is the indispensable technology of the future and without it governments will be undeveloped and backward.

Is Government ready to AI?

“This is a practical way of using AI to mitigate a problem, minimize the impact on the economy and reduce pollution overall,” said Jeff Welser, vice president and director of the Almaden Laboratory. State and local governments face their own hurdles to deploying AI, beyond fundamental challenges with AI itself. Not surprisingly, historically low levels of IT investment in the public sector have slowed the introduction of AI into government. “If you look at the technology stack in state and local government, it’s pretty old,” said McKinsey’s Cheatham. “Basic technology infrastructure has not been updated at the rate found in the private sector.”

Cheatham also points to the lack of data scientists in the public sector as another reason why AI is spreading so slowly. Without the knowledge or expertise to craft AI solutions, state and local governments will rely heavily on others to figure out how to best use AI. Then there is the public’s recklessness about artificial intelligence. What does it mean to have algorithms that support public policy and decision-making? Asked. As a result, the government will need to be much more transparent than the private sector when it comes to adopting and using AI. (Harrison, 2020)

Benefits of using AI in government

The potential uses of AI in government are wide and varied, and one of the uses of AI in governments is in Military. Artificial intelligence anywhere faces a number of different challenges but artificial intelligence in the military faces some especially significant ones. They might be technical, ethical, or even social.

The technical challenges of military AI are significant. AI and machine learning work by analyzing patterns in existing data and matching new data to those patterns. That works in many situations. Which is mean, if we are classifying spam email or pictures of cats, it works great, but warfare is built on surprise. An enemy is going to try not to use the same approach they've used before, and so you constantly will have novelty and what this means is that AI can say whether a particular observation is unusual, it can say I don't really know what's going on here, but it may not be able to provide more information and match it up to some strategy that you know how to respond to, and military scenarios may not allow enough time for adequate human-in-the-loop decision-making and these are technical challenges and there are ways they can be overcome with better programming, with better training data, and with better implementation, but because of the military context, they require special significance.

There are also important ethical challenges to military AI. Obviously, the most spectacular of these concern lethal autonomous weapons or LAWS. That is the idea of a machine that can actually fire on people all on its own. Autonomous defense systems have existed for decades. Warships have systems that can detect incoming missiles or aircraft and fire automatically. Many tanks have similar autonomous systems and even some countries have autonomous sentry guns that can fire at potential attackers without human intervention. So it is not that AI is introducing the concept of autonomous weapons, it is introducing a new level of complexity into them. There is also the debate about what it means to be autonomous and degrees of autonomy ranging from weapons that can be completely self-directed, those that you simply say go get the target, they go do it on their own, to those that are capable of being self-directed, to weapons that have any processing involved in targeting or preparation for attack. The point of this is there is going to be debate about what kind of weapons count as autonomous and what regulations apply to which ones, it is important to remember that autonomous defense systems have existed since the 1970s. Warships, for example, can have systems that detect incoming missiles or aircraft and can fire automatically. Many tanks have similar autonomous defense systems, and certain countries even have autonomous sentry guns that can fire at potential perceived attackers without any human intervention. Therefore, it is not that AI is introducing something new in terms of being autonomous, but it is introducing a new level of complexity. Also, AI can respond to critical situations much faster than humans and consequently, there may actually be an ethical necessity that the AI is needed in order to provide the protection, that's the whole purpose of the military in the first place, and so this doesn't answer the ethical challenges but it lets you know what some of the most critical ones are. This is going to be an ongoing debate for some time, but I want to finish by mentioning the social challenges of military AI. These are different from the technical or the ethical elements. The military frequently collaborates with university researchers on projects and with commercial tech organizations, and those bring up their own issues, so for instance, Facebook, Google, Microsoft, Amazon, and Oracle have all faced criticism for their involvement on military projects, and sometimes this leads to changes, so for example, in a response to social pressure, Google actually declined to bid on the Joint Enterprise Defense Infrastructure, that's JEDI or a common cloud computing system for the military. Google has other projects to do with the military, but this one, again, because of social pressure, they bowed out. On the other hand, there is another social challenge and that is the difficulty in confronting social media disinformation campaigns due to many users' disbelief, they do not think that it is fake; they don't think that it exists, they don't think that it can be

influenced. Therefore, those are social challenges in response to offensive military AI. It lets you know there are many facets to this and it lets you know there are no easy answers to this. My point in bringing up these discussions of military AI has not been to say this is the correct response or this takes care of this one completely, but to give the parameters of the discussion and to let you know that companies and the public and the military and the government all have roles in planning to make sure that AI in the military is done in an ethical manner both to not cross lines that cause problems but also to make sure that they adequately defend the populace, which again is the entire purpose of having the military in the first place and that's something that AI has the potential of making much much more effective. (Frank Strickland, 2019)

Conclusion

The Sum up of this paper tries to explain if he should the governments around the world promote or control development in Machine Learning and artificial intelligence AI with a focus on the current and future uses of AI applications especially in the military sector and how AI change the way of war. . And describing the important concepts and definitions related to AI, ML, neurology and deep learning and how these technologies feed on the data to make some process and analytics to get insights and make decisions from it can change our life to the best

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Classroom Teachers' Metaphorical Perceptions Regarding the Concepts of Independence and Struggle

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Abstract: Metaphor is a tool that helps us perceive the world by expressing more than word art. Metaphors are used in certain areas of education. It appears in different ways in the fields of literature, philosophy, sociology, educational sciences, social studies. Teachers also tell concrete and abstract data through metaphors to make it easier to keep in mind and to make it more understandable. The purpose of this study is to perceive the metaphor perceptions of the concepts of "independence" and "struggle" that reveal the mental perceptions of classroom teachers. The method of this research is designed with one of the qualitative research methods, phenomenology. The research was conducted in the fall semester of the 2020-2021 academic year. The working group of the study 33 classroom teachers serving in various provinces and districts of Turkey (28 women, 5 man) was performed. "Independence is like; because" and "Struggle is like; because" questions were asked. The data were interpreted through content analysis. The metaphors obtained according to the content analysis were categorized according to their common features in terms of meaning, and tables were created and interpreted. The metaphors about the concept of "independence" are divided into 7 conceptual categories, and the metaphors about the concept of "struggle" are divided into 5 conceptual categories. According to the results obtained in this study, a metaphor has been explained mostly in the category of freedom with 57.4% about the concept of "independence". In this category, the metaphor of "bird" was formed at the most with 15.2%. With 45.2% regarding the concept of "struggle", it is mostly explained in the category of overcoming difficulties. In this category, the metaphor of "life" was formed at most with 12.1%. The metaphors created by the classroom teachers participating in the study reveal that they perceive them in a way that is equivalent to the definitions used in the Social Studies course. In the light of the findings, the research group can be changed, more different research can be done using qualitative and quantitative methods, and comparative studies with demographic information can be made.

Keywords: Independence, Metaphor, Struggle.

Introduction

The word metaphor means "to change" and pherein means "to carry" in Greek (Levine, 2005; Koçođlu 2014; Korkut and Keskin 2016). Çelikten (2006) expresses the use of metaphors as a way of thinking and seeing that helps us understand the world, while Patton (2018) says that metaphor is a tool to explain certain features of an event or object.

Metaphors play an important aesthetic, decorative and pedagogical role not only in literature but also in education (Akman et al., 2022; Botha, 2009; Bulut, 2021a, 2021b; Bulut & Kirbas, 2022; Kaban, 2021a, 2021b; Onal, 2019; Palic Sadoglu & Durukan, 2018). It is accepted as an important part of the art of rhetoric, one of the types of metaphor, which is one of the decorative expression tools. It takes place as one of the rhetorical arts of embellishing discourses in a rhetorical way in Turkish lessons (Yörük, 2017). Contrary to expressing rhetoric, metaphors are an integral part of the contemporary education system (Çekten, 2006; Gülođlu and Karairmak 2012). Metaphors are used in various fields of education. These take place in different forms in the fields of social sciences, educational sciences, philosophy, sociology and literature (Zeren & Yapıcı, 2014). Metaphors are used in education to give meaning to concepts and to explain concepts more clearly (Gültekin, 2013). While teachers are explaining the concepts, they will enable students to understand them better in their minds and make it easier to keep them in mind in the long run (Arslan & Bayrakçı, 2006; Aydogan & Koc, 2022; Banihashem et al., 2021; Demirbilek, 2022; Demirbilek et al., 2021; Garza, 2021; Hwang et al., 2021; Smith, Shelley, & Higgins, 2021). Metaphor has creative potential. The emphasis of a concept chosen as a metaphor is its superior aspects. In this respect, for example, we use the term "like a crow" to people with a bad voice. The color of the crow and its feet are in the background, and we do not care about them. What really interests us is his prominent and emphasized voice (Morgan, 1980).

Although the subjects of independence and struggle are mentioned within the scope of Social Studies course, these concepts are not explained in a single unit or subject within the framework of the curriculum within the scope of values education. These values are included throughout the entire academic year (MEB, 2018).

There are many definitions of independence according to the branches of science. These can be said in the field of politics, philosophy and education. Independence in the political sense is our state of not being dependent on foreign sources in terms of economy. In a philosophical sense, independence is an evaluation in the historical process in the sense of thought. In terms of education, it is the student's ability to be self-sufficient and manage his mind by taking his own responsibility (Güneş, 2013).

According to TDK (2011), struggle has two meanings:

1. "Hard effort, war between two sides to get each other to accept their wishes."
2. "The strong, sustained effort of a person or group of people to counteract a force, to achieve any purpose, struggle"

Independence is the foremost Atatürk's principle. For this reason, the slogan of the National Struggle is "Either independence or death!" (Nutuk, 2007, p.10). According to Atatürk, the importance of independence dates back to before the National Struggle period. He always expresses the importance of independence everywhere. In his speech at the congresses, he convened and the newspaper Hakimiyet-i Milliye, he explains in his Speech book that independence should not only be a piece of land but also in the fields of politics, social and economy (Özdemir, 2017). Atatürk has many aphorisms in which he explains the importance of independence in this sense. One of them is Atatürk's statement, which is one of his metaphorical approaches on independence: "The National Sovereignty is such a light that chains melt in front of it, crowns and thrones burn and perish" (Söylev ve Demeçler II, 1997, p.185). When we look at this statement of Atatürk for the importance of independence, he likened sovereignty to light and attributed even more meaning to independence than light and tried to express that the light of light burns with a fire that will destroy all negative situations.

The concepts of independence and struggle in the 4th grade Social Studies lesson In the Culture and Heritage Unit, "Understands the importance of the National Struggle based on the lives of the heroes of the National Struggle." and in the Effective Citizenship Unit "Describes the relationship between the independence of his country and his individual freedom, and his own role in this matter." talks about. In this context, one of the goals and principles of the teachers who teach Social Studies is to create an awareness of the students to develop a democratic and developed society in every field (MEB, 2018).

When we look at the literature, although it is seen that metaphor work has been done a lot, it has been seen that metaphor work for the concept of independence has been done in a small number. Studies on independence (Kuziyev, 2018; Güneş, 2013; Tayhani, 2020; Kazaz and Acar, 2020; Söylemez, 2020; Özdemirci and Torunlar, 2017; Şentürk, 2019; Binici, 2018; Bengi, 2019; Köylü, 2019; Andican, 2017; Yeşil, 2017; Dagestan and Sofuoğlu, 2005). He worked with the metaphor of independence (Aydemir and Ulu Kalın, 2018) and (Ulu Kalın and Koçoğlu, 2017). We come across many articles written about the struggle; (Eryılmaz, 2015; Avşar and Öğütoğulları, 2012; Baharçipek, 2000; Sariçoban, 2017; Baykal, 1984; Gündüz 2006; Kızıler, 2017; İncedal and Coşkun, 2013; Akgül and Kaptı, 2010; Tuğba and Hidayet, 2016; Gürses, 2007; Ersari and Naktiyok, 2012; Bengi 2011). However, when the literature is examined, it is seen that there is no metaphor study related to the concept of struggle. In this respect, the study is important in terms of its originality.

In the light of the above literature, the aim of this study is to reveal the mental perceptions of primary school teachers about the concepts of independence and struggle through metaphors. For this purpose, answers to the following sub-problems will be sought:

1. With which metaphors did primary school teachers explain their mental perceptions about the concept of independence?
2. What are the common conceptual categories created by the metaphor developed for the concept of "independence"?
3. With which metaphors did the primary school teachers explain their mental perceptions about the concept of struggle?

4. What are the common conceptual categories created by the metaphor developed for the concept of "struggle"?

Method

Pattern of the Research

The phenomenological design, which is one of the qualitative research models, was used to determine the mental perceptions of primary school teachers about the concepts of independence and struggle through metaphors technique. Phenomenology is exploring how they make sense of human experience and transforming them into experience consciousness as individual and shared meaning (Patton, 2018). Phenomenology; It is a type of research that reveals interesting and different perspectives on learning, teaching and educational processes. In addition, he argues that educational practitioners (and students) can bring a new perspective to meaning making and complex processes through meaning (Mescht, 2004).

Working Group

In this study, snowball (chain) sampling method, one of the purposive sampling methods, was used while determining the study group. In this method, the question determined by interviewing many people is asked. After the question was asked, "Can you suggest anyone else I can interview with?" The question is asked and the number of people who will participate in the research increases. Then, the people who are most suitable for the purpose of the research are determined and included in the research (Patton 2018; Özmen and Karamustafa 2019). The reason for using this method is that the course of the covid-19 epidemic is high, it is in the distance education period and there is no opportunity to reach face-to-face.

This research was asked to 33 classroom teachers (28 F, 5 M) working in public and private schools affiliated to the Ministry of National Education in various provinces and districts in Turkey in the fall semester of the 2020-2021 academic year. The age of the participants in the research is between 26-55, the average age is 33.54. Most of the teachers work in the central provinces and districts.

Data Collection

The data obtained in the research were created using a semi-structured open-ended question form. As the first stage of the research, when the participants were contacted, information about the metaphor was given, and then questions consisting of 2 parts were asked. The questions were made by contacting the social communication network (whatsapp and instagram) due to the covid-19 epidemic. In the first part, gender, age and place of education (province/district/village). In the second part, "Independence is like Because,; Struggle is like Because," questions were asked and they were asked to create a single metaphor.

Analysis of Data

According to the results of the research, content analysis technique was used. In content analysis, metaphors are categorized and organized in a meaningful way. The created concepts are written in appropriate categories in a logical integrity and the data is explained (Yıldırım & Şimşek, 2018). The metaphors created by the classroom teachers participating in the research were examined in 5 different categories. These categories were created by taking into account the data analyzes in Gültekin (2013) study. 1. Naming and elimination, 2. C, 3. Creating categories, 4. Ensuring validity and reliability, 5. Analyzing quantitative data in computer environment

1. Naming: A list was created to examine the metaphors developed by classroom teachers.

2. Screening and Coding: In the created list, it was checked whether the metaphors created by the teachers were meaningful. All 33 metaphors were considered valid, illogical metaphors did not occur. Each class teacher was coded as SÖ1 (class teacher 1), PS2 (class teacher2),

3. Category creation and metaphor compilation: The categories made by content analysis were examined by being under the same category in terms of their common features according to the metaphor explanations. The concept of "independence" is divided into 7 different categories, and the concept of "struggle" is divided into 5 different categories.

4. Ensuring validity and reliability: Expert opinion was sought to ensure the reliability of the study. The expert was given an alphabetical list of metaphors and a list of categories. They were asked to match so that no metaphor expressions were left out. The consensus between the expert and the researcher was examined.

The reliability of the study was based on Miles and Huberman's model. This model (Confidence Formula = Consensus/Consensus + Disagreement) is made by looking at the internal consistency between the expert and the researcher. Consistency between the expert and the researcher is expected to be at least 80% (Miles & Huberman, 1994 cited in Baltacı, 2016). It was found that the research was reliable at a rate of 84% on the concept of "Independence" (Reliability= $33/33+7= 0.84$) and at a rate of 84% on the metaphor of "Struggle" (Reliability= $33/33+7=0.84$). According to Yıldırım and Şimşek (2018), after the data is collected, reporting it in detail and reaching the research results significantly supports the validity of qualitative research. The evaluation of the data by another expert supports the validity as well as the reliability in this respect. The importance given to validity also ensures reliability.

5. Transfer to computer environment: The number of people represented by the created metaphor is shown with f (frequency) and % (percentage) values. These values and tables were prepared in the excel program.

Results

Table 1. Classroom Teachers' Metaphors for the Concept of "Independence" and the Number and Percentage of Teachers Representing Them

Metaphor Name	<i>f</i>	%
1. bird	5	15.2
2. being yourself	2	6.1
3. water	2	6.1
4. breaking the chains	2	6.1
5. Ataturk	1	3.0
6. dependence	1	3.0
7. fish in the sea	1	3.0
8. flag	1	3.0
9. to work	1	3.0
10. sea	1	3.0
11. diamond	1	3.0
12. factory	1	3.0
13. no invisible strings	1	3.0
14. peace	1	3.0
15. liberty	1	3.0
16. living without adhering to strict rules	1	3.0
17. ability to express your own opinion freely	1	3.0
18. village	1	3.0
19. struggle	1	3.0
20. breath	1	3.0
21. freedom	1	3.0
22. money	1	3.0
23. parachuting	1	3.0
24. drawing a picture	1	3.0
25. flying	1	3.0
26. intelligence	1	3.0
Total	33	100.0

3.0% of 26 metaphors (Atatürk, addiction, fish, flag, work, sea, diamond, factory, peace, freedom, absence of invisible threads, living without following strict rules, being able to express your own opinion freely, village,

struggle, breath, money) , parachuting, painting, flying, wit) are represented by a teacher. 4 metaphors (being yourself, bird, water, breaking the chain) were represented by 6.1%-15.2%. As can be seen in the table, classroom teachers compared the metaphor of independence to the concept of a bird the most. The concept of bird constitutes 15.2% of the participants in the research.

Table 2. Categories Created by Metaphors of Classroom Teachers for the Concept of Independence

Categories	Metaphor <i>f</i> (frequency) % (percent)	Total frequency	Total percentage	Number of metaphors
1. Independence as a Concept of Freedom	Flag (<i>f</i> : 1, 3.0%), Sea (<i>f</i> : 1, 3.0%), Fish in the Sea (<i>f</i> : 1, 3.0%), liberty (<i>f</i> :1, 3.0%), living without adhering to strict rules (<i>f</i> :1, 3.0%), ability to express your own opinion freely (<i>f</i> : 1, 3.0%), Being yourself (<i>f</i> :2, 6.1%), Bird (<i>f</i> :5, 15%),2), Freedom (<i>f</i> : 1, 3.0%), Parachuting (<i>f</i> :1, 3.0%), Drawing a picture (<i>f</i> :1, 3.0%), Flying (<i>f</i> :1, 3%) ,0), Breaking the Chains (<i>f</i> :2, 6.1%)	19	57.3	13
2. Independence as a Basic Need	Breath (<i>f</i> : 1, 3.0%), Money (<i>f</i> :1, 3.0%), Water (<i>f</i> :2, 6.1%)	4	12.1	3
3. Independence as a Valuable Asset	Atatürk (<i>f</i> : 1, 3.0%), Diamond (<i>f</i> : 1, 3.0%)	2	6.0	2
4. Independence in Direction	to work (<i>f</i> : 1, 3.0%), Village (<i>f</i> : 1, 3.0%)	2	6.0	2
5. Independence as Production	Factory (<i>f</i> : 1, 3.0%)	1	3.0	1
6. Independence as Abstract Thought	Dependence (<i>f</i> :1, 3.0%) , no invisible strings (<i>f</i> : 1, 3.0%), Peace (<i>f</i> : 1, 3.0%), Intelligence (<i>f</i> :1, 3.0%)	4	12.0	4
7. Independence as a Hard-to-Reach Concept	Struggle (<i>f</i> : 1, 3.0%)	1	3.0	1

Category 1: Independence as a concept of freedom

When Table 2 is examined, 13 metaphors have emerged in the category of "independence as a state of freedom". When we look at the table, 19 people out of 33 teachers represent this category. Among the categories, the highest number of categories is in this category with 57.3%. In this category, the metaphor of "bird" was formed with a maximum of 15.2%. This metaphor is represented by f: 5 people. According to the explanations, the reason why the participants said the "bird" metaphor stems from the relationship they have established between the freedom of birds to fly wherever they want and independence. A few metaphor expressions of teachers to summarize the metaphors in the category are given below.

S.Ö.6: "Independence is like flying. Because your wings will take you wherever you want."

S.Ö.7: "Independence is like a bird. Because you can fly freely."

P.O.32: "Independence is like drawing a picture. Because when we draw, we can act with our own creativity, free emotions, and unrepressed emotions, no matter how old we are."

S.Ö.1: "Independence is like the sea. Because he can move as much as he wants in his own field."

Category 2: Independence as a Basic Need

When we examine Table 2, 3 metaphors have emerged in the category of "independence as a basic need". The metaphors created are represented by f:4 people and the total percentage value is expressed as 12.1%. Water metaphor was formed with a maximum of 6.1%. The excessive occurrence of the "water" metaphor is due to the fact that the teachers who created the metaphor see it as an indispensable need according to the answers they give.

Sample expressions to summarize the metaphors in the category are given below.

S.Ö.4: "Independence is like breathing. Because it is impossible to live without it."

P.Ö.15: "Independence is like water. Because, just as water is a basic need for people, independence is a must for a person or a nation."

Category 3: Independence as a Valuable Asset

When Table 2 is examined, it is seen that the number of people representing this metaphor is (f:2, 6.0%). Atatürk and the diamond were considered as valuable assets and were included in this category. The expression of the teacher in this category is given below.

P.S.28: "Independence is like a diamond. Because it is very, very valuable."

S.Ö.17: "Independence is like Atatürk. Because we achieved our independence thanks to Atatürk."

Category 4: Independence in Direction

In the category of "independence in the sense of giving direction" in Table 2, 2 metaphors were formed. 2 people (f:2, 6.0%) represent this metaphor. They stated that the metaphors these teachers created gave direction to life according to their meanings. Metaphors in this category are given below.

S.Ö.2: "Independence is like a village. Because when we go there, it becomes possible for us to give more direction to our lives."

P.S.29: "Independence is like working. Because we cannot reach our goals without working."

Category 5: Independence as Production

When we examine Table 2, the teacher likened the concept of independence to a factory producing. When we look at the table, there is 1 metaphor in this category and it is seen that only f:1 represents the teacher. The metaphor created by the teacher is given below.

P.O.22: "Independence is like a factory. Because the more you produce, the more independent you become."

Category 6: Independence as Abstract Thought

When we examine Table 2, 4 metaphors were created in this category. The metaphors created are represented by f:4 people and the total percentage value is 12.0%. The reason why teachers liken the concept of "independence" to abstract concepts in this category is because they connect with some experiences that affect them in daily life. Sample metaphors created by teachers are given below.

P.S.16: "Independence is like the absence of invisible threads. Because even if people do not realize it, they attach themselves to each other with invisible threads and are restrained."

P.O.27: "Independence is like intelligence. Because if you are ignorant, you always need someone."

S.Ö.19: "Independence is like peace. Because people under pressure are unhappy and restless."

Category 7: Independence as a Hard-to-Reach Concept

When we examined Table 2, 1 metaphor was created in this category. f: 1 person represented the created metaphor with 3.0%. The teacher saw the concept of independence as a struggle. He tried to express that he could achieve his independence with a hard effort just like struggle. The metaphor created by the teacher is given below.

S.Ö.3: "Independence is like struggle. Because you can never have without a struggle."

3. Using which metaphor did the primary school teachers explain their perceptions of the concept of "struggle"? When Table 3 is examined, primary school teachers have created 26 metaphors related to the "struggle" metaphor. How many people represented the created metaphors and their percentage values were given.

13 of 26 metaphors (Swimming against the current, Fighting for your purpose, The ordeal of a minimum wage worker, Arcade game, Success, Baby, Fighting the ignorant, Resisting the Wave, Energy, Power, Sun, Not giving up despite all, Work, Whip, Character, Ant, Book, Face of a random worker, Drop of water, Game of chance, Seed, Deer in the wild) is represented by a teacher. 10 metaphors show the metaphors represented between 3 and 4 (Life, War, Life). As can be seen in the table, classroom teachers compared the metaphor of struggle to the concept of life the most. The concept of life constitutes 12.1% of the respondents.

Table 3. Classroom Teachers' Metaphors for the Concept of "Struggle" and the Number and Percentage of Teachers Representing Them

Metaphor Name	f	%
1. to live	4	12.1
2. life	3	9.1
3. war	3	9.1
4. swimming against the current	1	3.0
5. fight for your purpose	1	3.0
6. the suffering of a minimum wage worker	1	3.0
7. arcade game	1	3.0
8. success	1	3.0
9. baby	1	3.0
10. fighting the ignorant	1	3.0
11. wave	1	3.0
12. resisting	1	3.0
13. energy	1	3.0
14. power	1	3.0
15. sun	1	3.0
16. not giving up despite everyone	1	3.0
17. business	1	3.0
18. whip	1	3.0
19. character	1	3.0
20. ant	1	3.0
21. book	1	3.0
22. the face of a worker we see randomly	1	3.0
23. water drop	1	3.0
24. game of chance	1	3.0
25. seed	1	3.0
26. deer in the wild	1	3.0
Total	33	100.0

3.0% of 26 metaphors (energy, sun, ant, seed, deer in the wilderness, not giving up despite all, character, book, swimming against the stream, ordeal of a minimum wage worker, fighting ignorance, resistance, power, work, whip, the face of the worker we see randomly, fighting for your purpose, success, baby, wave, water drop, arcade game, game of chance) is represented by a teacher. 3 people represent the metaphor of "life" and "war" with 9.1%. The most created metaphor is "life", represented by f:4 people with 12.1%. The reason why the

participants created the metaphor of "life" is that, according to their explanations, they think that life itself and the situations that exist in it are maintained in a struggle with it.

Table 4. Categories Created by Classroom Teachers' Metaphors Regarding the Concept of Struggle

categories	Metaphor <i>f</i> (frequency) % (percent)	Total frequency	Total percent	metaphor qty
1. Struggle as an effort to exist in nature	Energy (<i>f</i> :1, 3.0%), Sun (<i>f</i> : 1, 3.0%), Ant (<i>f</i> : 1, 3.0%), Seed (<i>f</i> : 1, 3.0%), deer in the wild (<i>f</i> : 1, 3.0%)	5	15.0	5
2. struggle against oneself	Not Giving Up Despite Everyone (<i>f</i> : 1, 3.0%), Character (<i>f</i> : 1, 3.0%), Book (<i>f</i> : 1, 3.0%)	3	9.0	3
3. Struggle as Overcoming Challenges	Swimming against the current (<i>f</i> : 1, 3.0%), The suffering of a minimum wage worker (<i>f</i> : 1, 3.0%), Fighting the ignorance (<i>f</i> : 1, 3.0%), Resisting (<i>f</i> : 1, 3.0%), Power (<i>f</i> : 1, 3.0%), Life (<i>f</i> : 3, 9.1%), Work (<i>f</i> : 1, 3.0%), Whip (<i>f</i> : 1, 3.0%), the face of a worker we see randomly (<i>f</i> : 1, 3.0%), to live (<i>f</i> : 4, 12.1%)	15	45.2	10
4. Struggle as Perseverance	fight for your purpose (<i>f</i> : 1, 3.0%), Success (<i>f</i> : 1, 3.0%), Baby (<i>f</i> : 1, 3.0%), Wave (<i>f</i> : 1, 3.0%), Water drop (<i>f</i> : 1, 3.0%)	5	15.0	5
5. Fight by Result	Arcade game (<i>f</i> : 1, 3.0%), War (<i>f</i> : 3, 9.1%), Game of chance (<i>f</i> : 1, 3.0%)	5	15.1	3

Category 1: Struggle as an Effort to Exist in Nature

When we examine Table 4, 5 metaphors were created in this category. The created metaphors are represented by *f*:5 people. The total percentage value is expressed as 15.0%. Teachers perceived the struggle as a struggle in nature. Sample metaphors attributed by teachers to the concept of "struggle" are given below.

S.Ö.1: "Struggle is like an ant. Because ants fight for everything. It carries a load, it fights against the bumps, it tries to rebuild when its nest is broken."

P.S.30: "Struggle is like a deer in the wild. Because it struggles to survive by escaping from other animals that want to hunt."

S.Ö.14: "Struggle is like a seed. Because, against all kinds of difficulties, he rises above the ground and sees the sun. If he clings to the ground, he wins the fight and enjoys the sun."

Category 2: Struggle against oneself

When Table 4 was examined, 3 metaphors were formed in this category. The metaphors that make up this category are represented by f:3 people, and the total percentage values are expressed as 12.0%. The reason why teachers create the concept of struggle against themselves is that they want to talk about their struggle with themselves according to the explanations they make. Sample teacher metaphors are given below.

P.O.20: "Struggle is like a book. Because the more you read, the stronger you get."

S.Ö.8: "Struggle is like character. Because, regardless of the degree of difficulties encountered, if you do not have a strong character, the patience and effort required for the struggle means that you are far from sanctity."

Category 3: Struggle as Overcoming Challenges

When we examine Table 4, f: 15 people among 33 teachers, metaphors related to the concept of "struggle" were placed in the category of freedom. 10 metaphors were created in this category. The metaphors with the highest number of categories are in the category of "struggle as a situation of overcoming difficulties" with 45.2%. According to the explanations, the reason why the teachers participating in the research created more metaphors in this category; It has been tried to express that many difficulties are experienced and that they see difficult situations as struggle. Metaphors to summarize teacher statements in this category are given below.

S.Ö.2: "The struggle is like the suffering of a minimum wage worker. Because to educate your children with that money means to fight the country's economy."

S.Ö.6: "Fighting is like swimming against the current. Because you have to work hard to get where you want to be."

P.S.29: "Struggle is like work. Because we have to work at work to earn money, and we strive for it."

P.O.21: "Struggle is like life. Because we are always in a race. To have something, to achieve something, we are in a struggle with others, with ourselves, with life itself."

P.S.16: "Struggle is like resistance. Because, while struggling with negativities, it is necessary to resist in order to win."

Category 4: Struggle as Perseverance

When Table 4 was examined, 5 metaphors were created in this category. Each metaphor is represented by f:1 person. This category constitutes 15% of the teachers. The reason why teachers perceive "struggle" as a concept that can achieve what they want with determination is that they try to explain that it is possible to reach their goals if they struggle patiently without giving up. Sample teacher metaphors are given below.

P.O.23: "Struggle is like a wave. Because, as the waves hit the shore, they shape the shore after a while."

P.S.28: "Struggle is like a drop of water. With patience, the drips become a lake, and with patience they pierce the marble, which is said to be dripping."

S.Ö.31: "Struggle is like a baby. Because he insists on getting what he wants."

Category 5: Fight by Result

When we examined Table 4, 3 metaphors were created in this category. The number of teachers representing these metaphors is f:5. This category created represents 15.1% of the teachers participating in the research. They tried to express that the reason why the metaphors created by the teachers according to their answers were formed in this category could be the situation of winning or losing depending on the outcome of the struggle. Sample teacher metaphors are given below.

P.S.9: "Struggle is like a game of chance. Because it is not known whether the result will be positive or negative."

S.Ö.33: "Struggle is like an arcade game. Because you can either win or lose."

S.Ö.5: "Fighting is like fighting. Because in order to live in this world, you have to fight either with people or with thoughts."

Discussion, Conclusion and Recommendations

A total of 33 classroom teachers working in different provinces and districts in Turkey (Isparta, Antalya, Istanbul, Zonguldak, Van, Ankara, Osmaniye, Izmir) participated in the research, and a metaphor study was conducted to reveal their mental perceptions about the concepts of "independence" and "struggle".

In this study, 7 conceptual categories related to the concept of "independence" (independence as a concept of freedom, Independence as a Basic Need, Independence as a Valuable Asset, Independence as a Direction, Independence as Production, Independence as Abstract Thought, Independence as a Hard-to-Access Concept) were created. . Classroom teachers participating in the research;

- 57.4% of them created metaphors in the category of "independence as a concept of freedom". The metaphors that fall into this category are "flying", "flag", "drawing", "bird", "being yourself", "flying with a parachute", "breaking chains", "sea", "freedom", "fish", "freedom", "being able to express your own opinion freely", "living without following strict rules".
- 12% of them created a metaphor in the category of "independence as a basic need". These are the metaphors of "money", "breath", "water".
- 6% used the metaphor of "Atatürk" and "diamond" in the category of "independence as a valuable asset".
- 6% used the metaphors of "village" and "work" in the category of "independence as direction".
- 3% used the metaphor of "factory" in the category of "independence as production".

- In the category of "independence as an abstract idea", 12% used metaphors of "absence of invisible threads", "addiction", "peace", "intelligence".
- 3% of them used the metaphor of "struggle" in the category of "independence as a hard-to-reach concept".

Among the metaphors, the most created is the "bird" metaphor with 15.2%. Accordingly, the majority of the classroom teachers participating in the research responded to the concept of independence according to its meaning in the literature. This shows that teachers perceive the concept of independence as equivalent to the definition used in the Social Studies course.

In the metaphor study on the concept of independence in the literature, a research was conducted with 122 Social Studies teacher candidates by Ulu Kalın and Koçoğlu (2017), 35 valid metaphors were produced and divided into 7 different categories. As a result of the research, most of the participants in the research created a metaphor in the category of independence as the state of being free. With the results of the research conducted by Ulu Kalın and Koçoğlu (2017), in the metaphor study of the concept of independence with classroom teachers in this study, the metaphor of "bird" was formed the most, and it was seen that there was a similarity in terms of creating a metaphor in the category of freedom. In this respect, the results of the research and the definitions used in the Social Studies course are very similar to each other. In the light of the findings of the study conducted with 8th grade students by Aydemir and Ulu Kalın (2018), the perceptual changes before and after the application were examined in order to measure their perceptions of the value of "independence". It has been seen that the meaning is in accordance with the scientific definition (flag, state, nation). It is understood that there is a similarity between the study of Aydemir and Ulu Kalın (2018) and this study. According to the findings of this research, metaphors were formed mostly in the category of "independence as a concept of freedom" and the similarity between the metaphors and the scientific definition proves this.

Metaphors for the concept of "struggle" are discussed in 5 conceptual categories (Struggle as an Effort to Exist in Nature, Struggle Against Oneself, Struggle as Overcoming Difficulties, Struggle as Perseverance, Struggle by Result). Metaphors created in the category of struggle as overcoming difficulties with a maximum of 45.2% among the conceptual categories. In this category, "power", "swimming against the current", "whip", "the ordeal of the minimum wage worker", "the face of the worker we randomly see", "fighting ignorance", "work", "resisting", "life"., "life" metaphors were created.

- 15% of the participants used the metaphors of "ant", "seed", "deer in the wild", "energy", "sun" in the category of struggle as an effort to exist in nature.
- The metaphors of "character", "not giving up despite everyone", "book" were created in the category of struggle against oneself by 9%. The metaphors of "wave", "water drop", "baby", "fighting for your purpose", "success" were created in the category of struggle, 15% of which were determined as perseverance.
- According to the results of 15.1%, "arcade game", "game of chance", "war" metaphors were created in the category of struggle.

- Among the metaphors, the most created metaphor is “life” with 12.1%. The findings obtained as a result of this research are similar to the meaning of effort given in difficult situations during the National Struggle period, which is taught in the 4th grade Social Studies course.

When the literature was examined, no metaphor studies were found for the concept of struggle. However, there are different studies on the struggle. Gürses (2007), İncedal and Coşkun (2013), Tuğba and Hidayet (2000) talked about the economic situation of the struggle in their research on poverty reduction. Bengi (2011) examined the relationship between the independence struggles of countries and the national agency. Sarıçoban (2017) talked about the struggle and resistance of women in the national struggle in his research. When we look at these examples, we see that the struggle has many different aspects. These different aspects of the classroom teachers who participated in the research were also revealed and interpreted by creating various metaphors about the concept of "struggle".

Metaphors about the formation and operation of events are powerful mental tools. Metaphors are also described with the expression "language of experiences" in terms of making sense of people's personal experiences (Miller, 1987). In this respect, we can talk about the experiences that affect the mental perceptions of the classroom teachers in the metaphors they create. Classroom teachers use the concept of struggle with an exemplary expression: “Struggle is like life. Because we are always in a race. We are in a struggle with others, with ourselves, with life itself, to have something, to achieve something.” Yet another classroom teacher; “Fighting is like swimming against the current. Because you have to work hard to get where you want to be.” he states.

As a result of this research, the metaphor study with the classroom teachers revealed what the teachers' mental perceptions are. The fact that it is equivalent to the concepts used in the Social Studies course shows that the teachers have sufficient knowledge. Metaphors can be an important tool for teachers to use during education and to make sense of concepts that emerge with their mental perceptions. In this regard, teachers should use metaphors in their lessons. Different data can be obtained by conducting more comprehensive quantitative and qualitative research with classroom teachers, prospective classroom teachers, social studies teachers, and social studies teacher candidates. A comparative study can be made by taking the demographic information of the teachers. More detailed results can be obtained by conducting a focus group discussion with the concepts of "independence" and "struggle".

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Impact of Phonetic Factors on the Word Forms of the Albanian Language

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Abstract: Phonetics, through dynamic accent and other processes, such as: sound melting, sound additions, assimilations and reductions of different types has played a dual role: sometimes it has made the morphological forms simpler, sometimes it has made them more diverse. Phonetic interventions have often disturbed the paradigmatic system. The consequences of these interventions are conditioned by the system, but also by the nature of the grammatical morphemes and the final sounds of the themes. In any position, two boundary sounds cannot be pronounced the same as they are pronounced separately. Their pronunciation changes, even when they are pronounced in the middle of a word or at the beginning of it. The pronunciation of each pair of sound boundaries varies depending on the different types of combinations within the word. But the effects and changes in border sounds at the end of a word form are different. There the sounds are more resistant both to each other and to the composition of the representative form of the word as a whole, thanks to the grammatical values that have the corresponding final morphemes. Even though are not invulnerable. Preservation or change of final boundary sounds is conditional; even the consequences are different. In the case of impact, so their change, they adapt to each other or together they melt. In the case of their preservation, they require extra-structural support. This will be the object of this paper.

Keywords: Sounds, Phonetics, Albanian Language, Word Form

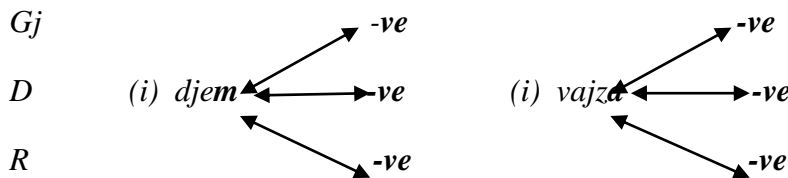
Introduction

The known and documented history of Albanian language testifies that some general developments and trends can help us explain what happened and what is going to happen with Albanian language word-building. These developments clearly show the line followed by Albanian word-building. As made evident, Albanian is mainly an analytical type of language.

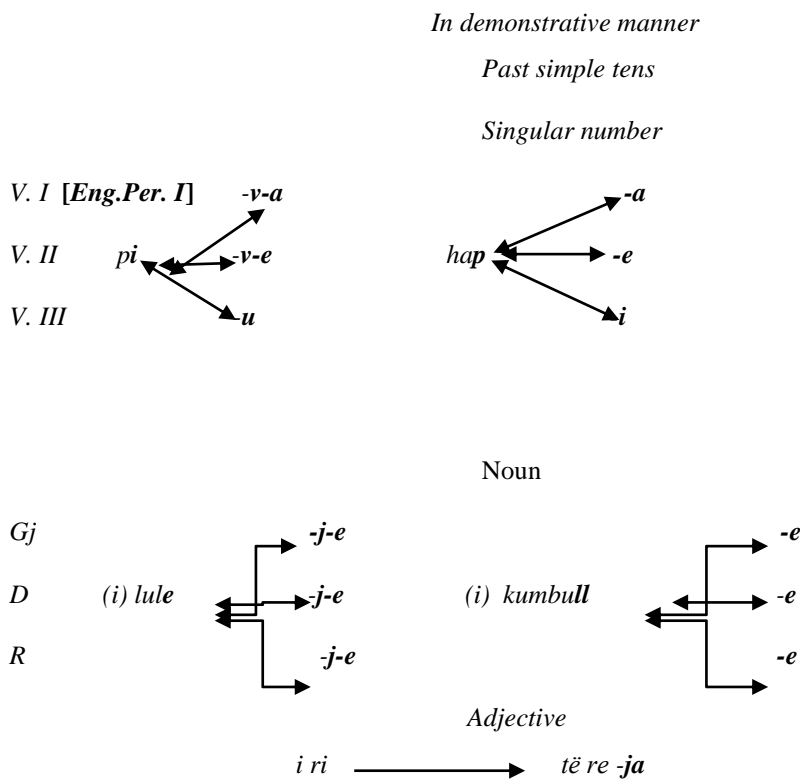
The most characteristic features of this trend are early reduction of declension system in singular and unification of declension in plural; unification and reduction of morphological adjective structure, unification of pronoun case forms; expansion and use of many analytical forms in the verbs system. Word building and compound words - which are subject of change each day - clearly show that word order is becoming more sustainable.

Antihatic sounds

Type of sound juncture limits also the type of sounds that facilitate this juncture. Thus, in case of difficulties between vowels, then the added sound is a consonant. In Albanian language, these consonants are: j, v and h. The obtained consonant v, created at the beginning as an antihatic sound in special word-forms, when the root of the word ends with a vowel, today is found in all roots of plural, therefore gaining only morphological features together with respective case endings.



Meanwhile, in the verb system, the simple perfect in first and second singular person of indicative mood, even though today is considered as a component of the respective ending, a preserve even the antihatic phonetic value, which is clearly noticed when the respective forms interact with third person singular, or with respective forms of verbs that end in consonants:



It is necessary to underline that only fricative consonants v, h and j, are used as antihatic sounds, which have the following special characteristics:

1. In general, linking of fricative consonants is expanded; while within the fricative consonants, the antihaptic consonants v, h and j have the same or very similar length. Value of length in v and h, e.g. are as following:

Value of length of v: 100 (ms)

Value of length of h: a little less than 100 (ms)

2. These two consonants are in compliance also with expansion of their frequency:

Expansion of frequency of v: apr.10000 (Hz)

Expansion of frequency of h: apr. 100000 (Hz)

3. Linking clitic is almost the same, therefore the air line during friction creates almost a similar noise.

Supporting sounds

The same phonetic function of antihaptic sounds is also associated to the supporting sounds, which various authors name "added" and "supporting" (Sh. Demiraj) or "anaptic", "euphonic", "parasite", "inorganic" or "non-etymologic sounds" (S. Riza). Therefore, even the differentiation in their nomination as "antihaptic" and "supporting" is not really related to the function but more to the phonetic nature of lateral sounds. In documented Albanian, as supporting sounds are i, u and ë. The analyzes and functions of these sounds, mainly in the diachronic plane, have been partial; not specific but embedded in word analysis. For the noun system, only S. Riza has paid special attention to these sounds in the work "Names in Albanian: The system of cases and types of inflection".

But the analysis is not complete and is limited to the old authors. However, the discussion there has dual values: it has the value of initiative and call for study; it also has value for the accuracy and analysis of the concrete linguistic material, chosen by the old authors. Despite the limited place that these sounds occupy in the above-mentioned work, the author has defined some rules and sub-rules of their use in the noun system. For the history of the development of this phenomenon, important is the conclusion reached by the author that the language disorders observed in their use or non-use are related to the "linguistic non-crystallization" of the anaptic and which, according to him, can be explained by:

1. "relative novelty" of the back nodes in the history of Albanian;
2. the non-ancient age of the anaphylaxis phenomenon itself.

If in the first case the explanation is debatable; in the second case -the explanation is true. From the Albanian of the old authors and from the explanations of S. Riza until today, the early "disorders" have become the rule. In standard Albanian the use of anaptic sounds is regulated according to generally accepted norms.

Their benefit belongs to the history of language; in today's linguistics they have become inseparable components of morphemes. Their use or non-use in the expression of the same morphological values, formally constructs the morphological pair of the respective allomorphs. Nominal system includes the following system of morphs,

where the structure of one of them includes a supporting sound:

in Singular

in feminine:

- -ës and -s, in genitive, -dative - definite ablative, such as respectively: kumbull -ës toward fushë -s, vegl -ës toward liri -së etc
- -ën and -n, in definite accusative, such as: kumbull -ën toward fushë -n, vegl -ën toward shtëpi -në etj.
- In masculine:
 - -in and -në in definite accusative, such as: djal -in toward vëlla -në;
- In neuter:
 - -it and -t in definite nominative and accusative, such as: të folur -it toward të nxënë -t, të ecur -it toward të të lënë -t etc
- in Plural
 - -ish and -sh in indefinite ablative, such as: nxënës -ish toward djem -sh, peshq -ish toward miq -sh etj.
 - -it dhe -të/ t for definite nominative and accusative, such as: nxënës -it toward djem -të, peshq -it toward miq -të etc.

Conclusions

1. Type of juncture of sounds also limits the type of sounds that facilitate this juncture. Thus, in cases of potential difficulties between two vowels, the added sound consists of a consonant. For the Albanian language such consonants are: j-, v- and h-.

2. The supporting sounds in Albanian language are i-, u- and ë-.

Their creation, in general belongs to the history of language because in modern linguistics they are transformed into unseparated components of a morpheme. Use of these sounds in endings creates at the same time also the series of respective morphs and allomorphs.

3. Use of ë as a supporting sound is not only related to acoustic and linking characteristics themselves, but also to the values it adds in a word form.

4. In the verbs system, during exchange, vowel I, beside its supporting phonetic function, gives the respective verb form also added morphological form distinguishing values.

5. Exchange of root ending -ë with the supporting sound -i-, noticed in verbal nouns in të nxënë -t në të nxën -i -t, does not play a morphological role, but just phonetic. Exchange and use of supporting vowel i instead of ë ,

happens due to more expressive phonetic reasons; thus, this replacement does not change the morphological value of the word-form.

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Examining the Opinions of Faculty Members on Online Exams with SWOT Analysis

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Abstract: This research aims to determine the strengths and weaknesses of the online exams, as well as the aspects that can be evaluated as opportunities and threats, by making a SWOT analysis of the online exams that are frequently used in the distance education process. For this purpose, the study was designed with the case study technique, one of the qualitative research methods. The research data were collected from academics who teach at the university and work in different titles and units. The questions prepared by the researcher, considering the factors related to the SWOT analysis, were presented to the participants as a structured interview form via an online form. Content analysis was used to analyze the data. The collected data indicate that online exams are powerful in terms of low cost, easy assessment, fast, and practicality. On the other hand, online exams have some weaknesses, such as technical problems, internet connection interruptions, difficulty with the exam preparation process, and security issues. Easy access to students and flexibility stand out as opportunities offered by online exams, while cheating was the biggest threat that the participants frequently mentioned. In the context of the results obtained, some solutions and suggestions are presented in relation to the relevant literature.

Keywords: Online exams, Distance education, SWOT analysis

Introduction

The COVID-19 epidemic, which affected the entire world in 2020, forced changes into every aspect of life, including education. In this period, distance education has suddenly become an essential concept in all fields (Abualhaija, 2022; Alshehri, 2022; Atabey, 2021; Atak, Yaşar, & Purzer, 2022; Atılgan, 2021; Ekin, 2022; Ghosh, Jansz, & Ghosh, 2022; Hu & Huang, 2022; Hu, 2021; Johar et al., 2021; Kibici, 2021; Kilincer, 2021; Liu & Cheng, 2021; Onuralp, 2021; Qi, 2021; Tsai, 2022; Ye, 2021). Moreover, all educational activities have been switched from face-to-face to online platforms due to the epidemic. The long course of the epidemic has brought about a long process of distance education activities, and online exams, which are an integral part of distance education, have become more used than ever before.

Distance education is a form of education designed with a systematic approach in which students and educators are structured independently of time and place (Gunawardena & McIsaac, 2004). In other words, it is a learning process in which students benefit from and stay away from the learning source regardless of time and place, and interaction is carried out with remote and online systems (Abood & Abu Maizer, 2022; Alshammari, 2022; Bertiz & Hebebcı, 2021; Habib & Morse, 2022; Ozturk, 2023; Özkul & Aydın, 2016). The key of success to such online and distance education is to use active learning activities with inclusion of peer learning, peer feedback, peer argumentation, and formative assessment activities (Latifi & Noroozi, 2021; Latifi et al., 2020, 2021; Noroozi, 2022; Noroozi et al., 2020; Valero Haro et al., 2019; 2022). This is also the case with online exams. Distance education, which was once considered a special form of education using non-traditional education systems, has become an important concept in the field of education today. Concepts such as networked learning, connected learning spaces, flexible learning, and blended learning systems have expanded the scope and revised the nature of previous distance education models. Web-based and web-enhanced courses are now emerging as traditional programs compete to join the “anytime, anywhere” educational nutrition craze (Gunawardena & McIsaac, 2004). Jones (1996) basically explained distance education as follows (Demir, 2013):

- The different locations of the teacher and the learner
- Organizing and designing the teaching material
- The use of the teaching material in a way that makes the teacher and the learner think together
- Use of bidirectional message transfer
- Learners’ personal realization of learning

Assessment tools used to measure the achievement levels of learners should contain features such as reliability, validity, practicality, objectivity, and distinctiveness. While measuring and evaluating, various methods such as written exams containing few open-ended questions or many short-answered questions, multiple-choice tests, oral exam practices, observation-experiment, projects, exercises, and assignments should be used (Yıldız & Uyanık, 2004).

Assessment and evaluation approaches are also critical in distance education. In face-to-face education, assessment and evaluation are mostly preferred with traditional (open-ended) exams. In distance education, the process evaluation approach is prioritized instead of the outcome evaluation approach. Various assessment and evaluation tools were used online during the emergency distance education period. These mainly include projects, assignments, and online exams (Ünsal, 2021). To that end, the Council of Higher Education in Turkey has announced a number of basic principles for online exams (YÖK, 2020).

Online exams are the online form of face-to-face exams. Through online exams, assessment and evaluation processes of learners’ skills, ability levels, knowledge levels, or competencies are carried out with information technology tools (Gülbahar, 2013). Online exams have advantages for both teachers and learners. These include low cost, fast implementation and fast results, implementation time flexibility, detailed statistics of results, low

assessment errors, more reliability, question pool, quick updating, analysis, the inclusion of multimedia-based content, and storage of applications (Dreher et al., 2011; Frankl & Bitter, 2012; Hewson, 2012; Kuikka et al., 2014; Sırakaya et al., 2015; Solak et al., 2020). On the other hand, some negative aspects of online exams are experienced. The requirement of a device with an internet connection for the implementation (mobile device or computer), the possibility of cheating in the exam, the possibility of the examiner being a different person than the person who should be, and security problems are also weaknesses of online exams (Anderson et al. al., 2005; Jung & Heon, 2000; Sırakaya et al., 2015).

Many different approaches and methods can be used to evaluate and/or analyze a situation. One of these methods is the SWOT analysis, which is produced from the initials of the words “Strengths - Weaknesses - Opportunities – Threats (Türegün & Kaya, 2019). Prof. Heinz Wehrich suggested SWOT analysis in 1982 (Wehrich, 1982:54). In this method, the strengths and weaknesses of an examined situation and the opportunities and threats that these aspects may pose are evaluated together (Arslan, & Kevser, 2021). In other words, it is a systematic method that helps determine a future strategy based on the situation examined (Güldiken, 2016). While the analysis reveals the strengths to take advantage of the opportunities, it also provides information on what can be done to strengthen the weak sides and take precautions against possible threats (Erçetin, 2019).

Significance of the Research

COVID-19 has dramatically highlighted the importance of distance learning for the sustainability of education. Assessment and evaluation, one of the most important parts of education, were generally carried out online based in this process. However, online exams have brought many concerns, especially cheating and lack of infrastructure (Bilen & Matros, 2021; Fask et al., 2014; Golden & Kohlbeck, 2020).

With the onset of the COVID-19 epidemic, the number of studies on distance education has increased rapidly in the literature (Hebebcı, 2021; Kibici, 2021; Unger & Meriran, 2020). However, this situation does not apply to distance education studies for online exams. In this respect, it is vital to evaluate online exams from a general perspective and evaluate the opportunities and limitations they provide, as well as their strengths and weaknesses, and guide future studies in this field.

Purpose of the Research

This research aims to examine instructors’ opinions about online exams, which are frequently used in the distance education process, with the SWOT analysis approach. In this context, this research seeks answers to the following research questions:

1. What are the strengths of online exams?
2. What are the weaknesses of online exams?

3. What are the opportunities provided by online exams?
4. What are the threats caused by online exams?

Method

Qualitative methods were used in this research due to their potential to provide in-depth information. In the design of the research, the case study was preferred, which allows focusing on an existing situation (Cresswell, 2013).

Study Group

The study group of the research consists of 7 instructors actively working with different genders, branches, titles, and professional experiences. Purposive sampling was used in the formation of the study group. The demographics of the study group are shown in Table 1.

Table 1. Demographics of the Study Group

Variable		f	%
Gender	Male	4	57.15
	Female	3	42.85
Department	ICT	2	28.57
	Civil engineering	2	28.57
	Educational sciences	2	28.57
	Computer engineering	1	14.29
Title	Prof. Dr.	1	14.29
	Assoc. Prof. Dr.	1	14.29
	Assist. Prof. Dr.	2	28.57
	Res. Assist.	1	14.29
	Lecturer	2	28.57
Experience	7-10 years	1	14.29
	10 years and more	6	85.71

Table 1 indicates that there are 3 females (42.85%) and 4 males (57.15%) regarding the gender variable, while there are instructors from ICT (f=2; 28.57%), civil engineering (f=2; 28.57%), educational sciences (f=2; 28.57%) and computer engineering (f=1; 14.29%) in terms of departments. Most of the instructors have 10 years or more experience (f=6; 85.71%) and have different titles (Table 1).

Data Collection Tools

Personal Information Form, which includes demographics such as gender, department, title, and professional

experience of the participants, and a structured online exam evaluation form developed by the researchers were used as data collection tools in the research.

Data Analysis

The collected data were first reviewed by both researchers and prepared for analysis. Then, it was analyzed by content analysis within the steps of SWOT analysis.

Validity and Reliability

Expert opinion and member checking were used to ensure validity (Yıldırım & Şimşek, 2011). Additionally, the percentage of agreement of Miles and Huberman (1994) was examined. As a result of the percentage agreement, a high value such as 95.2 was found (70% and above is considered sufficient).

Findings

Findings Regarding the Strengths of Online Exams

Information on the answers given by the instructors about the strengths/superiorities of the online exams is shown in Table 2.

Table 2. Findings Regarding the Strengths of Online Exams

Category	f	%
Convenience	5	29.4
Speed and practicality	4	23.5
Low cost	4	23.5
Archiving and Storage	2	11.8
Time-space independence	2	11.8
Total	17	100

Table 2 suggests a notable point that the points emphasized by the instructors are the convenience of online exams (f=5; 29.4%), speed and practicality (f=4; 23.5%), and low cost (f=4; 23.5%). Some of the direct quotations of the opinions obtained in this context are as follows:

“Since exams are conducted in a completely digital environment, this provides convenience in the assessment and evaluation process, and exam results can be easily announced.” -Inst5

“It helps quick finalization and offers easy modification.” -Inst2

“...Loss of time and financial losses (food, travel fee, etc.) spent when going to school or exam center, as well as no paper costs.” -Inst6

“... Compared to the classical exam, it is easier and cheaper for students to store and achieve answer

sheets.” -Inst2

“Students can determine the most suitable exam environment for them....” -Inst7

Findings Regarding Weaknesses of Online Exams

In line with the opinions obtained from the instructors, information on the weaknesses of the online exams is given in Table 3.

Table 3. Findings Regarding the Weaknesses of Online Exams

Category	f	%
Security (Help from outside, cheating)	6	50
Technical and infrastructure problems	2	16.6
Student monitoring	2	16.6
Validity and reliability	1	8.4
Long preparation time	1	8.4
Total	12	100

All instructors except for one underlined that the biggest weakness of online exams is the security (f=6; 50%). The security problem mentioned here is the possibility of students getting help from someone or various sources or cheating. In addition to this, other weaknesses mentioned are technical and infrastructure problems, student monitoring, long preparation process, and validity and reliability. Some of the direct opinions received from the instructors are given below:

“It is out of our control that the student gets help and cheats during the exam. From the moment the student takes the exam, they can get help and cheat by using other means....” -Inst3

“It is challenging to ensure validity and reliability in online exams. There is a high probability of students cheating, and it is very difficult to catch.” -Inst5

“Not being able to follow the student, the increase in complaints when the internet is disconnected, and this cannot be proven, the exam preparation takes time because it is done over the system.” -Inst2

Findings Regarding the Opportunities Offered by Online Exams

Information on the answers given by the instructors about the opportunities offered by the online exams is shown in Table 4.

Table 4. Findings Regarding the Opportunities Offered by Online Exams

Category	f	%
Speed and convenience	3	30
Sustainability	2	20
Saving	2	20
Archiving and storage	1	10

Technology literacy	1	10
Fair assessment	1	10
Total	10	100

The findings regarding the online exams reveal that the instructors have different opinions on the opportunities offered by such examinations (Table 4). In this context, the major categories are speed and convenience (f=3; 30%) and sustainability (f=2; 20%), which are followed by the categories of saving, archiving and storage, technology literacy, and fair assessment, respectively. Some of the direct opinions collected from the instructors are as follows:

“It ensures that exams can be held when epidemic diseases increase, such as during the pandemic period, and when students and instructors need to be in their own environment.” -Inst5

“While the number of digital exams is increasing day by day (such as E-YDS), it is an opportunity for our students to be prepared for such digital exams. It can also raise the technology literacy.” – Inst6

“Evaluation of the exam even becomes fairer and faster” -Inst7

“Time, labor, and consumable savings take place (paper, optical forms, etc.).” -Inst3

Findings Regarding the Threats Caused by Online Exams

Information on the dangers and threats caused by online exams is given in Table 5, in line with the instructors’ opinions.

Table 5. Findings Regarding the Threats Caused by Online Exams

Category	f	%
Security (Help from outside, cheating)	6	75
Interaction	1	12.5
Lack of control	1	12.5
Total	8	100

It is seen that almost all of the instructors regarding the Threats Caused by Online Exams focus on security (Table 5). When the answers given in this direction are examined, it is seen that the general concern of the instructors is cheating in the exams (f=6; 75%). Some of the comments received under this heading are as follows:

“...I think that most of the students did not complete the exams with their own efforts. For this reason, I think that they did not get enough knowledge and skills from these courses and an inadequate generation emerged in these fields.” -Inst3

“...in an uncontrolled environment, it increases the likelihood that more students will expect to cheat... they may seek to develop new methods of cheating. In addition, new and uncontrolled communication

channels that can be used in cheating among students can develop.” -Inst5

“No interaction at all during the exam. The fact that children born in the digital age are completely disconnected from interaction, asocial, and lacking in self-confidence.” -Inst6

Discussion and Conclusion

In this study, a SWOT analysis was made using the instructors’ opinions for the online exams applied intensively during the COVID-19 period. The instructors’ opinions were divided into categories under the four headings of the SWOT analysis. Thus, a general perception of online exams was aimed to be revealed. In the SWOT analysis, the three most frequent answers given by the instructors for each theme are shown in the SWOT matrix in Figure 1. The SWOT matrix can be explained as a structure in which strengths and weaknesses, opportunities, and threats are given holistically, and various combinations can be created from this (see Figure 1).



Figure 1. SWOT Matrix

Based on the research findings, it was concluded that the strengths of online exams are convenience, speed, practicality, and low cost within the scope of the instructors’ opinions. Online exams, which take their place in education with distance education, have benefits for both students and educators. Obtaining results quickly, saving time and cost, storing and archiving, and minimizing human errors are some of the prominent benefits for educators (Angus & Watson, 2009; Kughtman, 2004). When the opinions in this study are examined, it is

seen that the instructors generally make the evaluation from their own perspective. This may be due to the use of a structured interview form in the research.

Online exams bring with them many advantages as well as disadvantages. The weakness often mentioned in this research is that online exams have a serious security vulnerability. This issue has also been discussed in the literature (Dermo, 2009; Stuber-McEwen et al., 2005). Almost all of the instructors think that students cheat during online exams. There are studies with similar results in the literature (Kennedy et al., 2000; Rogers, 2006; Stuber-McEwen et al., 2005). To this end, most of the participant educators in Rogers (2006) and who benefited from online exams in their lessons noticed at least one cheating or cheating attempt in every online exam. However, there are also studies that suggest the opposite. These studies highlight the potential difficulty of finding tangible evidence of cheating in an online exam (Fask et al., 2014; Watson & Sottile, 2010). Similarly, Farzin (2016) states in their study that online exams reduce the possibility of cheating by the opportunity to ask different questions of a similar nature to each student.

The first three opportunities offered by online exams are speed and convenience, sustainability, and savings. It is seen that these categories stand out among the advantages of online exams. It is known that when sufficient conditions are provided, conducting the exams online brings many opportunities. Various sources emphasize that online exams prevent the waste of paper, effort and time caused by traditional exams (Kuikka et al., 2014). Besides, the fact that education and exams are sustainable under all conditions provides an important convenience for the normal course of life. In that sense, Hebebe et al. (2020) mentioned the positive effects of continuing education activities even in the worst conditions.

The first three threats caused by online exams are security, interaction, and lack of control. Under this category, it is noteworthy that the biggest concern of educators is cheating. Studies in the literature emphasize the threats posed by online exams (Abdelrahim, 2021; Ullah et al., 2016). Adapting to the sudden transition to distance education, providing the necessary infrastructure, and activating the distance education application and research centers that are inactive in many places have taken some time for universities. In this process, assessment and evaluation were made with online exams and homework to ensure the continuity of education. However, as time passed, it became a matter of debate whether the measurement and evaluation methods applied with the education given were effective (Ezginici, 2020). In this context, the discussions on the security of online exams are expected to continue. The interaction problem, one of the important problems in online environments, is another key finding in this study. Significantly, there are contradictory statements about student monitoring. While some instructors think that it is easy to monitor in online environments, others claim the opposite.

Consequently, it is indisputable that online exams gave their first serious test unprepared for the COVID-19 pandemic. The sudden confrontation of almost the whole world with such an important issue and the inability to give the necessary reflex has led to opposing opinions and prejudices towards online exams. Some research results also support these arguments. However, considering the adventure of distance education that started with writing a letter and how quickly its transformation into synchronous online classes took place, we can claim that

online exams will be much better in their current position in a short time. Compared to traditional exams, the superiority of objective and fast assessment, saving, and archiving will make online exams a permanent part of education life in the near future. Within the scope of this study, the following recommendations for research and practice can be presented:

- The number and quality of studies on security measures in online exams should increase.
- Attempts can be made to solve existing infrastructure and technical problems.
- Research can be conducted on different methods and techniques that focus on online exams.

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Representations of Qualifying Secondary Teachers Regarding the Investigative Approach in Morocco

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Abstract: The innovation calls insist on the fact to identify new forms and models of learning and teaching. Actually, the educational approaches that encourage effective learning among student, is the Investigative Approach, which demonstrates more and more its potential in teaching. It is a scientific approach based on questioning and investigation where the learner is placed at the center of the action of learning questions himself, acts in a reasoned manner and communicates to build his learning while by being an actor in scientific activities. In this research, we aim to highlight the representations of secondary school teachers about the concept of investigative approach and determine the constraints and the obstacles to its implementation in the teaching of experimental sciences disciplines (Science of life and earth, Science of physics and chemistry). In order to achieve these objectives, a questionnaire was drawn up and was the subject of an exploratory study among 100 teachers of experimental sciences practicing in different secondary schools in Marrakech city. The results of this survey reveal, firstly, that the teachers questioned seem have confusions and misconceptions about the investigation process and secondly, they highlight the presence of constraints and difficulties that prevent its application in the classroom.

Keywords: Investigative Approach, Misconceptions, Learning, Teaching.

Introduction

Everyone is currently aware that the current science teaching does not yield the expected results. It is no longer a question of training only scientists but also of enabling scientific acculturation of citizens living in a world where science and technology have a preponderant place. This is why, from an institutional point of view, many voices have been raised in recent years to call for a renewal of this teaching.

Actually, the Investigative Approach is among the most popular educational approaches that encourage effective learning. It is a scientific approach based on questioning and investigation where the learner is placed at the center of the act of learning questions himself, acts in a reasoned way and communicates to build his learning being an actor in scientific activities (Darley, 2007).

This approach is not new (Lebeaume, 2011). Indeed, this scientific method has been integrated for more than a century in science curricula in many countries, particularly English-speaking countries such as England and the United States (Hasni & Bousadra, 2016). In France, situated in the continuity of the approach of the scientific approach and initiated with “La Main à la Pâte” in 1996 (Coquidé et al., 2009). The Investigative Approach have been gradually integrated. Indeed, this approach was adopted at primary school in 2000, at middle school in 2008, at high school in 2009 and in general second classes in 2010 (Grangeat, 2014). The Investigation Procedures have been declined, put into text and implemented in different ways. Thus, for example in the United States with various versions (Inquiry-Based Science Education: IBSE; Inquiry-Based Instruction: IBI; Inquiry-Based Teaching: IBT) and in France, they use the term of Investigative Approach. These varied variations can certainly be related, at least partially, to distinct historical and cultural references (Calmettes & Matheron, 2015). This approach is part of a socio-constructivist perspective, promoting exchanges between students in order to build their own knowledge (Hassouni et al., 2014). Such approach also points to the use of participatory active learning activities for students to foster their higher-order skills such as the use of peer learning, peer feedback, peer argumentation, and problem-solving tasks, (see Latifi & Noroozi, 2021; Latifi et al., 2020, 2021; Noroozi 2018, 2022; Noroozi et al., 2016; 2020; Valero Haro et al., 2019; 2022). In this sense, Morocco has been part of reforms policy since 2003, which aimed essentially the generalization of learning, the improvement of its quality that including the educational content and the restructuring of education cycles. However, several studies in science education have shown the presence of a set of difficulties, which are linked to the knowledge, taught, to the representations of students and teachers on science and to the pedagogical practices of teachers in the classroom (Kouchou et al., 2019).

This study is part of research into the application of the Investigative Approach in science education in Morocco. Through this study we aim to highlight the representations of secondary school teachers qualifying on the concept of Investigative Approach, to see if this approach is adopted or not in the teaching of experimental science disciplines (Life and Earth Sciences, Sciences of physics and chemistry) and finally to determine the constraints and obstacles to its implementation. In order to achieve these objectives, we have adopted the methodology described below.

Method

The basic tool of this study is a survey in the form of a questionnaire followed by semi-structured interviews. The questionnaire was developed in two stages: in the first, the questionnaire consisted of 10 questions, some of which were closed questions and others were multiple-choice questions asking teachers to express themselves on the Investigation Approach. The questions formulated focused on three axes:

1. Teacher’s representations about the investigation approach.
2. Adoption or not of the investigative approach by teachers and its implementation in the classroom.
3. The difficulties that hinder the implementation of this approach in the classrooms.

The data collected was very minimal because the teachers showed resistance which they justified by the length of the questionnaire. However, through the interviews, we were able to deduce that they did not want to engage in the responses because the Investigative Approach terminology seems unfamiliar to them and they are not familiar with this term. After a discussion on the topic with a group of teachers, the questionnaire was reformulated and the number of questions was limited to six to simplify their formulation.

The study was carried out in several public high schools in the city of Marrakech (Morocco), during the 2020-2021 school year. Our target population consists of 100 qualified secondary school teachers. To test the internal consistency and reliability of the questions, Cronbach's Alpha values were calculated. The Cronbach's alpha of our questionnaire is equal to 0.85. Our Cronbach's alpha falls between 0.73 and 0.94 the range of Cronbach's alphas reported in previous studies (Manis & Choi, 2019; Peterson, 1994), indicating discriminant validity of our questionnaire. To continue the validation of our questionnaire we started with a pilot study for a sample of 50 teachers to modify and restore our questionnaire. Knowing that we administered 300 and we were able to have only 100 completed questionnaires.

Results

Q1. Give the appropriate definition of the Investigative Approach

In this question (Q1), teachers were asked to choose the correct answer concerning the definition of Investigative Approach; we found a heterogeneity of answers. In fact, 36% of teachers opted for the answer stipulating that Investigative Approach is an approach based on investigation concerning students' learning obstacles (a) and 14% of teachers affirm that the investigative approach is a process of learning of scientific content (b). On the other hand, 50% of teachers chose the most correct answer, namely the scientific approach to questioning and investigation, which constitute scientific disciplines. Students question themselves, act in a reasoned way and communicate to build their learning by being actors in scientific activities (c) (see Figure 1).

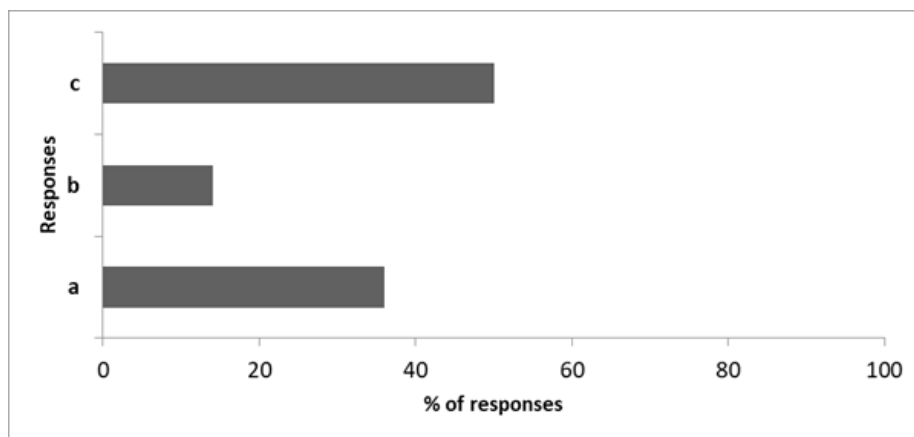


Figure 1. Investigative Approach Definition

- a: Approach based on investigation concerning students' learning obstacles.
- b: Investigative approach is a process of learning of scientific content.
- c: The scientific approach to questioning and investigation, which constitute scientific disciplines. Students question themselves, act in a reasoned way and communicate to build their learning by being actors in scientific activities.

Q2. Is there a difference between Investigative Approach and Experimental Approach?

For this question (Q2), we found that 54% of teachers affirm that there is no difference between the investigative approach and the experimental approach and say that the investigative approach is the experimental approach. . On the other hand, 36% of teachers say that there is a difference between two approaches and this difference is linked to the steps of each approach, which differs from the other (see Figure 2).

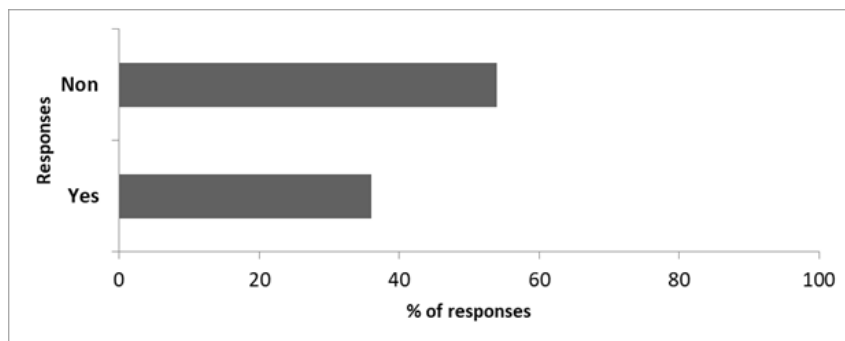


Figure 2. Teacher’s Responses Regarding Difference between the Investigative Approach and The Experimental Approach

Q3. Have you ever benefited from a continuous training concerning the Investigative Approach?

For this question (Q3), we found that 67% of teachers had no training in the inquiry process. The proportion of teachers who claimed to have already received training in this regard does not exceed 33% (see Figure 3).

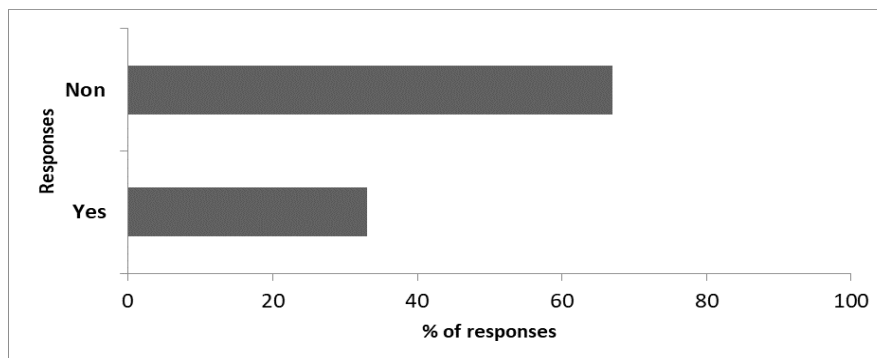


Figure 3. Teacher’s Responses regarding Continuous Training on the Investigative Approach

Q4. Do you adopt the Investigative Approach in your teaching?

According to the data collected for this question (Q4), 52% of teachers affirm that they do not adopt the Investigative Approach in their teaching. In contrast to 48% of teachers questioned who admit having used this approach. Unfortunately, this gives us no indication of the actual practice of this approach in the classroom (see Figure 4).

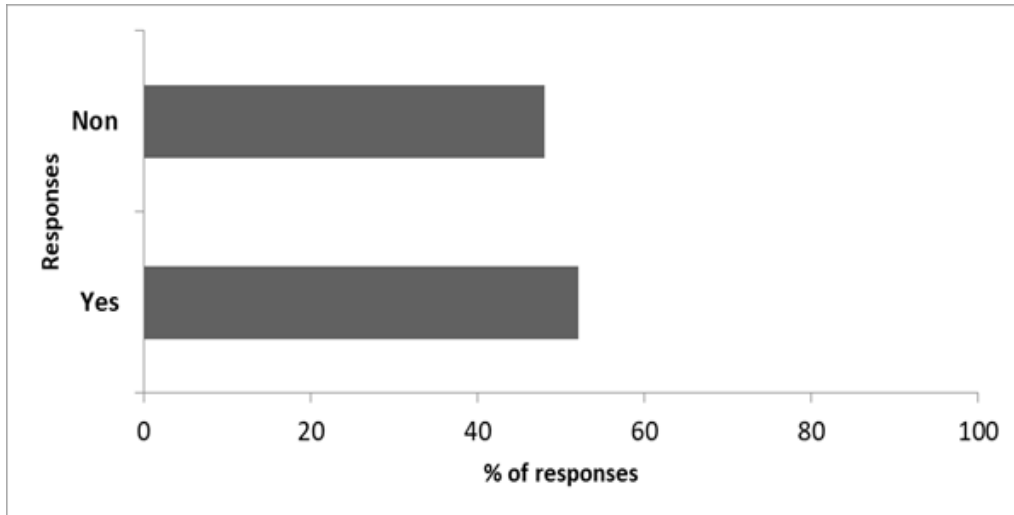


Figure 4. The Adoption or Non-Adoption of the Investigative Approach in Classroom

Q5. If yes, do you adopt it for all scientific contents?

According to the data collected for this question (Q5), 76% of the teachers affirm that they adopt the Investigative Approach in many scientific contents and that with the opposition of 24% of the questioned teachers who affirm having resorted to this approach in the all-scientific contents (see Figure 5).

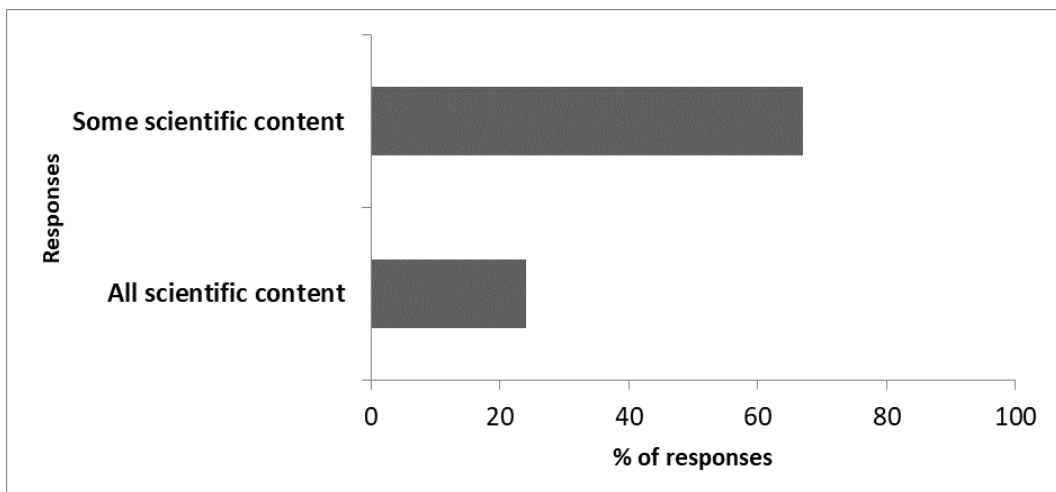


Figure 5. Teacher's Responses Regarding Adoption of The Investigative Approach in The Scientific Contents

Q6. What are the constraints that prevent the adoption of Investigative Approach?

In order to have some answers on the constraints that prevent the adoption of this approach in secondary school classes (see Figure 6), we formulated the question (Q6) which consists of 4 items: the overloaded program (a), the lack of the student’s autonomy (b), the overload of the student’s number (c) and the lack of continuous training for teachers (d).

Relying on the answers obtained, we notified that 49% of the teachers questioned affirm that the constraints limiting the adoption of this approach in the classes are multiple: the overloaded program (a), the lack of the student’s autonomy (b) and the overload of the number of student’s (c). 20% of teachers say that the lack of continuous training (d) about this approach could limit the adoption of this approach by teachers in secondary classes. A percentage of 18% of teachers affirm that the overload of the number of student’s (c) is the main cause limiting the adoption of the Investigative Approach in learning and finally 13% of teachers affirm that it is due to the overloaded program (a) (see Figure 6).

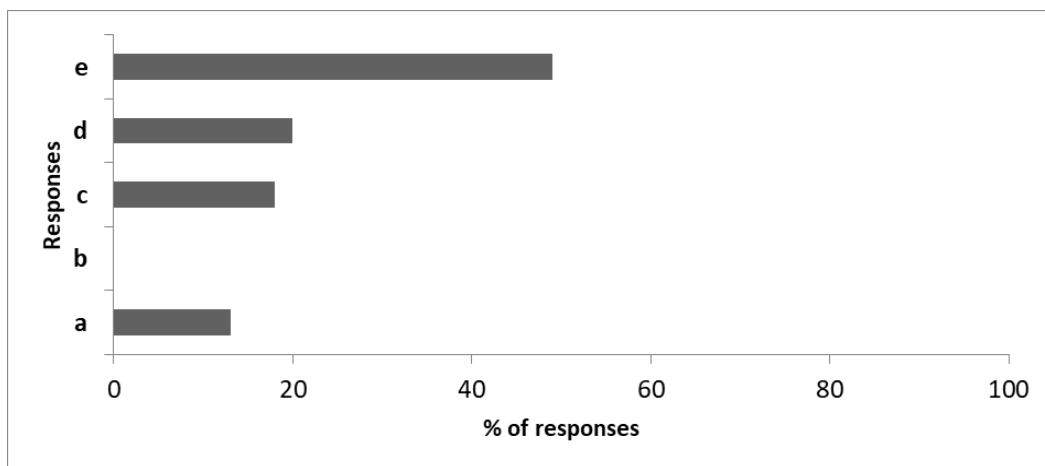


Figure 6. Constraints that limit the adoption of the Investigative Approach

- a: Overloaded program
- b: Lack of the student’s autonomy
- c: Overload of the number of students.
- d: Lack of continuous training
- e: All choices

Discussion

According to the question (Q1) related to the representations of the teachers interviewed on the Investigative Approach, it seems that the latter have erroneous representations and confusion concerning the correct definition of the Investigative Approach. Indeed, almost half of the population questioned opted for the incorrect

formulations, namely that this approach is an approach based on the investigation of the learning obstacles of students, and a process of learning scientific content. This is despite the fact that these teachers affirmed during the semi-directed interviews that they had already heard of this approach. These data show that a priori, teachers' representations can hinder the implementation of this approach in the classroom. These data are corroborated with a study conducted by Kouchou et al. (2017) who highlighted the presence of erroneous representations among teachers regarding the investigative approach.

In question (Q2), almost half of the teachers affirm that there is no difference between the investigative approach and the experimental approach. They say that the investigative approach is the experimental process. These results correlate with those obtained in research at the national level (Kouchou et al., 2017) and in other international education systems (Coupaud, 2014; Boilevin, 2013; Boilevin and Brandt-Pomares, 2011), which show that Teachers of different disciplines (Life and Earth Sciences, Physical and Chemical Sciences, Technology) sometimes perceive differently the notion of the Investigative Approach.

The data for question (Q3) show that the majority of teachers have not received a continuous training on Investigative Approach. Indeed, the lack of continuous training on new pedagogical approaches, and in particular on Investigative Approach, can be at the origin of the erroneous representations identified among the teachers surveyed. This finding is consistent with a study by Boilevin et al. (2016) which underlined that training on this approach is a necessity and a declared need by teachers. The results obtained from the question (Q4) shows that the teachers surveyed do not adopt this approach, it seems that these teachers are reluctant to change their working methods. Resistance to change and refusal of new pedagogical methods has already been reported by researchers in other contexts such as Boilevin et al (2012) and Kouchou et al (2017), who revealed that teachers are not interested in changing their teaching method and therefore do not adopt the Investigative Approach.

The answers of the teachers to questions (Q5) and (Q6) show a multiplicity of difficulties and constraints that can limit the implementation of the Investigative Approach in classes, namely: the overloaded program, the lack of the student's autonomy, the overload of the student's number and the lack of continuous training for teachers. These results are consistent with data from the literature which reveal that teachers face multiple difficulties (time and overloaded schedule; lack of student autonomy) to implement this practice (Kouchou et al., 2017 ; Boilevin et al., 2012 ; Venturini & Tiberghien, 2012 ; Jameau, 2012 ; Gyllenpalm et al., 2010 ; Calmettes, 2007, 2008, 2009; Vlassis et al., 2002).

Conclusion

The analysis of the results of this survey revealed the presence of the erroneous representations among teachers concerning the definition of the Investigative Approach. Indeed, the reason behind these erroneous representations is the fact that teachers find it difficult to implement it, especially since they have received little

or no training on this new approach. On the other hand, the presence of a set of constraints and difficulties hindering the implementation of this approach in class by teachers. These constraints are linked to the overload of the number of students, the lack of student's autonomy, the overloaded program and the lack of continuous training.

The erroneous representations as well as the constraints stated throughout this study underline the importance of the continuous training for the teachers on the new approaches in particular the Investigative Approach. Accordingly, training allows them to go beyond their initial representations to become aware and train in new pedagogical approaches to adopt them correctly in the teaching of scientific content.

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Research Anxiety Levels of Education Faculty Students

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Abstract: Scientific research is the process of collecting, analyzing, interpreting, evaluating, and reporting data in a planned and systematic way in order to find reliable and valid solutions to problems. Anxiety about scientific research directs the research behavior of the individual and causes feelings such as reluctance to do research, insecurity, discomfort, and restlessness. Universities are important institutions where research culture should be introduced to students. In this study it is aimed to determine the research anxiety levels of education faculty students. The participants were 615 students (289 females and 326 males) who are the students at different departments of education faculties from ten universities in Turkey. The data were gathered by using “Research Anxiety Scale”. The findings showed that the research anxiety levels of education faculty students are not very high almost moderate level. Also, research anxiety levels of the students explored in some variables. It is found that education faculty students’ research anxiety levels did not change according to gender, whether they took a research course, their studying department or grade levels.

Keywords: Research Anxiety, Pre-Service Teachers, Anxiety

Anxiety is the emotional state that accompanied by unpleasant physiological symptoms such as fear or worry. It is defined as “... a complex network of different elements - cognition, emotion, biology, behavior and environment - which are linked and trigger one another off” (Sanders, 2003, p. 4). Research anxiety, on the other hand, arises with behaviors such as not doing research unless it is necessary, feeling bored when it is needed to make research, the thought of doing research disturbs the individual, the individual generally feels uneasy while doing research, and the individual does not trust himself/herself in researching (Cokluk-Bokeoglu & Yilmaz, 2005). Making academic research may be stressful, anxiety-producing, and sometimes depressing for students (Tindall, Fu, Tremayne, & Curtis, 2021). Lei (2008) stated that a high level of research anxiety reduces the sense of self-efficacy and causes people to develop a negative attitude towards research. Also it reduces academic performance (Onwuegbuzie & Wilson, 2003).

One of the two main functions of universities is education and the other is to do research. In order to sustain research activities, it is important and necessary that individuals and institutions that will conduct research, as well as the appropriate research environment, have research competencies and positive attitudes that make it possible to do this work. Rapid and continuous developments in the world require teacher candidates to be aware of the importance and necessity of doing research in order to respond to the expectations in their field.

Undergraduate education is an important stage in which the basic perspective and skills about doing scientific research are gained. Assuming that high anxiety will negatively affect research success, it is important to determine whether students have research anxiety in order to take necessary precautions. This study is important in that the academicians and field experts who give lectures to students working in the faculty of education realize the deficiencies of the students about making research, if any, and take actions to eliminate their deficiencies and these concerns.

There are studies investigating the research anxiety of students in different levels and departments Kartal & Hızlıođ, 2021; Aslan & Karagul; Tekin, 2007; Cokluk-Bokeoglu & Yılmaz, 2005; Saracaloglu, Varol & Ercan, 2005; Onwuegbuze & Wilson, 2003; Büyüköztürk, 1997). According to the study designed to determine the research anxiety levels of the faculty of science and literature graduates conducted by Yılmaz and Cokluk (2010), it was found that the research anxiety of the graduates is not very high. Tekin (2007), in his study, determined that the research anxiety of postgraduate students is high, and as the anxiety levels of the students' increase, their research proficiency levels decrease. Aslan and Karagul (2016) examined the anxiety levels of graduate students in Turkish language education program about carrying out scientific research and found anxiety levels of students were moderate. According to the study to determine the anxiety levels of graduate students towards scientific research conducted by Bayar et al. (2013) it was concluded that students' research anxiety was low.

In this study, it is planned to explore the research anxiety levels of education faculty students and to examine this anxiety levels in terms of various variables. In line with this general purpose, the research questions are as the following:

- What is the research anxiety levels of the students studying in the education faculties?
- Do the students' research anxiety levels differ according to gender, taking a scientific research course, departments and grade levels?

Methodology

This study, which aims to examine the anxiety levels of students studying at the faculty of education towards doing scientific research in the context of various variables, is a descriptive study and the study is in the comparative relational survey model (Karasar, 2005).

Participants

The study participants consisted of education faculty students from ten different universities in Turkey. From the total of 615 students 47% (n=289) were female and 53% (n=326) were male. Participants were from different grade levels and departments of education faculties from ten different regions. The distribution by universities is detailed in Table 1. 231 of the students are in 1st grade, 162 of them are in 2nd grade, 122 of them

are in 3rd grade and 100 of them are in 4th grade. Considering whether the students took a course for scientific research or not, it was revealed that 54.1 % (n=333) students took such a course, and 45.9 % (n=282) students did not take a research-oriented course. In the study the undergraduate programs of the participants were grouped as numerical and verbal. Numerical group consisted of mathematics and science education departments, and computer education and instructional technology departments; whereas verbal group consisted of pre-school education, and language education departments and social sciences education departments.

Table 1. Demographics of the Participants in the Study

Gender	N	%
Female	289	47
Male	326	53
Grade Levels	N	%
1st	231	37.6
2nd	162	26.3
3rd	122	19.8
4th	100	16.3
Taking a scientific course	N	%
Yes	333	54.1
No	282	45.9
Departments	N	%
Verbal group	208	33.8
Numerical group	407	66.2
Universities	N	%
Adnan Menderes University	73	11.9
Akdeniz University	27	4.4
Amasya University	65	10.6
Ankara University	27	4.4
Atatürk University	41	6.7
Gazi University	87	14.1
Kocaeli University	82	13.3
Mersin University	18	2.9
Ondokuz Mayıs University	104	16.9
Pamukkale University	91	14.8
Total	615	100

Instruments

Data were gathered by “Demographic Information Form” and “Research Anxiety Scale”. In the demographic

information form, there are questions to gather the demographic information of the participants including gender, university, study department, grade levels and whether they took a course related to scientific research. In the second section, the participants' research anxiety was gathered by Research Anxiety Scale developed for undergraduate students by Büyüköztürk (1997). The instrument had 12 Likert type items. 5 items (2,3,4,8,11) were positive items (not expressing anxiety) and other 7 items (1,5,6,7,9,10,12) were negative (expressing anxiety) and thus reversed during coding. The reliability coefficient of the instruments was calculated $\alpha=.87$ (Büyüköztürk, 1997). These items are included in the analysis by reverse coding. A minimum of 12 and a maximum of 60 points can be obtained from the scale. Thus, a high score from the scale indicates that the research anxiety is low, while a low score indicates that the person has anxiety about doing research.

Data Analysis

Data used in the study have been obtained via online form. In the study, SPSS 18 version of a statistics package program was used. Descriptive statistics and relational analyzes were used to analyze the collected data.

Results

Findings regarding the research anxiety levels of education faculty students

Participants' general scores of research anxiety were calculated using descriptive statistical methods. As seen in Table 2, the arithmetic mean of the 12-item scale of the group consisting of a total of 615 students is 42.83 and the standard deviation is 8.64. The findings show that the research anxiety of the undergraduate students participating in the research are not very high or low and it is close to average ($\bar{X}=42.83$, $SS=8.64$).

Table 2. Faculty of Education Students' Research Anxiety Levels

	<i>N</i>	<i>Minimum</i>	<i>Maximum</i>	\bar{X}	<i>SS</i>
Research Anxiety	615	12.00	60.00	42.83	8.64

Descriptive statistics regarding the scientific research anxiety scale items and the scores obtained from the scale are shown in Table 3. As can be seen in the table the item with the highest participation of the participants is "Even the word research is enough to make me uneasy" ($\bar{X}=4.01$, $SS=1.05$). The item with second highest participation is "Even the thought of doing research makes me nervous" ($\bar{X}=3.96$, $SS=1.07$) and third highest participation is "I do not have the confidence to do research" ($\bar{X}=3.86$, $SS=1.11$).

The item with the lowest participation of the students is "Problems that may arise while doing research do not cause significant anxiety on me" ($\bar{X}=2.98$, $SS=1.12$). The item with the second lowest participation is "I quickly get tired of doing research" ($\bar{X}=3.36$, $SS=1.10$) and the third lowest participation is "Making research is a fun hobby for me" ($\bar{X}=3.42$, $SS=1.07$).

Table 3. Faculty of Education Students' Frequency and Percentage Distribution Regarding Statements in the Research Anxiety Scale

		N	\bar{X}	SS
1	I don't want to do research unless I have to.	615	3.43	1.12
2	I usually feel comfortable doing research.	615	3.54	1.10
3	I take great pleasure in doing research.	615	3.46	1.07
4	Doing research does not cause me any discomfort.	615	3.55	1.14
5	I feel bored when I have to do research.	615	3.43	1.16
6	Even the word research is enough to make me uneasy.	615	4.01	1.05
7	Even the thought of doing research makes me nervous.	615	3.96	1.07
8	Making research is a fun hobby for me.	615	3.42	1.07
9	I often feel restless while doing research.	615	3.83	1.04
10	I quickly get tired of doing research.	615	3.36	1.10
11	Problems that may arise while doing research do not cause significant anxiety on me.	615	2.98	1.12
12	I do not have the confidence to do research.	615	3.86	1.11
Total		615	3.57	

Findings regarding the education faculty students' research anxiety differs according to gender

In order to understand whether the scores of women and men from the anxiety scale differ statistically, firstly, the distribution of the data obtained from the scale was examined. Since the data did not show normal distribution Mann-Whitney U test was applied in the analysis. Results revealed there is no statistically significant difference was found between the research anxiety levels of women and men ($U=45886.00$, $z=-.556$, $p>.05$) (Table 4).

Table 4. Research Anxiety Levels of Students According to Gender

Variable	Gender	N	Mean Rank	Sum of Ranks	U	p
Research Anxiety	Women	289	303.78	87791.00	45886.00	.578
	Men	326	311.75	101629.00		

Findings regarding the education faculty students' research anxiety differs according to taking a research course

In order to understand whether the research anxiety scores of the participants' change depending on taking a research related course before or not are given in the table 5. Mann-Whitney U test was conducted in the analysis and results revealed there is no statistical difference ($U=45052.50$, $z=-866$, $p>.05$) between the research anxiety of the students whether they have taken a research course or not before (Table 5).

Table 5. Research Anxiety Levels of Students According to Taking a Research Course or Not

Variable	Taking		Mean Rank	Sum of Ranks	U	p
	Research Course	N				
Research Anxiety	Yes	333	313.71	104464.50	45052.50	.386
	No	282	301.26	84955.50		

Findings regarding the education faculty students' research anxiety differs according to departments

In order to understand whether the research anxiety scores of the education faculty students' change depending on the departments they study. In the study the undergraduate programs were grouped as numerical and verbal. Mann-Whitney U test was conducted in the analysis and results revealed there is no statistical difference ($U=40362.00$, $z=-944$, $p>.05$) between the research anxiety of the students whether they are studying in verbal or numerical departments (Table 6).

Table 6. Research Anxiety Levels of Students According to Departments

Variable	Departments	N	Mean Rank	Sum of Ranks	U	p
Research Anxiety	Verbal	208	317.45	66030.00	40362.00	.345
	Numerical	407	303.17	123390.00		

Findings regarding the education faculty students' research anxiety differs according to the grade levels

The research anxiety scores of the education faculty students' change depending on the grade levels are investigated, in the study. The results of the Kruskal Wallis Test show that the research anxiety levels of the students do not differ according to the grade levels ($\chi^2(3) = .407$, $p>.05$).

Discussion and Conclusion

In this study, it was aimed to determine the anxiety levels of undergraduate students studying at the faculty of education towards making scientific research and to reveal whether their anxiety levels differ according to various variables. According to the results of the study, it was seen that the education faculty students' anxiety about doing scientific research was at a moderate level. In the literature there are studies in line with the results revealing that university students from different faculties have low levels of research anxiety (Yılmaz & Cokluk, 2010), moderate level of research anxiety (Kartal & Hızlıoğlu, 2021; Aslan & Karagül, 2016) and also studies the found high level of research anxiety (Tekin, 2007; Saracaloglu, Varol, & Ercan, 2005; Büyüköztürk, 1997). When looked at the responses of students the highest participation of the items revealed that students feel uncomfortable even they heard the word research. Also it is interesting that only the idea of doing research make

them nervous. These answers show how the undergraduate students are negative towards doing research. When looked at the lowest participation of the students to the items, results revealed students do not get anxiety about the problems while making research studies and they do not quickly get tired of doing research.

In the study, it was aimed to examine the research anxiety levels of the students according to their gender, whether they took a scientific research course, the departments and grade levels. According to the findings of this study, it was revealed that education faculty students' research anxiety levels did not change according to gender, whether they took a research course, their studying department or grade levels.

Results revealed that research anxiety of the undergraduates in the education faculties did not change according gender. This result is supported by previous studies that revealed research anxiety is not changed by gender (Bulduk & Hulusi, 2021; Aslan & Karagul; Yılmaz & Cokluk, 2010; Cokluk-Bokeoglu & Yılmaz, 2005; Büyüköztürk, 1999). Results revealed that the fact that students have taken or not taken a course on scientific research methods does not significantly affect their anxiety levels about doing research. In the literature there are studies consistent with this result that anxiety scores do not differ significantly although research methods course (Arslan & Karagul, 2016; Saracaloglu, 2008). Also studies that revealed taking a course on research methods is effective on the level of research anxiety (Bulduk & Hulusi, 2021; Yılmaz and Cokluk, 2010). Thinking about these results, it might be important to focus on the content and quality of existing research-oriented courses. As far as the results revealed taking research-oriented courses did not lead to a difference in undergraduates' research anxiety, it might be useful to examine the lessons by studying separately and in detail. Also the results revealed that education faculty students research anxiety levels do not differ according to the grade levels and the departments they study. Similar to the results, Yılmaz and Cokluk (2010) also found that there is no significant difference between students' research anxiety scores, whether the undergraduate department they studied is numerical or verbal. In various studies conducted at the graduate levels, it was found that the research anxiety levels of students towards scientific research did not differ significantly according to their graduate education levels (Bayar et al. 2013; Aslan & Karagul 2016). Not from the undergraduate levels but in a study investigated anxiety levels of graduate students found that the anxiety levels of graduate students higher than that of PhD students (Saracaloglu, Varol, & Ercan, 2005).


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Overcoming Gender Differences in Education

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Abstract: Gender equity in education is a global priority aiming to promote the right to education for everyone. It is necessary to ensure equal access to girls and boys for completion of their education cycles, as well as empower equity all through the education education process. Lack of equity between boys and girls schools is not a special specific of one country, but a global problem. Annual reports show that a considerable number of children, mainly girls, have interrupted their education in various levels of Albanian education system, due to a number of reasons. Lack of gender equity in the education system is a big obstacle for dynamic development of the society. The education of girls and women in Albania is important, not only as a matter of respecting a basic human right for half of the population, but also as a powerful force for economic development and achieving other social goals such as improved health and civic involvement. This work will focus on gender disparity in Albanian education system, where number of boys and girls is not the same in all education cycles - primary, elementary, secondary, according to data in the largest region in the country. A coordination of the qualitative and quantitative analysis is provided to indicate the reasons for this disparity and compare data according to random chosen schools. This work shall offer suggestions and recommendations to improve school curricula and determine the role of teachers in this aspect in order to create a favourable environment for both genders as well as making the education system more inclusive for all children includes improving standards, curricula and a focus on teacher training and development in Albania.

Keywords: Gender, Education, Equity, Albania, Teacher, Curricula

Introduction

The concept of gender is a concept that expresses the differences in the male and female body as a living being. On the other hand, gender is society's well-established views of men and women, unlike biological definitions and the source of these views is culture. Individuals, both men and women, perform roles, behaviours and actions that are built or given by society. (Basow, 1992, 10-15) From this point of view, gender equality means that individuals benefit from equal opportunities and rights and are treated equally in all areas of life, regardless of their biological gender, develop their personal knowledge and skills in all areas they wish, and freely express their preferences (Bayrakçeken Tüzel, Soyseçkin Ceylan, Chileler Tapan and Özvardar, 2019, 7).

Gender equity is now part of all policies and strategies of all education structures in many countries. Human rights, inclusiveness and equal access to are some of the priorities of a healthy education system. But, somehow, school today is considered an institution that encourages the female teaching styles, leaving male manners in shadow. Expressing feelings and thoughts verbally, doing homework, work in group are some women-like characteristics. Scientific literature suggests that males and females perform differently in teamwork and collaborative learning settings (see Banihashem et al., 2021; Noroozi et al., 2020; 2022). These actions do not take into consideration the strength and male interest and as a result, a considerable number of boys abandon school (INSTAT 2021).

Hence, all citizens are granted the right to attend educational institutions irrespective of their gender, race, colour, ethnic belonging, language, sexual orientation, political affiliation, residence, health situation, limited abilities or any other reason defined in the Albanian legislation. (Constitution of the Republic of Albania, 1998, 25) The Republic of Albania recognizes the importance of gender equality. This is reflected in the dynamic policy initiatives and clear strategic commitment to promote gender equality and empower women in all domains reflected by Gender Equality Index. (INSTAT 2020) UNCRPD strongly underlines the right to education. However, as results indicate, full gender equality is still to be achieved.

Theoretical Framework

Large gender gaps exist in access, learning achievement and continuation in education in many settings, most often at the expense of girls, although in some regions boys are at a disadvantage. Despite progress, more girls than boys still remain out of school. In the recent years, policies, strategies and action plans have focused on providing equal opportunities to boys and girls in the family and society. (INSTAT 2006) The Education 2030 agenda of Albania recognizes that UNESCO's work on education and gender equality is guided by the UNESCO Strategy for gender equality in and through education (2019-2025) and the Gender Equality Action Plan (2014-2021, 2019 revision). It focuses on system-wide transformation to benefit all learners equally, and supports targeted action for girls' and women's empowerment across three areas of priority: better data, better policies and better practices. Even though, number of girls attending schools in developing countries is increasing more rapidly than boys, according to the UNESCO report, out of about 104 million children that miss elementary school, about 57 per cent are girls.

Women consist of 51% of Albanian population. Data on poverty in Albania testify to the feminization of poverty and increasing numbers of children afflicted by it. Albania ranked 20th among 153 countries on the Global Gender Gap Index in 2020, was placed 51st of 162 countries on the Gender Inequality Index in 2019.

Another problem related to gender differences in education which was reflected in the collected data is related to professional profiles. This aspect is important because it affects gender equity in labour market, and according

to the data, there is a higher trend of boys attending vocational schools and higher trend of girls attending high school. For e.g., a vocational school in Tirana counts 26 girls out of 624 boys. (UNICEF 2021).

Likewise, there are problems with Roma community, where female Roma do not attend school, compared to boys, taking into consideration the fact that in some communes in Albania, Roma population consists of majority of local inhabitants, where lack of education among Roma girls is an important problem for the region. (UNICEF, 2021) Another problem is reduction of number of boys attending high school education in rural areas, taking into consideration that majority of population in Albania is rural. (UNICEF 2020) While enrolment of boys and girls is virtually identical in EU-28, in Albania boys have higher enrolment. Gender Equality Index in Albania scores 60.4 indicating that still high commitment is needed to achieve full gender equality. The score is lower than EU. (2017) But, all these can be improved with the right intervention in curricula and school environment, in order to overcome this misbalance in number of boys attending primary and secondary education.

Method

This work offers a quantitative analysis with data collected from schools of primary, elementary and secondary education in Tirana region. Additional data were provided from Institute of Statistics (INSTAT) (2008) and Educational Directorate in this region. These official statistics include comprehensive information on registration of students in various study cycles and their graduation. This work is focused on a collection of data on attainment of boys and girls in schools located in Tirana and an analysis of collected data pointing out to potential reasons that may have caused the gender disparity.

This analysis shall focus on number of boys and girls attending the selected schools in this region during 2020/21 period. This city consists of the majority of Albanian population with a big number of schools concentrated in this area and will help carry out a comprehensive analysis. This work also offers a qualitative analysis with the help of a questionnaire addressed to school's directors regarding reasons that force students to leave studies. After review and interpretation results, this work shall offer suggestions and recommendations for improvement of school curricula in order to make the school environment favorable for both genders and consolidate teacher's role in this respect. It will provide also suggestions and recommendations about teachers' role in order to train them for dealing with situations of gender disparity in the class and highlighting the key points of teachers training in this context, as well as fighting prejudices about gender stereotypes in curricula and textbooks.

Results

Although there were no reported indicators of gender inequality in school enrolment and attendance rates, data show that women of reproductive age have lower educational levels. Data also show that women's educational

levels, especially at or above secondary education, have a positive impact on the improvement of their economic status and reproductive health. (OECD, 2020).

The following table shows the actual situation in schools of Albanian capital, where at primary schools number of boys is higher than girls, then in elementary school the difference is smaller and girls gain some numbers. But in secondary education level we have the reverse situation.

Table 1. Number of Boys and Girls in Pre-university Education Cycles in Schools of Tirana

Education cycle	Total	Girls	Boys
Primary	158.528	75.821	82.707
Elementary	127.958	60.398	67.560
Secondary	88.965	47.623	41.342
Total	375.451	183.842	191.609

Enrolment of boys and girl is virtually identical in the EU28, in Albania, gender gap favors slightly boys in lower education, but reverses in tertiary education, where females graduate outnumber. Other statistics are offered by Albanian Institute of Statistics show also data from higher education, indicated in the following picture:

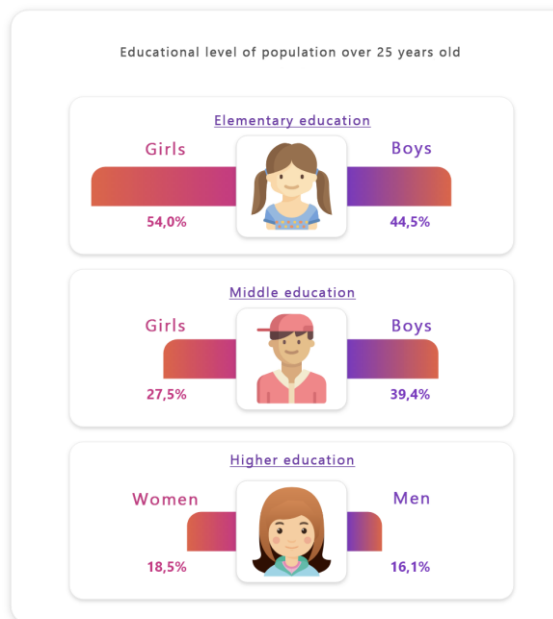


Figure 1. Source from Institute of Statistics

In the framework of this study, a questionnaire carried out in schools of Tirana with the participation of the directors and the responsible person for school statistics listed the main reasons that force school drop out in Albania, which are showed in the following figure:

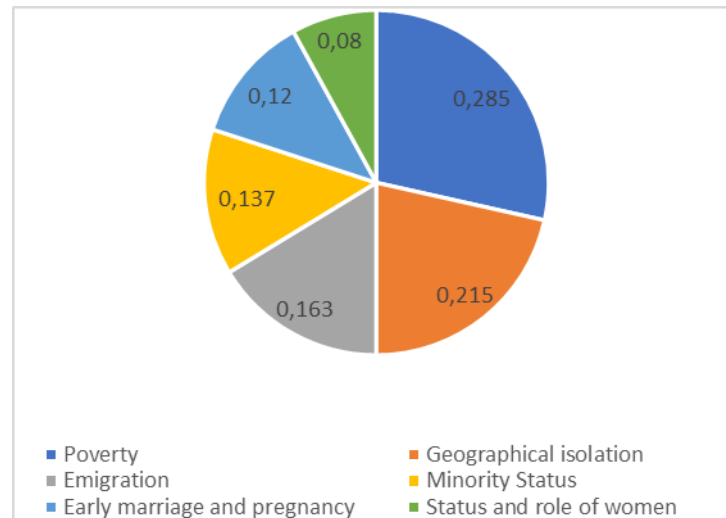


Figure 2. Percentage of Reasons of Failure to attend School

In Tirana outskirts, the economic situation does not favor school attendance. Due to poverty, parents force girls to stay at home to do the housework's and take care of their little brothers and sisters.

Equity is also a concern, with continued disparities in educational opportunities and outcomes according to gender, ethnic background and geographical residence. Geographical isolation is caused by poor road and transport infrastructure places further restrictions on student access to school. While, pursuit of qualitative education is a key factor driving Albania's migration. Demographic changes and migration are driving changes in the geographic distribution of students within the country and presenting a dilemma in terms of education planning, particularly around recourse allocation, as schools are emptying in some municipalities and filling up in others.

Albanian legislation considers Roma as a non-ethnic language minority; an element quoted as an obstacle for engagement of Roma people in comprehensive education by many authors and lack of Albanian language possession has been seen as a reason for abandoning of school by these students. Most of street children and working children belong to Roma community, who are disadvantaged compared to students coming from other environments. They reach an average of about 4.02 up to 5.05 school years. Among group children who risk abandoning school are girls due to early marriages especially among Roma girls. Mentality of parent's obstacles girls in rural areas to attend school, stopping them to attend classes after compulsory education. Indicators showing school abandoning tell that parents offer excuses not to allow girls attend school, because they ask for warranties and protection from school, security during road to school, protection from abuse.

Discussion

Gender equity can never be achieved through administrative decisions or legal acts, it can be established only through an efficient education system. In this respect, all the stakeholders: government structures, local government units, human rights and civil society organizations shall play a crucial role. Decentralization processes of education systems in Western Balkans mean an increasing autonomy of schools, which can lead to increasing rights for professional decision-making by teachers themselves.

Socio-economic conditions have a significant impact on access to education and educational outcome and students from disadvantages backgrounds perform less well than more advantage students. (Wayne, 2013, 36-38) This finding indicates a lack of opportunities in less well-off households and in poorly developed, rural or remote communities where access to education for both girls and boys is significantly lower than elsewhere. In this respect, the education laws should reflect national priorities in this field, drafting among others things a Social All-Inclusive Strategy. Therefore, we should pay special attention to curricula and teaching models. We should look for teaching absorption ways suitable also for males' role.

Data from OECD Programme for International Student Assessment (PISA) show that about 79 % of the responsibility for curriculum implementation lies at school level, therefore local unit have to act in this respect. During the questionnaire, findings showed that boys had a different behavior regarding learning environment, which is regulated by teachers at school, but in some cases new teachers are more insecure and incapable to create a favorable environment for boys. Some boys claim that teachers are not fair because they always stand on girls' side. In contrary to boys, relation of girls with education includes several aspects, such as improvement of social status, key weapon to poverty, emancipation and integration of women in all fields.

In general, teachers are not well-prepared to work with children of different social-cultural origins. Likewise, studies show that teachers' current education is characterized by theoretical knowledge, whereas practice is almost absent, zeroing opportunities to establish teachers' capacities to deal with external factors regarding all-inclusive education. This is one of the biggest challenges for teachers' trainings about all-sided education practices. Initial qualification system of teachers in Albania is mostly based on subjects and program structure, which makes almost impossible the specific teaching of competences and professional expressions for students' inclusiveness and recognition of diversity.

Continuous qualification of teachers has provided a minimal contribution in learning of inclusiveness competences, due to the fact that qualification programs during working years are not comprehensive or accredited. The policy planning and teachers training practices should be focused on all-inclusive education in contexts of social and cultural diversity. The changes in policies and practices are better if they could be made in harmony with teachers' experience, in harmony with other developed countries. (Florian & Rouse, 2009)

Recommendations

We propose a number of measures to be taken by decision-taking authorities, teachers' trainers and teachers themselves to accelerate the reform for an inclusive policy, based on data provided during the study.

- fight prejudices about gender stereotypes in curricula and textbooks.
- encouraging sensitization importance of education among girls, combating prejudice of this issue affecting Albanian educational systems, ways how to overcome barriers in the access for girls to and in educational systems of Albania, measures for trainers and teachers themselves at a system level for a social inclusion through education.
- creating a school environment that is friendly to both sexes and ensuring that women are equally represented in teaching, administrative and educational leadership roles.
- carrying out the right interventions in curricula and school environment, in order to overcome this imbalance in number of boys attending primary and secondary education.
- paying special attention to curricula and teaching models. We should look for teaching absorption ways suitable also for males' role.
- increase teachers' competences necessary for an all-sided education in social and cultural diversity situations.
- hold organized training activities for teachers

According to all recent studies, all-inclusive education in Albania requires a different model to influence in all system's levels.

- More powerful effort is needed to recruit men in the role of lecturer in our schools
- More attention to needs of boys
- Lectures should not only be focused on theory, but also they should include action
- Schools environment should become friendlier for boys.

Meanwhile, authorities should contribute in promotion of policies and practices for an all-sided education in context of social and cultural diversity.

Conclusion

Development of inclusive education practices requires efforts and joint initiatives with the participation of all groups of interest. Government plays an important role in coordination of trainings and other services offered by governmental and non-governmental institutions, international agencies, teachers training institutions, schools and communities. This would help fill all pieces of the puzzle to contribute for the same objective. A leading role can be carried out by the governmental institute or a commission subordinated by Ministry Education may be created to ensure coordination and supervision of its implementation for a long-term period.

Albania has undertaken significant education reforms over the last two decades that have improved access to education and raised learning outcomes, including decentralisation of school governance and introduction of a competency-based curriculum. Access to compulsory education has expanded and student performance has improved, but learning levels remain among the lowest in Europe. A large scale of Albanian students still leave school without mastering basic competences. This limits the employments and life chances of many individuals and risks holding back national development. Closing the skills gaps by improving educational outcomes is seen as crucial to attracting foreign direct investments as Albania moves toward EU accession.

This topic is relevant for European policymaking regarding future projects focused on prevention of school abandoning by girls. This topic is sensitive in some Western Balkan countries, but as long as aspiration of these countries is joining EU, they must be ready to join. Inclusiveness education in a broader point of view is understood as a process through which schools try to treat students as individuals of their own from local communities, who will to attend studies and should reduce all forms of exclusion. Ensuring the integrity of girls and women, promoting their socio-economic rights, supporting disadvantaged groups and engaging men and boys in all activities aimed at empowering women and providing equal opportunities are some of the key objectives of Albanian authorities.

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Students' Motivation, Satisfaction, and Perceived Learning Using Online Peer Feedback in the Context of Argumentative Essay Writing

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Abstract: According to the literature, students' motivation and satisfaction can influence their perceived learning outcomes. However, little is known about what kind of a role do motivation and satisfaction play in the context of online peer feedback. This exploratory study aims to examine the relationship between students' motivation and satisfaction with their perceived learning outcomes in an online peer feedback environment. To do this, 49 graduate students from a Dutch university participated and they were involved in an online peer feedback module for argumentative essay writing. At the end of the module, students were asked to fill out surveys regarding their motivation, satisfaction, and perceived learning outcomes. The results showed that there is a positive correlation between students' motivation and satisfaction with their perceived learning outcomes in an online peer feedback environment in the context of argumentative essay writing. These results provide insight into how students' motivation and satisfaction can impact their perceived learning outcomes during an online peer feedback activity in the context of argumentative essay writing.

Keywords: Argumentative Essay Writing, Motivation, Online Peer Feedback, Perceived Learning Outcome, Satisfaction

Introduction

Peer feedback has been utilized to help students improve their argumentative essay writing. Prior research confirms its effectiveness in improving students' argumentation skills in essay writing (e.g., Latifi & Noroozi, 2021; Latifi et al., 2021) and learning, engagement, and motivation (e.g., Gielen et al., 2010; Pratama & Arriyani, 2021; Zhang et al., 2014). Student satisfaction is essential in understanding the effectiveness of online learning (Arbaugh & Benbunan-Fich, 2007; So & Brush, 2008). Teachers are unable to offer effective one-on-

one feedback on students' argumentative essay assignments because of a tremendous workload (Akhteh et al., 2022; Latifi & Noroozi, 2021; Latifi et al., 2021b; Noroozi & Hatami, 2019) so peer feedback has been recognized as an efficient teaching approach to assist students in enhancing their argumentative essay compositions in such situation. Argumentation is seen as an important skill for students (Prata et al., 2019). Peer feedback has been suggested to enhance students' argumentative essay writing, and previous research has shown that it is significant in improving students' argumentation skills and knowledge in essay writing (e.g., Latifi & Noroozi, 2021; Latifi et al., 2021). Although online peer feedback was an effective instructional technique for improving students' argumentative essay writing quality, only a few research investigated students' motivation, satisfaction, and perceived learning with such online learning activity in the context of argumentative essay writing. As a result, the purpose of this research was to investigate students' motivation, satisfaction, and perceived learning using online peer feedback activity in the context of argumentative essay writing. To address research, the following research questions are formulated and answered in this study.

- RQ1. To what extent does students' motivation predict their perceived learning outcomes in an online peer feedback environment?
- RQ2. To what extent does students' satisfaction predict their perceived learning outcomes in an online peer feedback environment?

Method

In this research, 49 graduate students participated from Wageningen University and Research (WUR) in online course from the social sciences domain. A questionnaire with 38 items developed by Mahdizadeh (2008) and adjusted by Noroozi et al. (2107) was used to measure students' motivation, satisfaction, and perceived learning with online peer feedback activity. Multiple Linear Regression and Pearson correlation coefficient were used to analyze data.

Results

Results showed a positive correlation between students' motivation and satisfaction with their perceived learning outcomes in an online peer feedback environment in the context of argumentative essay writing ($r=0.690$, $p<0.001$; $r =0.762$, $p>0.001$). Students with a high level of motivation showed a high level of perceived learning outcomes so students' motivation is a strong predictor of their perceived learning outcomes in argumentative essay writing. Students with a high level of satisfaction showed a high level of perceived learning outcomes. So students' satisfaction is a strong predictor of their perceived learning outcomes in argumentative essay writing.

Conclusion

According to the findings of this study, students are very satisfied and motivated by online peer feedback and

this satisfaction impacts their learning outcomes positively. Furthermore, it was discovered that students consider learning to be enjoyable while participating in online peer feedback activities. This shows that students find online peer feedback useful, that they are satisfied with their learning through online peer feedback activity, and they are motivated to keep using peer feedback in the context of argumentative essay writing. The findings indicate that online peer feedback can be a powerful instructional technique in the context of argumentative essay writing and the results of this study are in line with previous studies. (Latifi et al., 2019, Noroozi et al., 2016; Noroozi & Mulder, 2017).

Recommendations

In this study, we explored the role of motivation and satisfaction of students using online peer feedback on perceived learning in the context of argumentative essay writing. Consideration of the role of teachers as a mediator variable can help in understanding important aspects of perceived learning outcomes. Additionally, to explore the impacts of online peer feedback on perceived learning we exclusively employed quantitative data analysis and measures. However, we admit that qualitative analysis would add value to the study's conclusions.

Notes

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Design and Implement a Hybrid Air Conditioning System Using a Solar Energy

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Abstract: Living on the new world is defined by many criteria and the temperature inside the buildings and vehicles is one of these criteria's, for that reason the use of Air-Conditioners is widely spread around the world which is one of the main reasons of increasing the energy demand on the entire world, which requires to use a clean energy such as solar energy to save the environment from the high effects of normal ways of producing the energy. Using fully renewable energy sources to operate the building appliances is very costly, especially for Air-Conditioners for that reason most of the projects and research done is using a hybrid system by both grid sources and renewable energy sources. For making the hybrid systems there must be a good study for the area of installing the system and the type of renewable source which will be used then after installing the systems such as solar panels it should be connected to an inventor to invert the DC power to an AC power which will be used for the normal appliances. The system should operate on a high efficiency and should designed on an optimum way to reduce the installation cost in consideration of the tariff cost as the same of what this paper explains and illustrate the optimum system condition and design to implement a hybrid solar and grid system to a 1.5 Ton Air-Conditioner.

Keywords: Air-Conditioner, Solar Panel, PV Panel, Grid energy, Hybrid System, Temperature.

Introduction

Maintaining the proper environmental temperature is one of the top needs for living, for that reason the air-conditioning system have been invented and used mostly everywhere, heat and moisture are removed from the inside of an enclosed area using air conditioning systems. To create a more pleasant atmosphere for both humans and other animals, this is a frequent method of doing so. Computer servers, power amplifiers, and other heat-producing electrical devices can all benefit from the usage of an air conditioning system to keep their environments cold and dry. It is also utilized in areas where fragile items like artwork are present, such as museums. Evaporation or free cooling can also be used to cool an air conditioning system, but this is less

common. Desiccants can also be used to build the system (chemicals that eliminate moisture from the air). Subterranean pipes are used to store and dissipate heat in most air conditioning systems.

Even while we may choose to use our air conditioner less, it might be difficult to break the habit of doing so. At a high price, we've become accustomed to having the optimum temperature in our houses and flats. We can save money and the environment by learning how much energy our air conditioner consumes, and by adjusting our behaviours accordingly, we can save money and the environment. The amount of power needed depends on a variety of things. On a hot day, a central air conditioner might require up to 3,000 watts of power. 750 watts per hour is the typical consumption rate while running our air conditioner just on the fan. Small and medium-sized air conditioners use roughly 2,900 and 4,100 watts, respectively, each hour. Depending on the size of the unit, a big window AC may draw up to 1,440 watts, while the medium model can draw up to 900 watts.

Solar systems have relied on the Sun for billions of years. The use of the Sun as a source of energy dates back as far as humanity itself. It is used for food production, heat, fire, and other purposes on a variety of continents. Even though photovoltaic cells have been around for a long time, they haven't been used to their full potential until now, thanks to advancements in technology and time. Our houses and appliances may now be powered for a fraction of the environmental cost of conventional sources by solar electricity generated from the sun's beams. Because of this, solar power has seen rapid expansion in recent years. Solar power began as a niche use but has now evolved into a widespread use of the technology. Solar air conditioners are one example of a use for this renewable energy source. The sun may be used as a source of energy for these heating and cooling appliances. Among the many advantages of this energy source are lower utility costs and a low environmental effect. It is possible to run a hybrid solar-powered air conditioner on both DC and AC simultaneously. It is possible to connect these devices to both the grid and the solar panels/batteries.

An appropriate power source may be selected for each time of day and for each power need. They can seamlessly transition between solar and grid electricity. They may be used at any time of the day or year since they are so adaptable. If your batteries aren't fully charged and if you've put this system off-grid, it won't operate at night. solar panels can be used to provide the power needed to run an air conditioner's compressor. Other aspects of this project include a water condenser cooling system driven by solar energy, which utilizes a cooling tower and fan-coil units within. Buildings in subtropical cities may save the most energy by using absorption and photovoltaic refrigeration systems. A comparison is done between several solar-powered cooling systems. A thermal system vs a PV panel system with batteries, regulators, and inverters is compared. Solid desiccant, adsorption cooling, and absorption cooling are all alternatives in this second technique. Using solar technology necessitates a smaller catchment area, and the price of photovoltaic panels is currently falling below the \$1/Wp level. Photovoltaic panels may provide substantial benefits over traditional air conditioning systems, such as their huge operational dependability, the correlation between hours of sunshine and energy consumption or the potential energy and cost savings that can be realized (Francisco J. Aguilar, Pedro V. Quiles, Simón Aledo, 2014).

Project Aim

To Design and and implement a Hybrid air conditioning system that use both normal grid power and Solar power to reduce the cost of electricity, save environment and increase the efficiency of the AC.

Project Objective

1. Understand the concept of hybrid systems.
2. Learn how to design a good hybrid system that use both grid and solar energy.
3. Learn how to study project feasibility.
4. Design and implement a system with lower cost and high efficiency.
5. Saving the environment by using renewable energy.

Problem Description

People's standard of living is increasing. People's most fundamental physical demands are met by air conditioning systems, which have become necessities in modern life because they create a pleasant atmosphere for active lifestyles and activities. But this air conditioning systems are consuming a huge amount of energy which leads to increase the amount of money that spend on this amount of energy, furthermore it effects the environment and there are many buildings which already install the AC's and it is not feasible for them to change them into another built-in hybrid systems, so the best way to maintain the lower amount of energy consumption and maintain the financial feasibility and saving is to convert the normal AC's into a hybrid AC's which are working in both solar power and on-grid power.

Project Feasibility

The feasibility of this project can be divided into two parts, one is the financial feasibility and the other one is environmental feasibility, for the financial feasibility, we will use a 1.5 Ton AC and this system will required around five solar panel of 450 W for each and these will cost around 70 OMR, and a 2KW inverter that will cost around 350 OMR and the accessories cost round 70 OMR and DC & AC wires of approximately 30 meters which will cost around 72 OMR, and combiner box of 120 OMR, monitoring system of 20 OMR, measurement system of 20 OMR, surge arrester of 20 OMR, and if we consider that we will need an outside source of engineering study which will cost us around 35 OMR, and if we considered an outside source on installation which will cost around 385 OMR, for such a project it we will save more than 50% of the consumption power because if we install it on the National University most of the using time will be on day-time and it will also reduce the annual utility for the AC. On the other hand, the environmental feasibility is very high, because when you are reducing the amount of grid energy that used on the system and use a clean energy, we will be doing a lot for the environment, because of reducing the greenhouse gases and reduce the emissions and pollutions that are produced when generating the grid energy (see Table 1.).

Table 1. Cost of the System (self, 2021)

Cost of the system			
Installation costs			
Item	Quantity units	Cost USD	Total USD
PV modules			
LR4-72 HPH 450 M G2	5	200.00	1'000.00
Supports for modules	5	40.00	200.00
Inverters			
SUN2000L-2KTL	1	900.00	900.00
Other components			
Accessories, fasteners	20	1.00	20.00
Wiring	30	7.00	210.00
Combiner box	1	300.00	300.00
Monitoring system, display screen	1	50.00	50.00
Measurement system, pyranometer	1	50.00	50.00
Surge arrester	1	50.00	50.00
Studies and analysis			
Engineering	1	100.00	100.00
Installation			
Global installation cost per module	5	40.00	200.00
Global installation cost per inverter	1	50.00	50.00
Transport	1	500.00	500.00
Settings	1	50.00	50.00
Grid connection	1	50.00	50.00
Total			3'730.00
Depreciable asset			2'120.00
Operating costs			
Item			Total USD/year
Total (OPEX)			0.00
System summary			
Total installation cost	3'730.00 USD		
Operating costs	0.00 USD/year		
Produced Energy	4571 kWh/year		
Cost of produced energy (LCOE)	0.033 USD/kWh		

Project Scope

The main scope of this project is to convert the normal AC into a hybrid AC that is using solar energy. This will be done by installing the panels on an open area, connecting the inverter DC input and the AC input, connecting the inverter output, and testing for the inputs and outputs energy with troubleshooting if there is any interference on the energy, and testing the system after finalizing all steps, so in general the scope will be engineering, installation, and testing.

Project Methodology

This project will be done by installing the panels on an open area that is reached by the solar radiation to make sure it will work with high efficiency and generate a good amount of energy, then we will be connecting the

inverter DC input to the solar panels and the AC input to the grid cables to make sure that inverter will be controlling the smooth switching between solar panels energy and grid energy, then connecting the inverter output to the AC system, after making these connections it will be required a testing for the inputs and outputs energy to make sure it maintain the required energy.

Project Challenges

There are many challenges on this project as every project have on the earlier stages that required from us to resolve and try to reduce their effect to make sure that our system will work properly, one of the expected challenges is the probability of system failure due to different power sources interruption which is a critical challenging that we need to be very careful while designing and implementing the system, also we have a challenge that finding the proper inverter which can control the power because we have to check its availability in Oman, and if not, we should order it from outside suppliers, furthermore the AC may not start because it required a high power on the primary jump start so for this we need to consider the fast switching between sources when there is a need for power, adding to that, Implementing the PV panels on different type of areas and directions will be a big challenge for us because every area will have a different sunlight intensity so the production will be different and need to be calculated to make sure the panels fixed will be enough and reliable for the system.

Project Motivation

The motivation of this project is coming because of global warming issues increased and after the electricity cost rising in Oman, that problem cost people a lot of money and make them disappointed and depressed, because they cannot reduce their usage of electricity very much and on the other side the bills are very high, so there should be a solution that help people for saving more money. I make small research on what is the most appliances that increase the energy consumption and I found that cooling systems and heating systems are the most appliances, and the most appliances are installed in Oman are the air conditioners, and the solution is to have a hybrid systems, but most of the buildings are already installing the air conditioners and it is not feasible for them to replace the old AC's by the new hybrid AC's, so the best case scenario is to design and convert the old AC's into a hybrid AC's that use solar energy and grid energy, and furthermore the rules and regulation in Oman are requiring a certain approvals to install an on-grid solar system for the full building, but in case of install it for the only AC it will not require any approval, for that reason the best solution will be this system.

Project Outline

There will be four sections to this project. The project's advantages, obstacles, and solution to the problem are summarized in the first chapter's introduction. The second chapter of the report is a literature review, which is critical since for numerous researches will be conducted to compare and contrast them in order to improve the

project. Third, the pre-design and analysis chapter illustrates the project's block diagram and flowchart, as well as the project components and costs. Conclusions and future work will then be offered to illustrate how to further improve this project by adding new features and advancements to it.

UNSDG Goals and Targets

This project met the UNSDG goals number 3, 7, 11, 12, 13, and 15 respectively of Ensuring healthy lives and promote wellbeing for all at all ages, Ensuring access to affordable, reliable, sustainable and modern energy for all, Making cities and human settlements inclusive, safe, resilient and sustainable, Ensuring sustainable consumption and production patterns, Taking urgent action to combat climate change and its impacts, and Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification and halt and reverse land degradation, and halt biodiversity loss. These goals are a very important goal which we should achieve to maintain the global sustainable development.

Method

Pre-Design

As part of the project's pre-design and data analysis, this part describes the working principles behind each stage and how they interact with one another. Aside from examining information for components and describing their properties, data analysis is also included. In order to acquire the greatest results for real-time monitoring, components and integration must be able to work together harmoniously in order to produce the best outcomes.

Hardware Components

Solar PV panels

In this project, light energy from the Sun (photons) is used by photovoltaic modules to generate electricity. Crystalline silicon cells or thin-film cells are used in the majority of modules. The top or rear layer of a module's structural (load-bearing) element can be used. Protection from both mechanical and moisture damage is essential. Semi-flexible modules based on thin-film cells are also available, however the majority of modules are rigid.

For a given target voltage, the cells are often linked one to another in series, and then in parallel to enhance the current flowing through them. When the voltage and current of the module are multiplied, the resulting wattage (in volt-amperes) is the power of the module. Standard conditions are used in the manufacturing process of solar panels, however these conditions do not represent the actual operating conditions that solar panels are exposed to after they are installed. We will be using five panels on this system to generate the clean energy that is integrated with the grid energy to be used for the air-condition.

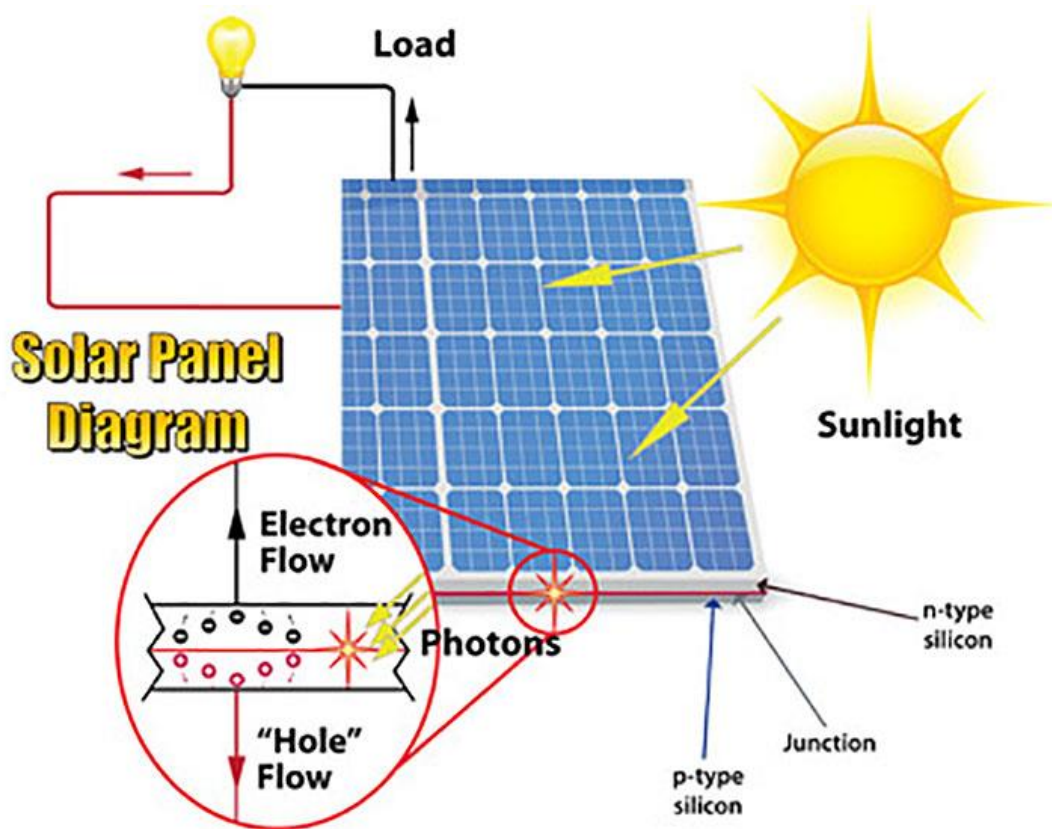


Figure 1. Solar Panel Diagram

Inverter

One of the most critical components of our system and solar energy systems is an inverter. Device that transforms direct current (DC) power generated by a solar panel into the AC electricity used by the electrical grid. In a DC system, the voltage is always maintained in one direction. As the voltage shifts from positive to negative, electricity flows in both directions throughout the circuit. There are several types of power electronics equipment, including inverters, that control the flow of electrical power. To convert DC to AC, an inverter switches the direction of a DC input back and forth at a very high rate.

Consequently, the DC input is transformed into an AC output. It is also possible to make a sine wave voltage that can be sent into the power grid using filters and other electrical components. Over time, voltage forms a symmetrical pattern known as a sine wave, which can be used without harming electrical equipment that is designed to operate at specific frequencies and voltages, like transformers. For our system we will be using a hybrid type inverter and the solar panels input and the grid input will be connecting to it, then the inverter will be inverting the DC input to AC and control it with the grid input to produce a single AC output that is stable and controlled to go to the AC.

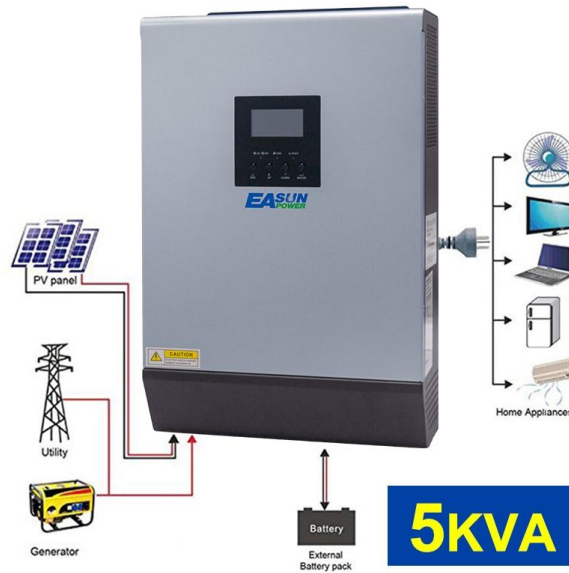


Figure 2. Hybrid Solar and Grid Inverter Diagram

DC & AC cables

The architecture of DC cables differs significantly from that of AC cables, as does the method through which DC cables evacuate electricity. Using AC wire for DC power evacuation is a no-no. Because of copper's superior flexibility, current carrying capacity, and thermal performance, DC cables may be found in solar power plants, where they are commonly employed. Skin effect isn't as noticeable in DC cables as it is in AC cables, therefore the difference in copper per unit length will have an impact on the cable's capacity to dissipate power. In our domestic appliances, we utilize AC power to transmit power because we can adjust the voltage to our specific needs, which results in a lower transmission current. This makes AC power ideal for power transmission. A single insulated cable is used for AC power whereas a double-insulated cable is used for DC power. The DC cable's copper wire is tinned to prevent corrosion and other environmental threats from the wire. This means that DC cables have strands that are thinner than those used for AC. In Our project we will be using both DC & AC cables, the DC used from the solar panels to the inverter and the AC from the grid to the inverter and from inverter to the AC.

Figure 3. DC Cable

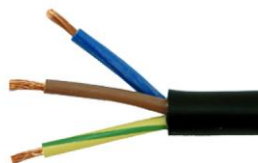


Figure 4. AC Cable



Software used

PVsyst software

An whole PV system may be studied, sized, and data analysed with PVSyst, a PC software suite. PV systems that are linked to the grid, stand-alone systems, pumping systems, and DC-grid (public transportation) systems are all included in this comprehensive database. Architects, engineers, and researchers will find this program useful. It's also a great tool for teaching and learning.

Proposed system Block Diagram

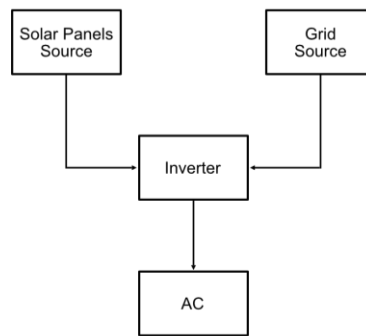


Figure 5. System Block Diagram

The above block diagram shows that the solar panels will generate DC power during the day-time and it will be connected to the hybrid inverter and also the grid power source which is coming from the distribution company will be connected also to the hybrid inverter and the inverter will be inverting the DC power into AC power and will control the source inverted from the solar and the grid source to be stable and maintain the proper quality of power which will go directly to the AC, the AC will be working in full efficiency by solar power and if it drops it will be switched to the grid power source which will help to reduce the cost of the bill and save the environment by using the renewable energy source.

Results

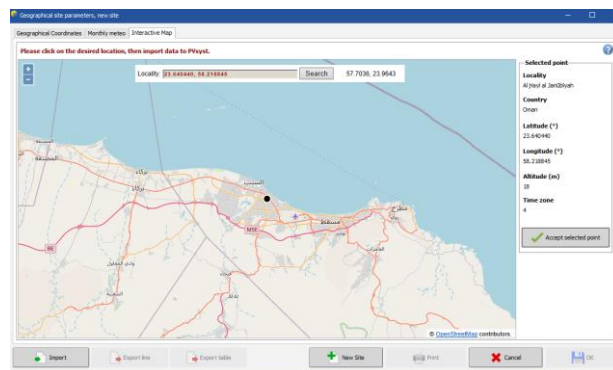


Figure 6. Geographical Site (Self, 2021)

There is a good result appear after making the simulation for the project by using PV syst software.

On the simulation we use PVsyst software to maintain a good simulation that can help my project to be more accurate, the geographical site is a very important step to be considered to know the sun irradiation on the proposed location, I select the location of the National University (Caledonian college of Engineering at National Univerisy) to install the system.

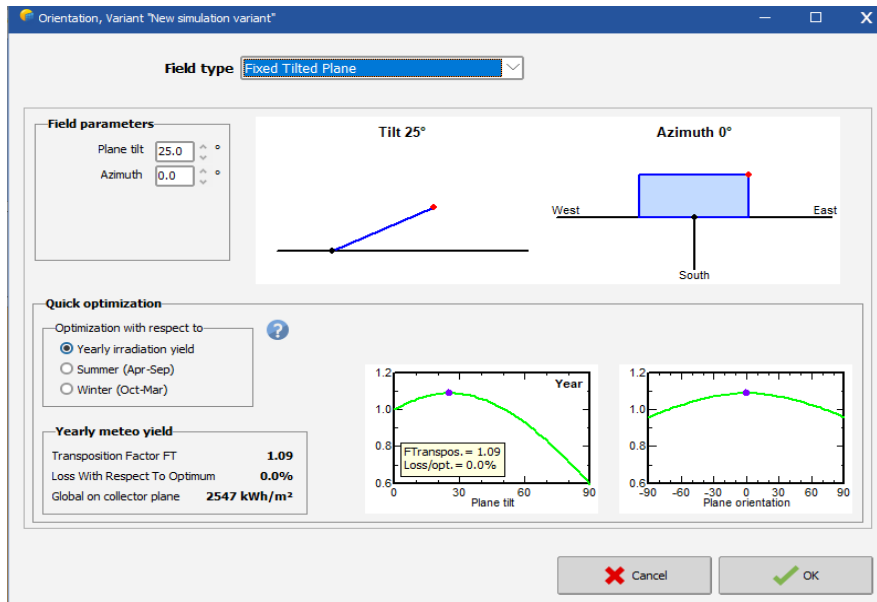


Figure 7. Panels Orientation (Self, 2021)

After the selection of the geographical site, the panels orientation will be decided to be installed on which direction and tilting degree to produce the maximum power from the solar irradiation and use the maximum efficiency of the panels.

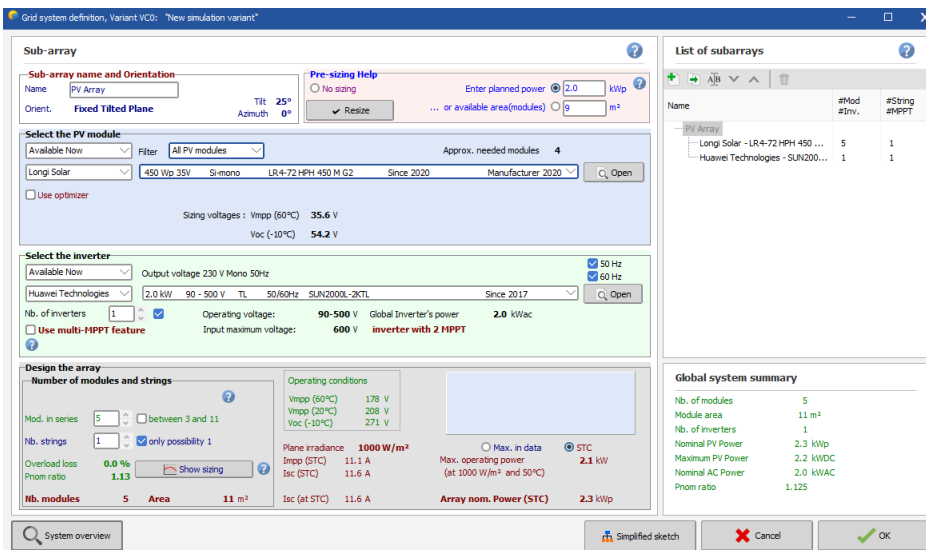


Figure 8. System Sizing (Self, 2021)

The system sizing is very important to be decided to know how many panels and type of panels we will use on the system and the inverter size and type to be used and also the number of strings will be used on the system.

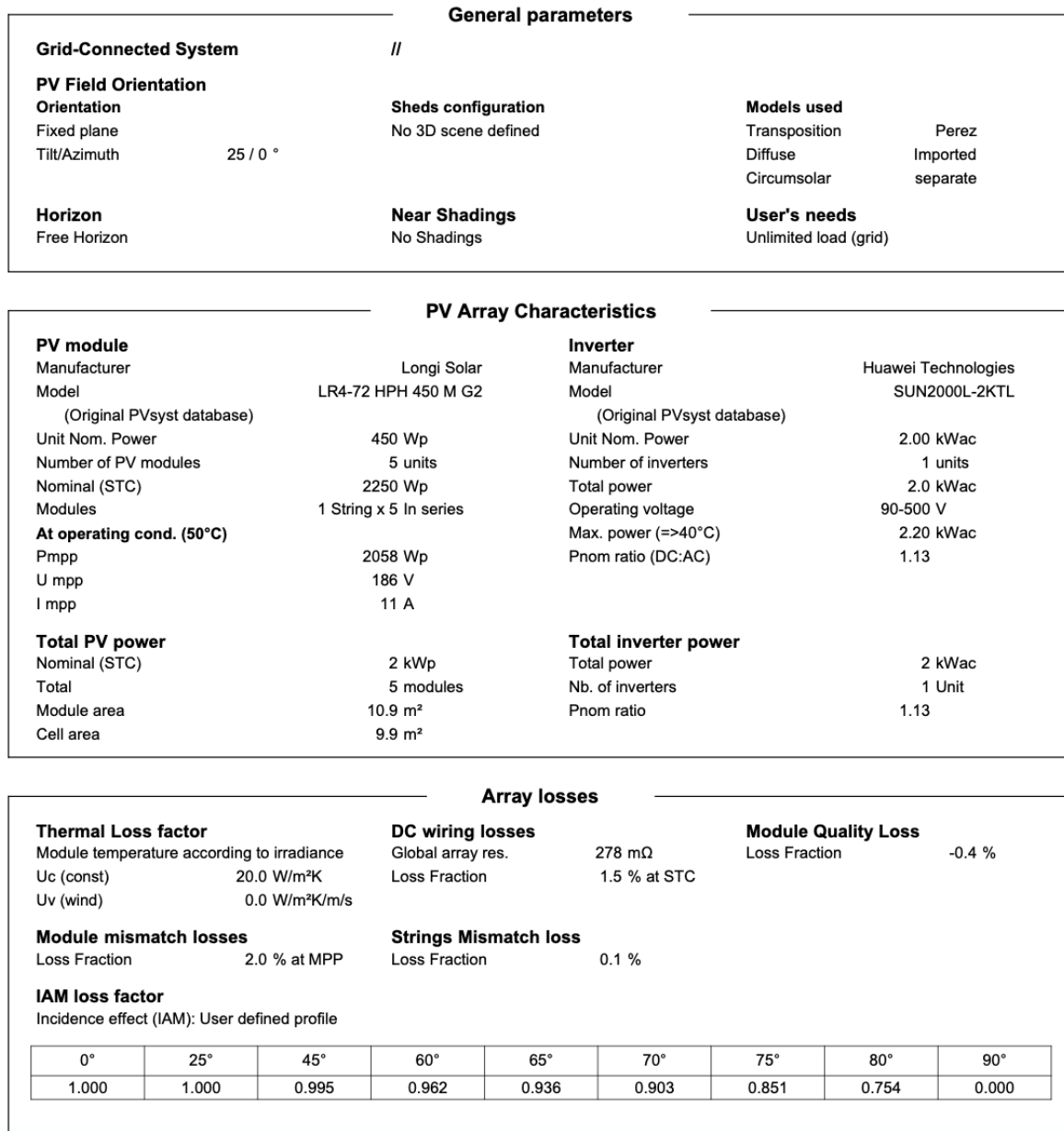


Figure 9. General Parameters, PV Array Characteristics, Array Losses (Self, 2021)

The general parameter for our simulation shows the PV orientation on vertical and horizontal and if there is any near shading like mountains and some big building and skyscrapers which will affect the system generation and efficiency as more of the type of panels that will be used on the system. For the PV array characteristics, it shows the PV module, power generation, number of modules, and the outputs expected under the operation temperature and the total PV power also it shows the model and manufacture of the inverter selected, and the required power and units for the system. For array losses it calculates the total losses that the system will be

expected to lose from module temperature according to irradiations, DC wiring losses, Module quality losses, module mismatch losses, string mismatch losses, and IAM losses factor.

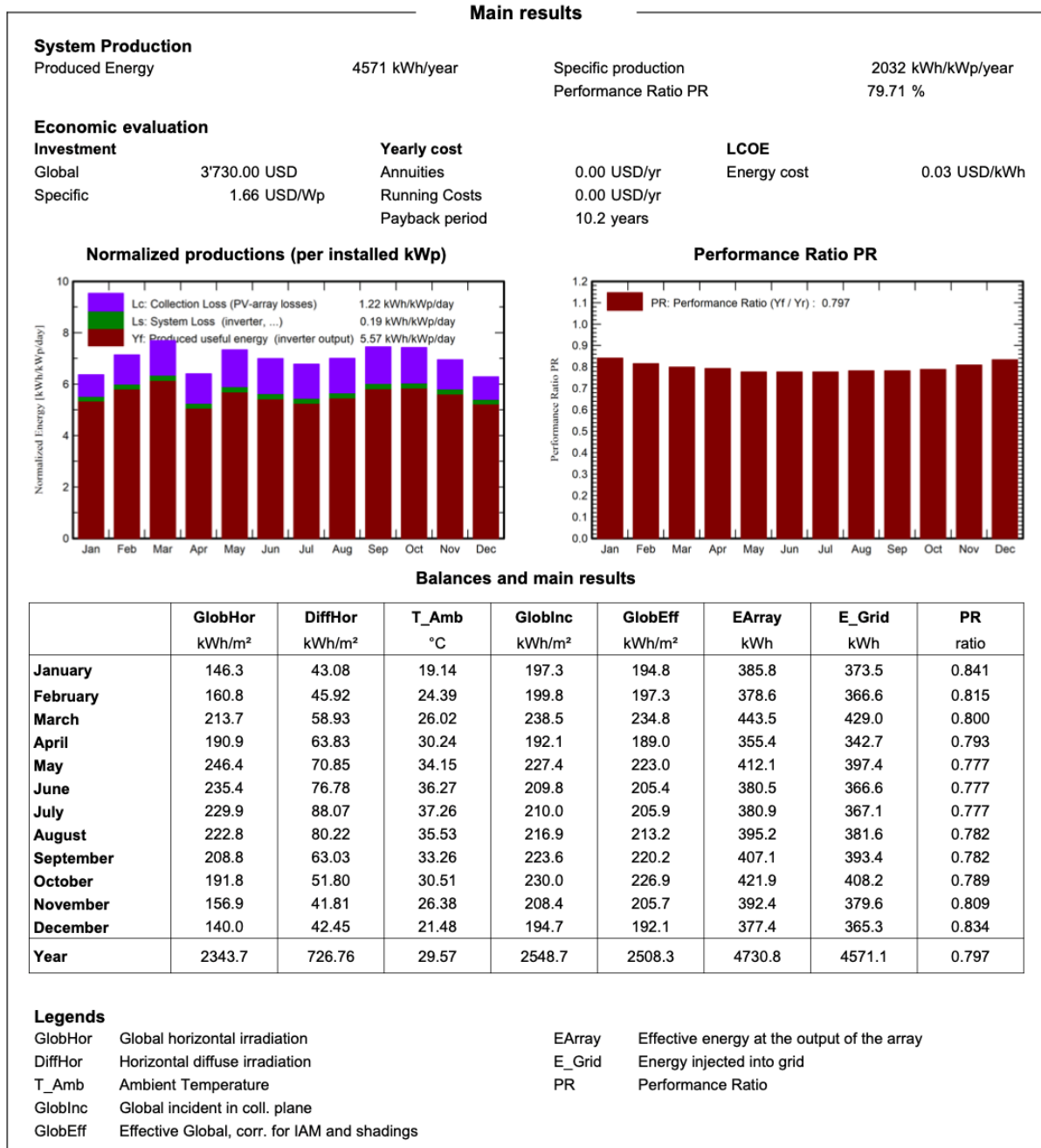


Figure 10. System Main Results (Self, 2021)

This analysis shows the specific production which we shows for our system which is approximately 2KW, and its performance ratio which reach around 79.71%, furthermore it shows the economical payback period for our system based on a tariff of 30 Baisa/kwh which is around 0.075 USD/kwh, and the analysis also shows the balance and main results of each month during the year.

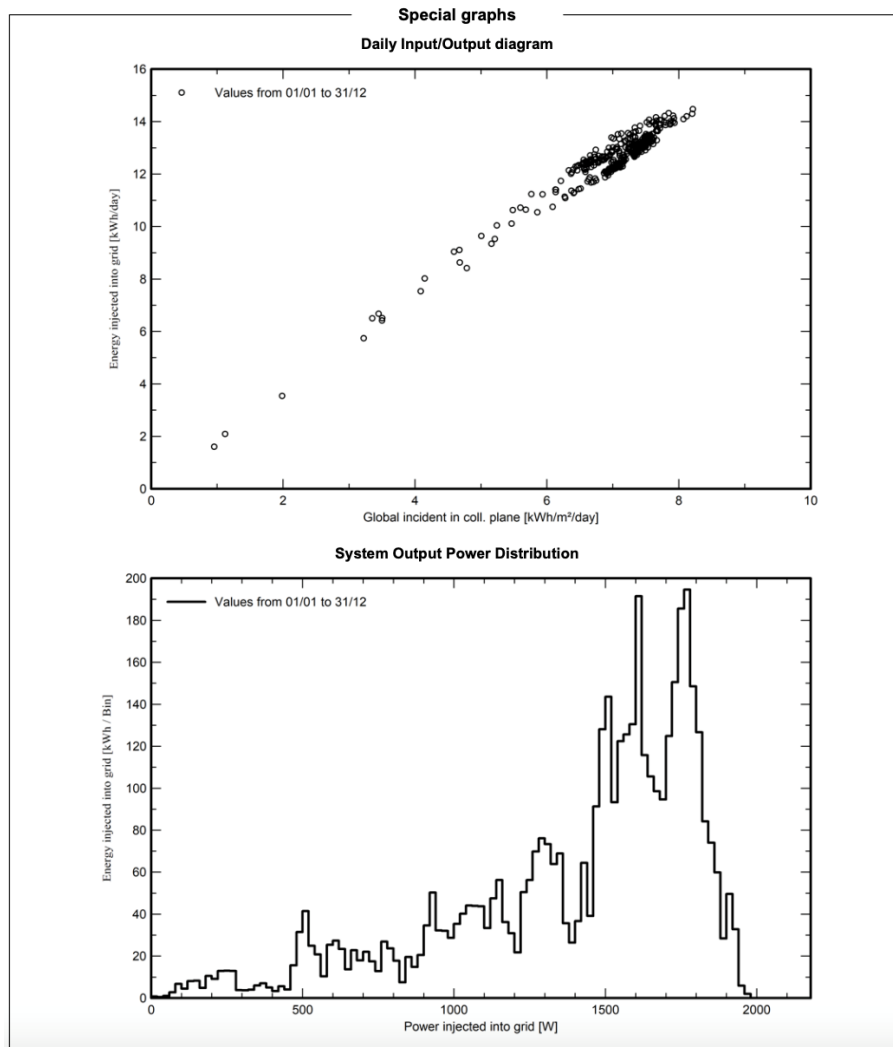


Figure 11. Daily Input/Output Diagram & System Output Power Distribution (Self, 2021)

For daily input/output diagram it shows the global incident in collecting plane in consideration the energy injected to the grid. For the system output power distribution diagram, it shows the power injected into the grid in consideration of energy injected into grid. The simulation results are shown on the figures from Figure 6. to Figure 11. and it shows the amount of power can be generated as our design of 2KW and the optimum solar panels to be fit for our system which are 5 panels and a 2KW inverter, also shows the peak time of solar radiation and based on the tariff we use, the payback period will be 10.2 years if we outsource installation and engineering scope but it will be less for our project because we will make it inhouse by us.

If we calculate how many on-grid Air Conditioning units in each area we will find a very big number and they have the major electricity consumption from the total area consumption, and if we can make them a hybrid unit it will be very benefitable for the individuals, companies, and environment. This project can help on making the comparison and test the real difference and lead to the usage change.

Conclusion

All to all, this paper is clarify and illustrate the way of Designing and implementing a Hybrid air conditioning system using a solar energy, on the first chapter it talk about the background of the project and the aim and objectives, and also it describe the problem that the project solve, and it explains clearly the financial and environmental feasibility as more as the scope of work for this project and the methodology that will be used step by step to make the project, and it describes the challenges that the project expected to face and the motivation behind this project and the full project outline and how it is linked to UNSDG goals and targets.

For the literature review chapter, it discusses around nine journals talk about related topics to have different opinions and studies to make sure we can design a good system. On the Pre-design system it explains the main hardware components from solar PV panels and the inverter and DC and AC cables, furthermore it shows the software which the system required to simulate the system and show for us the expected results of the system, also the block diagram of the system have been showed and explained, and finally the simulation of the system analyze the geographical site, panels orientation, system sizing, general parameters, PV array characteristics, Array losses, system main results, daily input/output diagram, and system output power distribution.

Recommendations

The Future work for this project will be the technical work of installing the system, first we will be selectin one of the AC's on the National University to make the system on it, then we will purchase the solar panels, inverter, DC cables, and mounting structure for the panels, then we will install the mounting structure on the proper direction and tilting, then the solar panels will be fixed on the structure, then installing the inverter, then connecting the cables, and finally the testing will be done for the system to check the readings. For next future, increasing the number of AC units to reduce the installation cost and adding wind power generators to work aligned with the solar panels to increase the clean energy inputs and reduce the amount of grid power used, and after increasing the number of AC units we can add a small batteries unit that can store the power for night time and the cloudy days.

Notes

This project is not only made to save the cost of monthly electricity bills, but also to save the environment and reduce the effect of the greenhouse gases which increased because of fossil fuel consumptions while producing the electricity, and all types of renewable energy are necessary to be used to save the environment and entire world from the dangerous of fossil fuels consumption.

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Metaphor Perceptions of Social Studies Teachers Regarding the Conceptions of Freedom and Justice

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Abstract: Using metaphors in education is a very effective method, especially in terms of learning abstract concepts and being memorable. For this reason, teachers use frequently metaphors in order to understand the concepts in their lessons. This study aims to determine teachers' perceptions of freedom and justice concepts through the metaphors they produce for these concepts, which are abstract concepts and are important for social studies course. Phenomenology was used in data collection and interpretation to reveal the thoughts and interpretations of what was said. The working group of the research is 43 social studies teachers, 21 of whom are female and 22 of whom are male, working in Turkey's different provinces and schools affiliated to the Ministry of National Education of Turkey. The study group was determined by purposeful sampling method. An interview form developed by the researchers was used to collect the data. The collected data were analyzed by content analysis method. The teachers who participated in the study produced many metaphors with very different qualities for the concepts of freedom and justice. A total of 33 metaphors have been produced for the concept of freedom, and in these metaphors, freedom is mostly compared to being or concepts such as bird, flying and sun. At the same time, different metaphors such as swing, drinking coffee, screaming were also produced. In a total of 28 metaphors produced for the concept of justice, justice is mostly compared to the sun, balance and mother respectively. On the other hand, different metaphors such as coin, flower, worker were also produced by the participants for justice. The metaphors produced for both freedom and justice are included in different conceptual categories. Some of the metaphors was produced are quite suitable and functional to explain and teach the concepts of freedom and justice, but it is noteworthy that some of them do not have these qualities. New studies may be conducted to determine the reasons for producing inappropriate or invalid

metaphors. In addition, educational activities can be carried out in schools and out of school areas to understand and adopt the concepts of freedom and justice correctly.

Keywords: Justice, Freedom, Social Studies Teacher.

Introduction

The concept of metaphor is defined as “mecaz” in the Turkish dictionary (Türk Dil Kurumu, 2020). It has been used as a "simile" and "metaphor" in Turkish, and a metaphorical meaning has been attributed (Uzunöz, Aktepe, & Özağaçhanlı, 2020). The origin of the concept of metaphor comes from the concept of "Metaphora", which is Latin and Greek. This concept, which has a combined structure, consists of the words Meta and Pherein (Öztürk, 2007).

The views of some researchers on the definition of the concept of metaphor are as follows; According to Öztürk (2007); the concept of metaphor is a linguistic analogy that people often use in their daily lives. In the field of education, while teaching something new, it is the use of equivalent concepts interchangeably in order to facilitate this teaching process and increase the retention, according to Mutluer (2015); metaphors are indirect expression in its most general form, according to Çağlar Karapınar and Arıbaş (2017); According to Beldağ and Geçit (2017), metaphor reveals people's perceptions of concepts and is a concrete reflection of people's inner world; According to Boğazlıyan and Yılmaz (2018); Metaphors are defined as methods used in understanding and explaining abstract concepts and theories in education.

When the contents of social studies textbooks used in education and training are examined, abstract concepts are quite diverse among the concepts used. The concepts of “justice, giving importance to family unity, independence, peace, being scientific, industriousness, solidarity, sensitivity, honesty, aesthetics, equality, freedom, respect, love, responsibility, savings, patriotism, benevolence” are among the values included in the social studies curriculum (MEB). , 2018). The subject area of the social studies course is people and their lives. Therefore, social studies course has an important place in teaching values (Safran, 2014). Considering the abundance of abstract concepts in the textbooks and considering the difficulties in teaching these concepts, it is seen that the teacher has important duties. Concretizing these concepts and transferring them to the student will both facilitate understanding and ensure retention in mind. Metaphors developed by teachers about abstract concepts will contribute positively to the learning process. For this reason, the use of metaphor method is a very effective method in education and training.

Metaphors are not just a method and concept used in the field of education. People feel the need to express themselves in the environment they live in, and in order to be more understandable while expressing themselves, they liken the abstract concepts that are difficult to express to other different concepts, and they generally use concrete concepts while doing this. Thus, metaphors are frequently used in every field of daily life such as

literature, art, philosophy, politics, architecture, as well as education. In this way, people give some clues about their feelings and thoughts without realizing it. The way of expressing oneself in this way by comparing concepts to each other is called metaphor (Memişoğlu & Taşkın, 2019).

When the literature is examined, many metaphor studies have been carried out in the field of social studies. The participants of these studies are mostly teacher candidates and secondary school students. In addition, when we look at the studies, it is seen that mostly the concepts of History and Geography course content are composed of concepts such as "Democracy, Coup, Environmental Problems, Geography, Savings, Citizenship, Atatürk, Social Studies, Identity, Peace" (Koçoğlu, 2014; Meral, Küçük and Gedik, 2016; Erdilmen Ocak, Çiydem and Mindivanlı Akdoğan, 2017; Şehirli, 2018; Seyhan, 2019; Uzunöz et al., 2020).

The aim of this study is to examine the perceptions of social studies teachers about the concepts of freedom and justice with the help of metaphors. In this context, answers to the following questions were sought in our study:

1. What are the metaphor perceptions of Social Studies teachers towards the concept of freedom?
2. Under which conceptual categories are the metaphors produced by Social Studies teachers for the concept of freedom?
3. What are the metaphor perceptions of Social Studies teachers towards the concept of justice?
4. Under which conceptual categories are the metaphors produced by Social Studies teachers for the concept of justice?

Method

Research Pattern

In this study, phenomenology design, one of the qualitative research designs, was used in order to reveal the perceptions of social studies teachers about the concepts of freedom and justice. Phenomenology reveals individuals' perceptions of the phenomenon, their thoughts, and the meanings they derive (Patton, 2014). Phenomenology enables to reveal and describe the essence of experiences (Merriam, 2018). The use of metaphor makes the meanings that are not purely structured in qualitative studies understandable and tends to categorize them (Shmitt, 2005).

Working Group

The study group of the research consists of 43 social studies teachers working under the Ministry of National Education in different provinces of Turkey in the fall semester of the 2020-2021 academic year. In the research, it was aimed to explain the subject in the best way by using the purposeful sampling type (Baltacı, 2018).

Table 1. Demographic Information of the Working Group

	Variable	Frequency	Percent
Gender	Woman	22	51.2
	Man	21	48.8
Age	23-40	35	81.39
	40 and over	8	18.60
Seniority	1-8 years	37	86.04
	15 and above	6	13.95
Institution	State	28	65.11
	Special	15	34.88
Total		43	100

When Table 1 is examined, the study group consists of 22 female and 21 male participants of the social studies teachers participating in the study. While 35 of these participants are between the ages of 23-40, the remaining 8 participants are 40 years old and over. If we examine the level of seniority, it is seen that the majority of the participants, namely 37 people, have a term of office between 1-8 years and 6 people have a seniority of 15 years or more. Considering the institution where they work, we see that 28 participants work in the state and 15 participants in a private school.

Data Collection

The "justice and freedom metaphor form" developed by the researchers was used to collect the data. While creating this form, various metaphor studies in the literature (Kılcan & Akbaba, 2013; Kaya, 2014; Durmuş & Baş, 2016; Çelikkaya & Seyhan, 2017; Egüz & Kesten, 2018; Faiz & Avcı, 2019; Dolanbay & Bülbül, 2019; Şekerci and Doğan, 2020; Aktepe, Uzunöz and Sarıçam, 2020) were examined. While 4 of the 6 questions directed to social studies teachers in the form are questions containing demographic information (gender, age, institution and tenure), the other 2 questions are about teachers' perceptions of the concepts of freedom and justice. The questions that reveal these perceptions are "Freedom.....similar. Because;..... and Justice.....similar. Because it is....." Firstly, likening the concepts to something and explaining the reason and reason revealed the perceptions of the teachers about the concepts.

Analysis of Data

The data collected in the research were subjected to content analysis. It is used to make sense of the messages to be conveyed in an impartial and systematic way and to reveal the relations between them. (Buyukozturk, Akgun, Demirel, Karadeniz and Cakmak 2008). The following steps were followed in the analysis of the data.

Naming Phase: Metaphors created by social studies teachers are numbered and listed.

Coding and Extraction Phase: After the metaphors created by social studies teachers were numbered separately, these forms were examined and 3 metaphor forms that gave incomplete answers to the questions were eliminated. After the eliminated forms, the study continued with 43 interview forms.

Category Development Stage: Metaphors produced by social studies teachers for the concept of freedom and justice were separated according to their common characteristics. The categorization process was carried out by taking into account the similar justifications of the concepts produced. 5 conceptual categories belonging to the concept of freedom and 7 conceptual categories belonging to the concept of justice were created.

Phase of Ensuring Validity and Reliability: In order to increase the validity of the study, data collection and analysis process were tried to be explained in detail, direct quotations were made from the obtained data and these quotations were included in the findings section.

In addition, Yıldırım and Şimşek (2011) emphasized the importance of detailed reporting in ensuring validity. At the beginning of the teacher metaphors presented with direct quotations, the information was coded. SBO = social studies teacher, Number = number order in coding, F/M = gender.

Stage of Transferring the Data to the Computer Environment: After the identification of 43 metaphors and the creation of the conceptual categories formed by these metaphors, all the data were transferred to the computer environment, and the frequency (f) and percentage (%) were calculated.

Results

In this section, the metaphors produced by the social studies teachers participating in the study about the concept of "justice" and "freedom", the categories created by these metaphors and the answers given by some social studies teachers are included.

1. Findings Regarding the First Sub-Problem

Metaphors produced by social studies teachers regarding the concept of "freedom" are given in Table 2.

Table 2. Metaphors Produced by Social Studies Teachers Regarding the Concept of Freedom

Metaphor name	Frequency	Metaphor name	Frequency
	f		f
Bird	10	Railway	1

Metaphor name	Frequency	Metaphor name	Frequency
	<i>f</i>		<i>f</i>
Sun	2	This	1
Fly	1	Ocean	1
Swing	1	Child	1
Sea	1	National border	1
The fish	1	Rain	1
Weather	1	Feeling	1
Dream	1	Live life	1
Mind	1	Feeling	1
Book	1	Escaping ball	1
Breath	1	Looking at the sky	1
Drink coffee	1	Sky	1
Oxygen	1	Brain	1
Defoliation	1	Conscience	1
Leaf	1	Scream	1
Scales	1	Heat	1
Stream	1		
		Total	43

When Table 2 is examined, it is seen that 43 people produced 33 different metaphors in total for the concept of "freedom" by social studies teachers. According to the table, the most repeated concept is the bird ($f=10$) metaphor. The most repeated concept right after is the sun ($f=2$) metaphor.

According to the table above, each of the remaining metaphors, including the concepts of swing, sea, scales, book, river, leaf, conscience, scream, was used once ($f=1$). The opinions of some participants regarding these metaphors are given below. These;

SBÖ8K: "Freedom is like a sound mind. Because; He knows where and what to do, his limits briefly."

SBÖ16K: "Freedom is like oxygen. Because; Freedom is as valuable and necessary as life."

SBÖ35E: "Freedom is like a ball running into your old grandfather's garden in the neighborhood. Because; If you go beyond your limits, you will explode."

SBÖ20K: "Freedom is like water. Because; its absence will deprive a person of life."

2. Findings Regarding the Second Sub-Problem

The conceptual categories of metaphors produced by Social Studies teachers for the concept of "freedom" are given in Table 3.

Table 3. Categories of Metaphors Produced by Social Studies Teachers for the Concept of Freedom

Categories of Freedom Metaphors	Frequency (<i>f</i>)	Percent (%)
Freedom as a Limited Being	13	30.23
Freedom as an Unlimited Being	11	25.58
Freedom as a Source of Life	11	25.58
Freedom as a Changeable Being	4	9.30
Freedom as a Responsible Value	4	9.30
Total	43	100

2.1 Findings of the Categories Related to the Concept of Freedom

Freedom as a Limited Being

Freedom category 13 ($f=13$) as a limited entity with the metaphors of bird, ocean, railway, escaping ball, country borders, fish, sea, mind, leaf, swing was used by the teacher. Bird metaphor 3 ($f=3$) was produced by the teacher and is the most frequently produced metaphor in this category. Some teacher statements in this category are given below.

SST1E: "Freedom is like a swing. Because; No matter how much we feel like we are flying while swinging, we actually have a foundation and roots to which we depend."

SBÖ27E: "Freedom is like a railway. Because; You can travel all over the world, but you have to stop at some stations. You cannot infringe on someone else's rights."

SBÖ28E: "Freedom, on the other hand, is like the borders of the country. Because; We can go anywhere inside. It's like traveling. But we can't go out of bounds. Visa, passport, etc. required for this. we must take. Freedom also has a limit. We cannot intrude on someone else's rights."

Freedom as an Unlimited Being

The freedom category 11 ($f=11$) was used by the teacher as the bird, flying, looking at the sky, feeling, and the sky metaphors as an unlimited being. Bird metaphor was produced by 7 ($f=7$) teachers and is the most frequently produced metaphor in this category. Some teacher statements in this category are given below.

SBÖ19E: "Freedom is like flying. Because; There are no obstacles in front of you when you fly."

SBÖ37K: "Freedom is like a bird. Because; He can fly anywhere he wants, there are no limits. In doing so, it will not harm any living thing."

SBÖ36E: "Freedom is like a bird. Because; Flying wherever you want, in any direction, is not something everyone will have."

Freedom as a Source of Life

Freedom category 11 (f=11) was used by the teacher as the source of life, which includes the metaphors of living life, sun, belief, air, oxygen, sun, breath, water, cleanliness and child. The sun metaphor 2 (f=2) was produced by the teacher and is the most frequently produced metaphor in this category. Some teacher statements in this category are given below.

SST5E: "Freedom is like the air we breathe. Because; You can live without it for a few minutes at most."

SBÖ13K: "Freedom is like oxygen. Because; Freedom is as valuable and necessary as life."

Freedom as a Changeable Being

The teacher used the freedom category 4 (f=4) as a changeable entity with metaphors of emotion, warmth and screaming in the book. Some teacher statements in this category are given below.

SBÖ10E: "Freedom is like a book open to interpretation. Because; Everyone has something to read and learn from. Naturally, freedom can be perceived as everyone's own interpretation."

Freedom as a Responsible Being

Freedom category 4 (f=4) was used by the teacher as a responsible entity with the metaphors of drinking coffee, falling leaves, running water, and the brain. Some teacher statements in this category are given below.

SBÖ12E: "Freedom is like drinking coffee after work. Because; You are now a person who has completed his responsibility, not escaped from it. When you do not fulfill your responsibility, everything you do is escape, not freedom."

3. Findings Regarding the Third Sub-Problem

Metaphors produced by social studies teachers regarding the concept of "justice" are given in Table 4.

Table 4. Metaphors Produced by Social Studies Teachers Regarding the Concept of Justice

Metaphor name	Frequency	Metaphor name	Frequency
	<i>f</i>		<i>f</i>
Sun	9	Nature	1
Scales	5	Sword	1
Mom	3	Feeling	1
This	2	God	1
Change	1	Ocean	1
Fire	1	Locomotive	1

Metaphor name	Frequency	Metaphor name	Frequency
	<i>f</i>		<i>f</i>
Conscience	1	Capital city	1
Candle light	1	Breath	1
Human body	1	True	1
Mercy	1	Mother and father	1
Flower	1	Heart	1
Employee	1	Trivet	1
Rainbow	1	Knife	1
Bus	1	Death	1
		Total	43

When Table 4 is examined, the most frequently repeated metaphors are sun ($f=9$), scales ($f=5$), mother ($f=3$) and water ($f=2$), respectively. Apart from these, each of the other metaphors was used once ($f=1$). The opinions of some participants regarding these metaphors are given below. These;

SBÖ18E: "Justice is like the sun. Because; When the sun gives its heat to every living thing as much as necessary, it will ensure the continuity of the ecological balance. Here, if justice is provided as necessary, the order of humanity will also gain continuity.

SBÖ15E: "Justice is like workers in a factory. Because; Just as there is no factory without workers, there cannot be an unjust society."

4. Findings Regarding the Fourth Sub-Problem

The conceptual categories of metaphors produced by Social Studies teachers for the concept of "justice" are given in Table 5.

Table 5: Categories of Metaphors Produced by Social Studies Teachers for the Concept of Justice

Categories of Justice Metaphors	Frequency (<i>f</i>)	Percent (%)
Justice as Equality	14	32.55
Justice as a Necessary Entity	11	25.58
Justice as an Inaccessible Entity	5	11.62
Justice as a Light Source	4	9.30
Justice as a Sign of Truth	4	9.30
Justice as a Sharp Entity	3	6.37
Justice as a Controlling Entity	2	4.65
Total	43	100

4.1 Findings of the Categories Related to the Concept of Justice

Justice as Equality

The justice category 14 (f=14) was used by the teacher as equality, which included the metaphors of the sun, scales, flowers, nature, ocean, parents, and hairpin. The metaphor of the sun was used by 4 (f=4) teachers, and the metaphor of scales by 4 (f=4) teachers in this category. Some teacher statements in this category are given below.

SBÖ7E: "Justice is like the Sun. Because justice is to act equally and balanced. It is like the light and heat that the Sun radiates to all parts of the Earth as needed or required. It is a set of universal rules, in which the measure of every good and evil will not be the same, and that every punishment and reward will be different."

SBÖ10E: "Justice is like a scale. Because; All humanity should benefit equally from it."

SBÖ21K: "Justice is like nature. Because nature; It does not discriminate between humans, animals and plants. It is for all. Justice does not discriminate against language, religion, race or color. It is for everyone."

SBÖ42K: "Justice is like a tripod with three legs. Because; It means nothing without equality, social rights and human values."

Justice as a Necessary Entity

The justice category 11 (f=11) was used by the teacher as a necessary entity, which included the metaphors of human limb, mother and her children, compassion and understanding, workers in the factory, mother, locomotive, sun, water and breath. In this category, the metaphor of the mother 3 (f=3) is the metaphor produced by the teacher and produced the most. Some teacher statements in this category are given below.

SBÖ8K: "Justice is like the limbs of the human body. Because; Just as a person experiences difficulties in the absence of limbs, life is filled with difficulties in the absence of justice."

SBÖ27E: "Justice is like the locomotive of a train. Because; If there is no locomotive, wagons are useless. Justice is the engine of society."

SBÖ31E: "Justice is like the fresh water found in nature. Because; Without water, it is impossible for living things to live, develop and produce products. Living things should get water in proportion to their needs so that all of them can exist on earth."

SBÖ32E: "Justice is like breathing. Because; Being alive makes life, not being killed kills. It is balance, it is inward, it is human, and the genius is divine."

Justice as an Inaccessible Being

Justice category 5 (f=5) was used by the teacher as an inaccessible entity with the metaphors of the sun, god, rainbow, a unique product, and a bus. Some teacher statements in this category are given below.

SBÖ19E: “Justice is like a bus. Because; You say it's complete, but there's always space behind.”

SBÖ24E: “Justice is like God. Because; Even if it is abstract, you want it to have a real-life response.”

Justice as a Light Source

Justice category 4 (f=4) was used by the teacher as the light source with the metaphors of the sun and candlelight. The sun metaphor was produced by 3 (f=3) teachers and was the most produced metaphor in this category. Some teacher statements in this category are given below.

SBÖ1E: “Justice is like the sun. Because; It offers prosperity (illuminates with its light) wherever it reaches, unless there is an artificial obstacle in front of it.”

SBÖ6K: “Justice is like candlelight. Because; It illuminates whichever way it falls.”

SBÖ38K: “Justice is like the rising sun because both illuminate people with their presence.”

Justice as a Sign of Truth

Justice category 4 (f=4) was used by the teacher as an indicator of truth, including the metaphors of conscience, death, truth, and coin. Some teacher statements in this category are given below.

SBÖ5E: “Justice is like conscience. Because; never wrong. Justice will be served sooner or later. No justice can provide an account that your conscience cannot give.”

SBÖ20K: “Justice is like death. Because; Sooner or later it will definitely manifest itself.”

Justice as a Sharp Being

Justice category 3 (f=3) as a sharp entity with metaphors of knife, sword and fire was used by the teacher. Some teacher statements in this category are given below.

SBÖ22K: “Justice is like a sword. Because; is sharp.”

SBÖ43E: “The blade of justice is similar. Because; It's like a knife, it hurts you for what you've done. If you are guilty of things you did not do, he will cut the rope and save you while your hands are tied.”

Justice as a Controlling Entity

Category 2 (f=2) as a controlling entity with capital and heart metaphors was used by the teacher. Some teacher statements in this category are given below.

SBÖ28E: “Justice is like the capital of a country. Because; If a problem occurs in the capital, it affects the whole country. Whether or not there is justice in society affects everyone.”

SBÖ40E: "Justice is like the heart. Because; When there is a problem in the heart, it is reflected in all organs, the quality of life decreases, and sometimes we can lose our lives. Justice is like the heart in every environment it is in, it is indispensable for living and when there is a deficiency in justice, it spreads to all of us."

Discussion, Conclusion and Recommendations

Metaphors are widely used in the field of education as well as in various fields and practices of life. Because the use of metaphor is a very useful and effective method especially in terms of learning, comprehending and retaining abstract concepts. For this reason, teachers frequently resort to the use of metaphors in their lectures. The use of metaphor is also very common in social studies teaching, and there are many studies in the literature on the use of this method. Most of these studies are related to the teaching of history and geography subjects. On the other hand, it has been determined that the number of studies on the concepts of justice and freedom is quite low.

In this study, which aims to determine the perceptions of social studies teachers about the concepts of freedom and justice, it is revealed what the teachers liken to "freedom" and "justice" and which conceptual category the object they liken is in. A total of 33 different metaphors for the concept of "freedom" were produced by 43 social studies teachers who participated in the study. In these metaphors, freedom is most likened to a bird or flying like a bird. The reason for these comparisons; It is the thought that being a bird and flying removes the limitations, addiction and obstacles, and allows to go and travel freely wherever one wants. Therefore, it is concluded that the participants perceive freedom as getting rid of borders, obstacles and addiction. After the bird and flying, the second being that freedom is most likened to is the sun. The reason for this is that the sun is the source of life, heating and illuminating all beings. Some other metaphors that draw attention to which freedom is likened are beings that are indispensable for life, such as oxygen/air, breathing, water, and rain. Thus, it is understood that the participants consider freedom as a necessary requirement for human life. In the studies conducted by Çengelci-Köse and Kantekin (2019) and Toy et al. (2020) on social studies teacher candidates, it is seen that the participants produced many and very different metaphors for the concept of freedom. Some of the most produced metaphors in both studies have the same or similar qualities with the metaphors in this study. These metaphors include bird, flying, kite, sun, oxygen, breath, water, rain, ocean, sky, etc. example can be given. In this case, it can be said that most of the people have common or similar perceptions of freedom. In this study, different and incompatible with the concept of freedom such as swing, drinking coffee, screaming, railway, escaping ball, as well as nature elements such as the ocean, river, sky, and warmth, were also expressed. Similarly, in the works of Çengelci-Köse and Kantekin (2009) and Toy et al. (2020), it is seen that many unusual and incompatible metaphors are produced. Some of the incongruous or unusual metaphors in Çengelci-Köse and Kantekin's (2009) study are field, sports, tears, software, movies, babies. Some of the incongruous or unusual metaphors in the study of Toy et al. (2020) are football, emptiness, snowflakes, student living in dormitory, astronaut, non-existence. Therefore, although many people have a common or similar

perception of freedom, it is understood that there are many people who have different and extraordinary perceptions apart from the general.

When we look at the metaphors of freedom produced in this study in terms of concept categories, it is seen that 30% of the participants liken it to assets with limited freedom, 25% to unlimited assets, and 25% to assets that are sources of life. 10% of the participants perceive freedom as a changeable phenomenon, while the other 10% perceive freedom as a value that requires responsibility. Therefore, it is obvious that the participants have different perceptions of freedom in terms of concept categories.

The metaphors produced by the teachers constituting the research group regarding the concept of "justice" are also quite diverse. Participants produced a total of 28 different metaphors for this concept, among which "justice" was most likened to the sun, scales, mother and water. The idea underlying the analogy of justice to the sun, as well as freedom, is that the sun is a source of life, that it illuminates and warms all beings without discrimination, and that it provides every creature with energy appropriate to its quality and as much as it needs. Therefore, the participants who make this analogy think that justice is compulsory for everyone, and that justice will be realized when everyone is provided with rights and opportunities in line with their qualifications and needs. It is understood that the participants who use the metaphor of Libra perceive justice as equality, measure and balance. The third most used metaphor for justice is the mother. It is understood that these participants perceive justice as the basis of individual and social life. In addition to vital elements such as nature, water, breath, and heart, it has also been likened to different entities such as coins, flowers, workers, buses, knives, locomotives, capitals, and rainbows. In the study conducted by Memişoğlu and Taşkın (2019), it is seen that the concept of justice is mostly identified with concepts such as scales, sun, water, air, mother, father, honor, marriage, and family. In the study conducted by Çengelci Köse et al. (2019), the concept of justice is most likened to beings such as scales, sun, water, oxygen, mother, and knife. The fact that many metaphors produced in the two studies and in this study are the same or similar indicates that most of the people have similar perceptions of justice; shows that they see justice as a necessary requirement for social life. However, as in this study, metaphors in the form of glue, salt, mathematics, sand, executioner and needle produced in the study of Memişoğlu and Taşkın (2019) and the disabled individual, boomerang, organ and pencil produced in the study of Çengelci Köse et al. It is seen that non-metaphors are produced. Therefore, it is understood that the concept of justice is perceived in many different ways, just like the concept of freedom. In addition, as in this study, it is seen that many metaphors that are incompatible with the concept of justice and invalid are produced in other studies.

In this study, when the metaphors related to justice are examined in terms of concept categories, it is understood that most of the participants perceive justice as an indispensable necessity, source of life, measure, punishment and control mechanism when necessary. Some participants describe justice as an unattainable phenomenon, thus seeing it as an ideal.

There has been rapid development and transformation in our educational systems (Noroozi, O. & Sahin, 2022a, 2022b). The use of appropriate metaphors is as important as the use of metaphors in education. An inappropriate

metaphor does not provide a correct understanding and comprehension of the subject or concept. Moreover, wrong metaphor can cause it to be learned completely wrong or to settle in the mind with an inappropriate connotation. Considering the place of early learning in the life of the individual and its decisiveness for later learning, it is better understood how important correct learning is. Therefore, teachers should be very careful when using metaphors and choose metaphors that will create an appropriate meaning and connotation in the mind of the student.

As psychosocial individuals, teachers' interests, expectations, upbringing, education, etc. It is natural for them to produce different metaphors on the same subject in line with their characteristics. However, coin, swing, drinking coffee, leaf, escaping ball, scream, bus, rainbow, flower, emotion, death etc. produced for the basic concepts of both life and social studies course such as freedom and justice. Some metaphors are suggestive. Because it is very difficult to connect these objects or situations with the concepts of freedom or justice. Assuming that the same teachers use these metaphors in order to teach the students about the concepts in question, it is thought that the relevant students will not have a correct perception and understanding of the concepts of freedom and justice. Perception is a subjective process and each individual has a perception within the framework of his own world of meaning. However, concepts are linguistic signs on which socially agreed upon meanings. Therefore, it is of great importance that the concepts are used within the framework of this common consensus in order to make a correct interpretation. For a correct understanding, the metaphors used must also be appropriate and functional. Thus, the use of metaphor emerges as an issue that should be emphasized in teacher education and teaching profession. In this context, studies can be conducted to determine the reasons why teachers or prospective teachers produce metaphors that are incompatible with the concepts of freedom and justice and that are invalid.

In order for the concepts of freedom and justice to be adopted and internalized by all citizens, these concepts can be given wide coverage and special applications can be made in the relevant courses at primary, high school and university levels. In addition, seminars, conferences, panels, workshops, etc., in schools, public institutions and areas for public participation. Awareness can be increased by carrying out activities. Again, educational studies can be carried out to increase awareness through the media.

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Identification of Mycoplasma in a Group Population of Tirana


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Abstract: Mycoplasma is one of the main pathogens it causes: non-gonococcal urethra, cervicitis, pelvic inflammatory disease, orchitis, epididymitis and infertility in men and women. These pathogens attack and destroy urogenital epithelial cells and cause sexually transmitted infections. Clinically sexually transmitted diseases can be caused especially by genital mycoplasmas (*Mycoplasma hominis* and *Ureaplasma urealyticum*) both in women and men. The key to treating and preventing genital mycoplasma infections is timely and accurate diagnosis. Laboratory diagnosis of mycoplasmatic infections is based on bacteriological tests including: morphology, culture characteristics, physiological and serological properties. New tests based on molecular analysis of DNA, ribosomal RNA and cellular proteins are also being used to identify mycoplasma. Suitable sampling for mycoplasma detection includes: urethral tampon, urine, endocervical tampon, and endometrial biopsy. In our study the Mycoplasma IES kit is used to identify *Mycoplasma hominis* and *Ureaplasma urealyticum*. The group of individuals taken in the analysis were 80 individuals, among whom 61 women and 19 men, from 15 to 65 years old. 65% (52/80) of samples included in our study results positive for *Mycoplasma hominis* and *Ureaplasma urealyticum*.

Keywords: Epithelial cells, Genital mycoplasma, *Mycoplasma hominis*, *Ureaplasma Urealyticum*, Mycoplasma IES Kit.

Introduction

Mycoplasmas are smaller than conventional bacteria and lack a cell wall, which prevents mycoplasmas from staining by Gram stain. Several species of mycoplasmas and ureaplasmas are now well-known human pathogens responsible for a broad array of conditions involving the respiratory and urogenital tracts of adults and infants and they may cause severe systemic disease in susceptible hosts (Waites *et al.*, 2013). Some

Mycoplasma species are spread through sexual contact and there is a growing evidence of clinical importance of infections caused by genital mycoplasmas that include various Mycoplasma and Ureaplasma species (Ljubin-Sternak & Meštrović 2014).

Mycoplasma is one of the main pathogens it causes: non gonococcal urethra, cervicitis, pelvic inflammatory disease, orchitis, epididymitis and infertility both in men and women (Bachmann et al., 2015; Gaydos *et al.*, 2009; Han *et al.*, 2020; Penna *et al.*, 2005). In the pathogenesis of genital mycoplasmas is not only one factor important but there are several as: (a) expression of specific adhesion proteins; (b) antigenic variation; (c) production of enzymes; and (d) facultative intracellular localization (Waites *et al.*, 2005). The terminal structure (variable adherence-associated (Vaa) adhesin) of *Mycoplasma hominis* and adhesins (sialyl residues and/or sulfated compounds) of *Ureaplasma urealyticum* facilitates their attachment to epithelial cells, to spermatozoa and erythrocytes (Razin *et al.*, 1998; Boesen *et al.*, 2001; Waites *et al.*, 2005).

The key to treating and preventing mycoplasma infections is timely and accurate diagnosis. Laboratory diagnosis of mycoplasmatic infections is based on bacteriological tests including: morphology, culture characteristics, physiological and serological properties. New tests based on molecular analysis of DNA, ribosomal RNA and cellular proteins are also being used to identify mycoplasma. (Waites *et al.*, 2012) Suitable sampling for mycoplasma detection includes: urethral tampon, urine, endocervical tampon, and endometrial biopsy.

The Mycoplasma IES kit is a diagnostic assay for culture isolation and identification of *Mycoplasma hominis* and *Ureaplasma urealyticum* from genital samples. The Mycoplasma IES kit was found to be equivalent or superior compared to other commercial culture-based assays for a rapid and accurate identification of *U. urealyticum* and *M. hominis*. It might be considered a cost-effective tool for detection of these organisms, particularly attractive in developing countries (D’Inzeo *et al.*, 2017).

Materials and Methods

This work was carried out in the period January -December 2021 in Faculty of Natural Sciences, Tirana, Albania in collaboration with other clinical microbiology laboratories. For the realization of this study, biological samples (vaginal and urine samples) were collected and taken, which were collected according to the relevant procedures and stored according to appropriate conditions. During the period January -December 2021, the group of individuals taken in the analysis were 80 individuals, among whom 61 women and 19 men, from 15 to 65 years old, presented in the microbiological laboratory, suspected of the presence of mycoplasma infection.

Mycoplasma IES kits (Autobio, Zhengzhou, China), Figure 1, were used to perform the identification of *Mycoplasma hominis* and *Ureaplasma urealyticum*. Mycoplasma IES kit is based on culture and biochemical reactions. The ground is prepared by mixing lyophilized powder and diluent. All specimens were cultured

within 24 hours of collection. Swabs were suspended into 1.2 ml of saline solution and before inoculation stays in RT for 30 min. Mycoplasma IES testing was performed by putting 300 µl of the suspension into the medium. Following, 100 µl of the suspension were inoculated into the wells of the strip. One drop of mineral oil was added to each well. Strips were incubated at 37°C for 24 hours. Once the mycoplasma is cultured, urea can be degraded from urease in the case of *Ureaplasma urealyticum* and release ammonia, while arginine can be degraded from arginase in the case of *Mycoplasma hominis* and release ammonia. Ammonia increases the pH of the liquid ground, the result is seen according to the color change of the indicator.



Figure 1. Mycoplasma IES Kit (Well Number 5 (C +): Positive Control; Well Number 1 (UU): Identification of *U. Urealyticum*; Well Number 2 (MH): Identification of *M. Hominis*.

The observed data were presented in mean value and in standard deviation. Discrete data were presented in absolute value and in percentage. The data were presented by means of tables and graphs of different types, type diagrams and surface diagrams. SPSS statistical package is used for data analysis.

Results

A total of 80 samples were included in this study, where 61 of them, or 76.25% of cases belong to women, while 19, or 23.75% of cases belong to men. The mean age value is 31.17 years, with a standard deviation of 8.67. 65%. (52/80) of cases results positive for *Mycoplasma hominis* and *Ureaplasma urealyticum*. *Mycoplasma hominis* (MH) was detected in 7.5% (6/80) of samples, *Ureaplasma urealyticum* (UU) was detected in 30% (24/80) of samples and 27.5% (22/80) of samples were positive for both genital mycoplasmas. 72.13% of women and 42.11% of men results infected with genital mycoplasmas (see Table 1).

To observe the relationship that exists between gender and infections with genital mycoplasmas, we use a statistical test χ^2 since we have qualitative variables presented in Table 1. The test value results $\chi^2 = 5.741$ ($p=0.017$). Since $p < 0.05$, we can say that gender is related to infections with genital mycoplasmas.

Table 1. Distribution of Cases According to Infections in Women and Men.

Gender	Total No. (%)	Positive case			Negative cases No. (%)
		MH No. (%)	UU No. (%)	UU&MH No. (%)	
Women	61 (76.25)	5 (8.20)	20(32.79)	19(31.15)	17(28.87)
Man	19 (23.75)	1(5.26)	4(21.05)	3(15.79)	11(57.89)

The data were grouped into 3 classes and the age range 26-35 years has the highest percentage of individuals, respectively 48.75%, followed by the age group 15-25 years, with 28.75% and the last group >35 years, with 22.5% . The age distribution of positive cases with *U. urealyticum* and *M. hominis*, was higher in the second age group with 32.5%, followed by the first age group 21.25% and the last group with 11.25%.

We compared the distribution of positive cases by time periods: January–March, April–June, July–September and October–December. In Table 2 we see that positive cases have a higher prevalence in the July–September period, with 40.38% of cases, followed by the April-June period at 28.5% of cases.

Table 2. Distribution of Positive Cases According to The Time Period.

Time period	Total No. (%)	MH No. (%)	UU No. (%)	UU&MH No. (%)
January-March	2 (3.85)	0 (0)	1(50)	1(50)
April–June	15 (28.85)	3(20)	7(46.67)	5(33.33)
July-September	21(40.38)	2(9.52)	8(38.10)	11(52.38)
October-December	14 (26.92)	1(7.14)	8(57.14)	5(35.71)

In pregnant women genital infections with genital mycoplasmas result in 73.68% of cases, while 26.32% of them are not carriers of MH &UU. Non-pregnant women are positive in 69.57% of cases and are not carriers in 30.43% of cases (see Table 3).

Table 3. Distribution of Cases by Pregnancy.

	Total No. (%)	Positive case			Negative cases No. (%)
		MH No. (%)	UU No. (%)	UU&MH No. (%)	
Pregnant	38 (62.30)	2 (5.26)	11(28.95)	15(39.47)	10(26.32)
Not pregnant	23 (37.70)	3(13.04)	9(39.13)	4(17.39)	7(30.43)

In the Figure 2 we see that the 26-35 age group of pregnant and non-pregnant women are more affected by genital mycoplasmas, respectively 12 and 8 women, followed by the first age group 15-25 years.

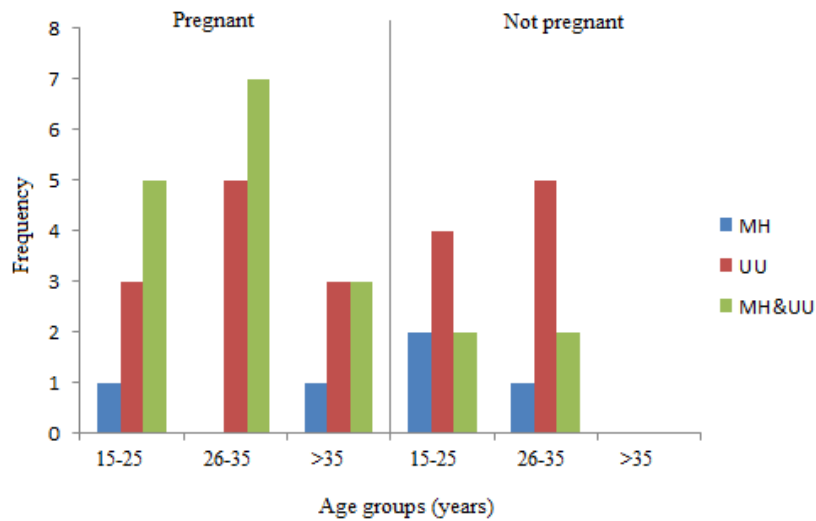


Figure 2. Distribution of Cases by Pregnancy Related to Age Group

Discussion

This study had as purpose the identification of *Mycoplasma hominis* and *Ureaplasma urealyticum* in a group population suspected with infection of genital mycoplasmas in Tirana, thus contributing to a better understanding of genital mycoplasmas infections in women and men in Tirana. Determination of genital mycoplasmas is very important to understand the cause of sexually transmitted infections, it helps in timely and accurate determination of the diagnosis.

Mycoplasma hominis was detected in 7.5% of samples, *Ureaplasma urealyticum* was detected in 30% of samples and 27.5% of samples were positive for both genital mycoplasmas. In total 65% of cases result positive for genital mycoplasmas infections. In other studies total infections varies 35.6-48%, infections with *Ureaplasma urealyticum* varies 11.3-33.47%, infections with *Mycoplasma hominis* varies 0.36-4.6% and with both types varies 4.56-10.4% (Verteramo *et al.*, 2013; Skiljevic *et al.*, 2016; Zheng *et al.*, 2021). Percentage changes may be due to the sample taken in the study and different identifications methods for genital mycoplasmas.

In 80 patients that we analysed result that 72.13% of women and 42.11% of men was infected with genital mycoplasmas. The gender resulted to be related with genital mycoplasmas infections $p=0.017$, maybe due to biological and anatomical changes in women and men. The prevalence of *U. Urealyticum* in our findings, in both men and women, is higher than that of *M. hominis*, as reported other studies (Zheng *et al.*, 2021; Robinson, 2007). In our study 26-35 years pregnant women are more affected by genital mycoplasmas followed by the first age group 15-25 years, as reported in another paper that had observed highest frequency in the 18-34 year age

group (Bayraktar et al., 2010), age groups 21–30 years and 31–40 years (Zheng *et al.*, 2021). This result is expected because the mentioned age group is more sexually active, being prone to unprotected intercourse and a relatively high number of sexual partners.

Mycoplasma IES kits result a very effective solution in determining *Mycoplasma hominis* and *Ureaplasma urealyticum*, easy to operate, cultivation is fast and test results are consistent, as reported by other authors (D’Inzeo *et al.*, 2017; Rahman *et al.*, 2016; Öztürk & Yıldız, 2022).

Conclusion

The key to treating and preventing genital mycoplasma infections is timely and accurate diagnosis. Cultivating them is currently the most reliable method to diagnose these infections. Mycoplasma IES kits result very effective in determining *Mycoplasma hominis* and *Ureaplasma urealyticum*, it’s easy to operate, has a low price and it’s not time consuming. The only significant relations which was found in our study was between gender and infections with genital mycoplasmas infections $p=0.017$.

Recommendations

Seeing the advantages of Mycoplasma IES kits, routine screening can be performed in asymptomatic or symptomatic women and men who carry out a health visit for identification of *Mycoplasma hominis* and *Ureaplasma urealyticum*.


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Opinions of Secondary School Eighth Grade Students upon Distance Education and Preparation Process for High School Entrance Exam during the Pandemic

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Abstract: With the Covid-19 pandemic, the need for examining the effect of distance education process, where millions of students have been caught unprepared, on Turkish education has arisen. It is rather important to reveal the strengths and weaknesses of the education in this process and to give the right direction to the process by overcoming the existing problems. In accordance with this purpose, the opinions of the students in secondary school eighth grade during the pandemic have been taken regarding the Turkish education and preparation process for high school entrance exam in this period. Case study, one of the qualitative research methods, have been used in this research. The data has been collected by using an interview form. The findings of the research have been examined by being categorized in line with the questions in the interview form and presented respectively. Distance education has some shortcomings due to certain reasons in terms of Turkish lesson. Many reasons such as the lack of technological knowledge of the students and teachers, the difficulty to access technological tools, communication difficulties in distance education, have reduced the students' interest in the Turkish lessons and negatively affected the preparation process for the high school entrance exam. It has been observed that the most important effect of the current situation is the loss of motivation of the students.

Keywords: Pandemic, Turkish Education, Distance Education, Student Opinion

Introduction

Distance education is a concept that comes up frequently, especially with the rapid developments in internet technology. Distance education, which is evaluated as different from distance learning by Moore & Kearsley (1996), is defined as an education that contains teaching and learning processes based on the use of various technological applications, according to Buselic (2012). Distance education is to deliver education content to students who are not in the same classroom atmosphere, independently of time and place, by using information technologies (Gökçe, 2008). Distance education is a field of education that focuses on teaching methods and technology with the aim of delivering teaching, often on an individual basis, to students who are not physically present in a traditional educational setting such as a classroom (Honeyman & Miller, 1993).

In case of events that cause cessation or disruption of education such as natural disasters, terrorist incidents and pandemics, a quick solution comes up with distance education applications (Kahraman, 2020). The Covid-19 pandemic has caused some mandatory changes in the way education is implemented by affecting the education system in many countries, and in this context, countries have switched to distance education instead of traditional face-to-face education. Especially in the field of education, which involves a large mass and where interaction is intense, precautions have been taken primarily and put into practice without wasting time. In this way, the decision to suspend education at schools has affected more than 91% of the world's student population. (Miks & McIlwaine, 2020).

Online teaching methods and television-based educations are the most common ones among the platforms that can provide distance education. (Valentine, 2002). For this reason, with the decision to transition to distance education, online media and TV broadcasts started to be used actively in this process in many countries (Stojanovic, El-Khatib, Brandic & Maalouf, 2020). These platforms help to increase the interaction between teachers and students as much as possible to facilitate learning when face-to-face education is not possible, and in this way support distance education to become as close as possible to traditional face-to-face education (Teaster & Blieszner, 1999).

First case in Turkey was detected on March 11, 2020. Direct and indirect effects of this interrupted the daily life routine by bringing some difficulties and this interruption also took effect in the field of education. This pandemic, having spread all around the world, not only negatively affected countries in terms of health; economic, social and cultural aspects, but also put them at a disadvantage in the sense of education (Çakın & Akyavuz, 2020). Accordingly, after the first case in Turkey, education was suspended for a short period of time in pre-school, secondary school, high school and in higher education levels. Then, with the decision of Ministry of National Education and YÖK (Council of Higher Education) together, distance education process was adopted instead of face-to-face education. Since March 23, 2020, the Ministry of National Education in Turkey has included students at every school level in the scope of distance education through three television channels and EBA (Education Informatics Network). In this way, the courses held over the EBA (Education Informatics Network) have been made available via the internet, TRT channel and television, so TV and internet-based distance education platforms have started to be actively used. In order to find solutions to the problems caused by the distance education process, it is significant to identify these problems first. Therefore, there is a need for academic studies in which the opinions of teachers and students who are at the center of distance education are taken and the problems related to distance education are determined.

Purpose of the Research

In this study, it is aimed to determine the existing problems by taking the opinions of the secondary school eighth grade students about distance education and preparation process for the high school entrance exam during the pandemic. In regard to this purpose, answers to the following questions have been sought for:

1. How is the concern and support of the parents of secondary school eighth grade students during the distance education process?
2. What is the attitude of the Turkish teachers of secondary school eighth grade students during the distance education process?
3. What is the effect of distance education process on the Turkish lessons of the secondary school eighth grade students?
4. What is the effect of distance education process on the preparation process for high school entrance exam process for the secondary school eighth grade students?

Method

In this section, information about the research model, sampling, data collection tools and data analysis have been given.

Design of the Research

In this study, qualitative research method and case study design have been used. Case study provides rich descriptive information about the situation under research by benefiting from deep and various sources of information. The factors related to the examined situation are investigated with a holistic approach and focused on how they affect the relevant situation and are affected by this situation (Yıldırım & Şimşek, 2016). Besides, the information obtained from the participants' explanations, opinions and other sources of data are combined to make a decision about the examined situation (Hancock & Algozzine, 2006).

Research Group

The study group of the research consists of 10 boys and 10 girls, 20 students in total who are at the eighth grade in secondary school in Uşak. Criterion sampling method, which is one of the purposeful sampling methods, has been used in the selection of the sampling. Criterion sampling is defined as the study of situations that meet a series of criteria that can be created by the researcher or that can be previously determined (Yıldırım & Şimşek, 2016). In this study, interviewing the eighth-grade students who attend distance education activities with live lessons has been taken as a criterion.

Data Collection Tools and Data Collection

The data of the study have been collected with semi-structured interview forms consisting of open ended questions developed by the researchers. In the interview forms created within the scope of the research, questions have been asked to the study group about the effects of distance education during the Covid-19 pandemic period on Turkish education and the preparation process for the high school entrance exam. The

interview forms used in the research had been prepared in accordance with the purpose of the research, and then they have been examined in terms of structure, scope and language validity by three academicians who are experts in the field of Turkish education.

Analysis of the Data

Descriptive analysis has been preferred in the data analysis. The data, which were collected in the descriptive analysis, determine what has been said or what kind of results have been revealed in connection with the research matter of the study. Categories were determined by considering the questions in the interview form. In the findings of the study, each participant was given a specific code and their views were explained (S1, S2, S3...). Studies have been carried out to ensure the validity and reliability of the research. While preparing the interview form, content validity was ensured by taking expert opinion. In the analysis of the data, the coding was done by three different researchers and compared, thus ensuring the reliability of the study. In addition, it has been aimed to increase the reliability of the study by including the opinions of the participants frequently.

Findings

The findings obtained in consideration of the data collected in the research are remarked by considering the sub-problem order.

Findings about First Sub-Problem

The concern and support of the parents of the study group in the distance education process is shown in Table 1.

Table 1. The Concern and Support of the Parents of the Study Group during Distance Education Process

Concern and Support of the Parents	N	Samples from Students' Statements
Yes. They were concerned and supportive.	13	<p>S4: My parents were concerned. Since we didn't have internet connection at home, they immediately connected one.</p> <p>S16: I am not good with computers. My father taught me how to attend classes.</p>
No. They were not concerned and supportive.	7	<p>S1: As my mother and father work, they didn't care much.</p> <p>S9: My father wasn't concerned, and my mother couldn't help me because she doesn't know how to use a computer.</p>

13 of the students in the study group stated that they had the support of their parents during the distance education process, and 7 of them stated that they did not get any support. The students needed the support of their parents regarding the difficulties they experienced in technological matters and they had a considerable amount of support. It is seen that the parents who could not provide support are working parents. The importance of parent support in education is also observed in the distance education process.

Findings About Second Sub-Problem

The attitude of the Turkish teachers of the study group during distance education process is shown in Table 2.

Table 2. The Attitude of Turkish Teachers of the Study Group during Distance Education Process

The Attitude of Turkish Teachers	N	Samples from Students' Statements
Our teacher was more concerned and diligent.	6	S15: Our teacher made us watch videos to make the lesson more fun. S/he projected questions on the screen and had us solve them. S18: Our teacher was not shouting like in class. Lessons were more productive because the classroom was always quiet.
Our teacher's concern and effort decreased.	11	S10: I think our teacher was tired. It was clear from the tone of her/his voice. S14: Technical problems we experienced from time to time reduced our teacher's motivation. Of course ours, too...
Our teacher's concern and effort didn't change.	3	S2: Our teacher was on time as usual. S4: Our teacher taught the lesson as if we were in the classroom, but some of our friends did not attend the lesson at all.

6 of the students in the study group stated that Turkish teachers were more interested in the distance education process, 11 of them stated that the concern and effort of their teachers decreased, and 3 of them stated that the attitude of their teachers did not change. Based on the opinions of the students, it can be said that there were occasional technical malfunctions in the lessons; however, the teachers paid attention to attend the lessons regularly, on the other hand, the students were reluctant to attend the lessons from time to time. Considering distance education reduces the interaction between teacher and student, this situation is an expected case. In distance education, teachers have crucial duties to make the lessons more efficient.

Findings about Third Sub-Problem

The effect of distance education process on the Turkish lessons of the secondary school eighth grade students is shown in Table 3.

Table 3. The Effect of Distance Education Process on Turkish Lessons of Secondary School Eighth Grade Students

The Effect on Turkish Lessons	N	Samples from Students' Statements
The effect was positive.	4	S17: As we did not waste time going to school during distance education process, we were able to spare more time for homework. S20: The class was quiet. I could hear the teacher more clearly.
The effect was negative.	15	S1: I couldn't focus on the lessons. I usually felt sleepy in front of the screen. S5: Not being with my friends was boring for me. I did not attend most of the lessons.
There was no effect.	1	S2: I think nothing has changed. I still listened to the teacher and did my homework on time.

4 of the students in the study group stated that distance education had a positive effect on Turkish lessons, 15 of them stated that it had a negative effect, and 1 of them stated that this process had no effect on Turkish lessons. In general, it is seen that students complain about the decrease in the efficiency of Turkish lessons during the distance education process. It can be claimed that distance education is insufficient and has deficiencies for language teaching, which is based on four basic language skills.

Findings about Fourth Sub-Problem

The effect of distance education process on the secondary school eighth grade students' preparation process for the high school entrance exam is shown in Table 4.

Table 4. The Effect of Distance Education Process on the Secondary School Eighth Grade Students' Preparation Process for High School Entrance Exam

The Effect on the Preparation Process for High School Entrance Exam	N	Samples from Students' Statements
The effect was positive.	6	S3: The distance education process gained us time to be able to do tests. S7: We attended the classes we wanted, we didn't attend the ones we didn't want to, so we solved questions instead.
The effect was negative.	14	S5: Distance education was boring for me. I did not want to study. S13: I experienced internet problems and couldn't focus on the lessons.

It is seen that 6 of the students in the study group were positively affected by distance education during the high school entrance exam process, while 14 were negatively affected. 70% of the students were negatively affected by this situation. It can be said that students have mostly suffered during the preparation process for the high school entrance exams, which is considered a serious step for the future of the students. Even though some students mention about some positive aspects of it, the distance education process, where there is less interaction and are technical problems, has negatively affected the motivation of students and teachers.

Discussion and Conclusion

In this study, in which it is aimed to determine the existing problems by taking the opinions of the secondary school eighth grade students about distance education and the preparation process for the high school entrance exam during the pandemic, it has been determined that the students have needed the support of their parents in order to overcome the technological deficiencies and that they have had this support to a large extent. In order for the technology policy to be used effectively by the citizens in a country, all individuals should have as much knowledge and access as possible (Ergüney, 2015). In order for students to benefit from the distance education applications as requested, it is essential that they have knowledge about the internet use and access to it. The attitudes of the parents, who play a significant role in distance education, during the pandemic appear as an important factor in the achievement of the educational activities. Therefore, it is important to provide technology literacy training required for distance education to all parents and to inform them about the process. Arslan et al. (2021), in their study in which they examined the views of parents on distance education during the pandemic, they included the suggestions of the parents about this process. Parents notified that expect of distance education, online book reading lessons and longer periods of classes for both themselves and the students.

Based on the opinions of the students, it can be said that there were occasional technical malfunctions in the lessons; however, the teachers paid attention to attend the lessons regularly, on the other hand, the students were reluctant to attend the lessons from time to time. In general, it is seen that students complain about the decrease in the efficiency of Turkish lessons during the distance education process. It can be claimed that distance education is insufficient and has deficiencies for language teaching, which is based on four basic language skills. Besides, 70% of the students were negatively affected by this situation. It can be said that students have mostly suffered during the preparation process for the high school entrance exams, which is considered a serious step for the future of the students. Even though some students mention about some positive aspects of it, the distance education process, where there is less interaction and are technical problems, has negatively affected the motivation of students and teachers. In literature (Kan & Fidan, 2016; Uzoğlu, 2017; Tuncer & Bahadır, 2017), it has been detected that students find distance education advantageous in some aspects and disadvantageous in some aspects.

Alpaslan (2020) and Serçemeli and Kurnaz (2020) examined the views of academicians upon distance education. Mahdy (2020) investigated the effect of distance education on the academic success of Veterinary

School students during the Covid-19 pandemic period. Altun Ekiz (2020) examined the views of the school of physical education and sports students, and Altuntaş Yılmaz (2020) examined the views of physiotherapy and rehabilitation department students on distance education during the quarantine period. Eroğlu and Kalaycı (2020) carried out research about Turkish Language course via the comparison of distance and face-to-face education. Keskin and Özer Kaya (2020) investigated the evaluations of undergraduate and graduate students regarding distance education during the pandemic period, and Yolcu (2020) and Andoh, Appiah and Agyei (2020) examined the evaluations of university students regarding distance education. Alam (2020) researched mutual views on teachers and students regarding distance education during the pandemic period, while Kaden (2020), Kocayığıt and Uşun (2020) and Fidan (2020) researched teachers' opinions on distance education during the Covid-19 pandemic period.

These studies have revealed similar results with our research results. According to the students, there is no superiority or failure of this system on its own. However, it has been concluded that the students mostly prefer face-to-face education and that they consider distance education system is more appropriate as an emergency action plan in times of crisis.

Recommendations

1. Learning outcomes about distance education can be included in the curriculum.
2. Apart from the studies on the evaluation process of the EBA (Education Informatics Network) platform with teachers, studies on content creation for various courses can be conducted.
3. Studies can be carried out to determine what kind of other activities and interesting materials can be used regarding learning and teaching processes in state channels.
4. Support services regarding distance education can be provided for students.
5. Alternative solutions can be developed by improving technological infrastructure facilities.
6. Informative seminars for parents about distance education can be conducted.

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Muslim Centered User Interface Design (MCUID) Framework and MCUID Prototype

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Abstract: Education can be represented in many approaches. One of them uses metaphor to deliver the message in the design environment. There is an assumption that if metaphor worlds become a truly global platform for users, they could be essential to "encode" the flexibility and the opportunity for social interactions to represent cultures. In some of the Al Quran verses, Allah uses metaphor to send His messages to humanity. Inspired by it, the study aims to design an Islamic culture interface. Thus, a Muslim Centred User Interface Design (MCUID) framework has been developed. An interface prototype is designed based on the framework, known as (MCUID) prototype. The framework discusses three aspects, a designer, a user and a product. The method of this study is using a survey with closed card sorting. Bismillah icon is one of the spiritually based culture icons being tested. The analysis was done using Atlas. Ti 7 tabulated the patterns of Muslim users' perceptions and the accurate measurement of icon recognition. This paper's impact emphasises that a good product comes from a good integration between the designer and the user. For future work, education or other domains could apply the MCUID framework as guidelines to design a suitable product for the target user.

Keywords: Education Values, Spiritual Based Culture Icons, Human-Computer Interaction (HCI), Interface Design, Metaphor, Product, Culture Centred Design (CCD), Framework, Perceptions

Introduction

Islam is a comprehensive religion consisting of five characteristics: godliness, humanity, comprehensiveness, moderation, and a combination of stability and flexibility for all universes. Spiritual values are commonly associated with the term *al-ghaib* from the Islamic perspective. It makes an analogy about the phenomenon of cyberspace that requires some idea or appreciation of the metaphysical. In recognising Islamic values/spiritual values, (Dator, 2004) proposes several fundamental values as the manual for developing science and technology. These values consist of *tawhīd* (unity), *khalīfah* (trusteeship), *'ibādah* (worship), *'Ilm* (knowledge), along with some values in opposing pairs: *ḥalāl* (praiseworthy) vs *ḥarām* (blameworthy), *'adl* (social justice) vs *ẓulm* (tyranny), and *istiṣlah* (public interest) vs *dhiya*. (Unus, 1985) classifies these values as primary values, which drive secondary values that correlate to “the process and content of scientific and technological development.” It is believed that it is not easy to develop self-conscience inside, to bring humankind to God-Centred.

Therefore, following an example of the Prophet’s main task as mentioned in the Quran and hadith is significant to get people to good morality. “Verily, I am sent to earth to enhance the glory of moral” (HR Al Bukhari). So, inputting spiritual values into the IT field, specifically interface design, could bring people close to God-Centred thinking. Thus, this paper is on how the mapping of Muslim Centred User Interface Design (MCUID) framework into the development of MCUID prototype and later, hope to educate meaningful values during the interaction. In the following section, the researcher presents the related work with this study, literature review, MCUID framework, followed by the methodology, result and analysis, and the researcher close the discussion with conclusion.

Literature Review

Concept of Human-Computer Interaction

Human-computer interaction is the communication between humans and computers through technology devices with their mutual understanding. The computer should help people on management services and process all the information. Sometimes, the computer should assist people in continuing human life. HCI has been growing to the fourth generation. In (Ni C, 2021), the researcher created a platform for student to improve their oral English.

The researcher has experimented with the student, and the result shows that the platform help student to improve their oral English online. The process of this platform used the idea of the knowledge that is got through the expert. (Majid et al., 2019), human aspects including aesthetic and ergonomics, which will provide a better approach in strengthening the HCI approaches to strengthen the software development process.

Design Psychology

According to the (Liu, 2020), design psychology began to arise in 1940. However, the researcher claims that very few studies were researching on this topic. After decades, this topic became popular among researchers, and more design psychology has been accepted by society. Design psychology aims to help people design things like homes and architectural structures. Most researches found that the research content and psychological can relate to each other because when they combine organically, the design psychology becomes professional and systematic. (Md Sabri et al., 2014), social psychology to be a discipline from which theories, models, and research results can be harnessed for knowledge management.

Human-Centred Design (HCD)

Many HCD tools have been introduced in the research community to support hardware and software integration for related application (de Albuquerque Wheler et al., 2021). The research application the on the design science framework to evaluate the design tools following HCD. Many tools cover steps from inspiration to ideation and implementation. Some are user research, brainstorming, data collection planning and low to high-fidelity prototyping tools. The design should help the community understand the user interface of the application and deliver the solution that can meet the privacy through design principles.

User Interface

User Interface can be defined as the user directly interacting with the device. The complexity of the user interfaces in the application affects user perfection. However, the growth of the technology will make the user adapt to the complexity and the design of the interface. Many things need to be considered to make the interface design successful, such as the mode of interaction, learning curve, the user's cultural background, and the technology used to make the design interface (Miraz et al., 2021).

In (Miraz et al., 2021), state two approaches to designing the user interface. The first is to fulfil the user's need while using the user interface in the application. Second, the designer adds the complexity of the user interface while developing the application. However, this will make the user interface becomes difficult. As the computer adds more embedded functions, the user interface runs the functionality invisible. (Ismail et al., 2013) said the the knowledge of how design elements influence the development the product.

Usability

Usability is defined in engineering as the iterative process but need to agree with the precaution to make it successful and satisfied. Another author also defines usability engineering as the extent to which the end-user can use to achieve the goal with efficiency and effectiveness satisfactory in a specific context. There are five important features of usability engineering, including (safety and security), effectiveness, (efficiency and

functionality),(joy and fun), and (ease of learning and memorising). Study related on (Ariffin & Daud, 2019) user centered and (Mokhsin et al., 2018) framework to analyze problem.

MCUID framework

Figure 1 shows Muslim Centered User Interface design (MCUID) framework. MCUID framework is for user interface design for Muslim users, inclusively considerations in Islamic paradigm and Islamic principles for interface design perspective that involved a designer, a user and a product interface.

ISLAMIC PARADIGM IN INTERFACE DESIGN

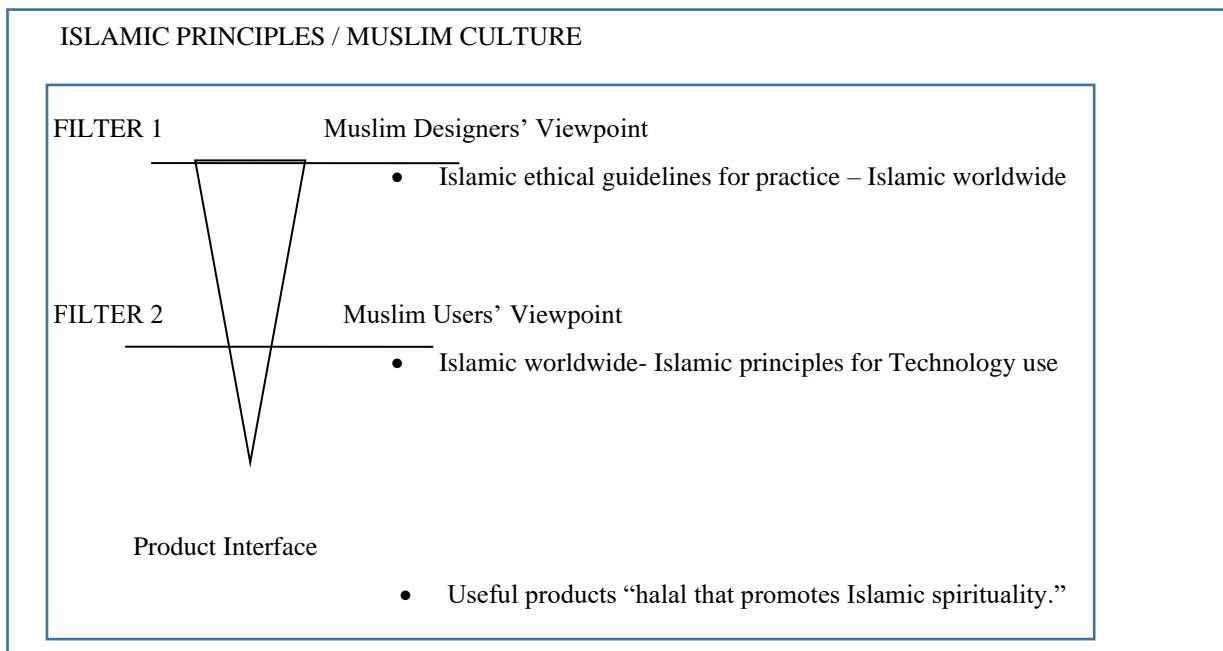


Figure 1. Muslim Centred User Interface Design (MCUID) Framework

The Muslim Centred User Interface Design (MCUID) framework enhances (Shen et al., 2006) work on the cultural filter. The Islamic paradigm bounds the MCUID framework in interface design and Islamic principles/Muslim culture. (Khalijah Mohd Salleh, 2004) reiterates the importance of Tawhid as the paradigm for an Islamic solution in addressing issues of science and technology development. Three basic standards include goodness (improvements for man and society without affecting nature), beauty (being in harmony with the spirit of man and the laws of nature as determined by Allah) and truth (in harmony with the laws of Allah) are seen as the manifestation of *Tawhīd*, the ultimate belief in one God that is Allah. From a holistic perspective, Islamic principles are values of obedience as God’s servant and Khalifah. The development of science and technology is enclosed with primary and secondary values such as worship.

At Filter 1, in Figure 1, Muslim Designers’ Viewpoint is responsible for designing a Product Interface. The Muslim designers should practice the criteria in general principles for software engineers and understand and

follow Islamic ethics to create valuable product interfaces for Muslims. Islam emphasises the Muslim designer who possesses technological knowledge and expertise to be responsible for their own doing. They are accountable to use their intelligence accordingly since they bear the trust of being God’s vicegerents and will be accounted on the Day of Judgment as mentioned in verse 3:30 in the *Qurān*. Futhermore, (Mohd Nor Mamat & Siti Fatahiyah Mahamood, 2004) said ‘Tawhidic ethics’, the feeling of god consciousness or awareness remain the core principle for the development values are determined by *Tawhīd* and guided by *Sharī’ah*., the renowned Islamic scholar, describes *Tawhīd* as the source of scientific spirit and development in Islam. He states that “the scientific spirit of Muslim designers flow, in fact, from their consciousness of *Tawhīd*” (Osman Bakar, 1991). At Filter 2, in Figure 1, is Muslim Users’ Viewpoint, which uses a Product Interface. The Product Interface is located at the bottom of the inverted cone, developed based on a halal interface, promoting spiritual elements. The product interface is incorporated with Islamic ethical guidelines and technology applied based on the theories and concepts of Human-Computer Interaction. The Product Interface is considered a success if Muslim Designers’ viewpoints match Muslim users’ views.

Applying MCUID framework to the designing MCUID prototype

Based on the MCUID framework, Muslim Designers’ Viewpoint at Filter 1, a Muslim designer who intends to design an Islamic culture-based product interface, should be a good Muslim, understand Islam is a way of life. Thus, he could incorporate the design with Islamic Principles. MCUID prototype is designed in Figure 2 applied desktop metaphor analogy. The Product interface includes the image of the Mosque as one of the Islamic identities and 11 spiritual-based culture icons such as Bismillah and Alhamdulillah.

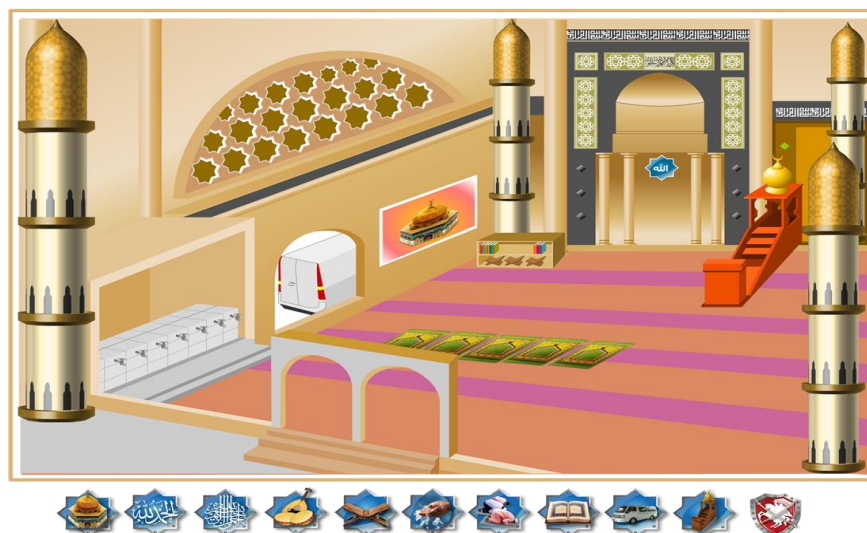


Figure 2. Muslim Centred User Interface Design (MCUID) Prototype

The symbol of the mosque is very synonym to the prayer. Prayer, the act of worship, is the second pillar of Islam. Prayer is obligatory and must be performed five times a day. Daily prayer is the best way to shape a

good personality. Prayer is for our immeasurable benefit and the blessings beyond imagination, and it serves as the concrete expression of thankfulness and appreciation to our Creator and Sustainer. Muslims should feel peace, tranquillity and self-fulfilment because the primary commandment of Allah has been performed. It gives hope that Allah will mercy his forgiveness. He is Most Forgiving (Q 39:53, 53:32).



Back in history, the Prophet Muhammad had built the Quba mosque as a symbol of faith in Allah. The mosque was made as soon as the Prophet reached Madinah’s periphery on his migration (*Hijrah*) journey. The prospering mosque is a sign of the piousness of a Muslim towards the Creator. Allah mentions this in At-Taubah (9:8): *For those who prosper the mosques, they are indeed people who surrender in faith to Allah and the hereafter.*

The mosque is also a symbol of education institutions, mental and physical development, gregariousness and nationalism of Muslims. There is no discrimination towards the personal and educational background, skin colour, race and language because Islam is meant for all human races. Today’s Muslim community must perceive further the significance of the mosque as an institution and initiate its prosperity. A mosque’s function is not solely for praying but inclusively for the veins and heartbeats of Muslims. Inspired by the spirit of the mosque, the study proposes the image of the mosque as a desktop metaphor analogy to represent good values in Islamic beliefs in the Muslim community. Thus, the design of the MCUID prototype mapped with the MCUID framework in terms of understanding the Islamic principles / Muslim culture.

Explanation on spiritual-based culture icon

Table 1 explained the concept of spiritually based icons that matched similar icons functions in Window 7 icons.

Table 1. Explanation on Spiritual Based Culture Icons

Spiritual based culture icon	Existing icon Window 7
 C3 Bismillahirrahmanirrahim	 E3 Start
Bismillah. كل أمر ذي بال لا يُبدأ فيه بـ"بسم الله الرحمن الرحيم" فهو أبتى". As the prophet (PBUH) said, “Every significant act in which Bismillah is not mentioned is cut off (from blessing).” (Al Khatiib al Baghdadi, kitab al Jaami’ li Akhlaakir Raawi: 2/69) 1. Al Quran begins with bismillah	The start icon is the central point for a computer program in performing other tasks. Bismillah is a phrase from the Al Quran that means “In the name of Allah”. As Muslims, we are encouraged to recite Bismillah before we perform any task to get blessing, strength, and

<p>2. Every verse start with bismillah</p> <p>3. Prophet begin writing a letter to a non-Muslim leader with bismillah</p> <p>4. Several examples from our prophet such as:</p> <p>a. Before eating, the prophet says to Umar bin Abi Salamah “say Bismillah “(Hadith sahih riwayat ibnu Majah: 4/406, no. 3265</p> <p>b. Before ablution, Prophet says: “do ablution with bismillah” (An Nasaa’I, Kitab Sunan: 1/61, no. 78)</p> <p>c. Before entering the toilet, Prophet says: “genie won’t be to see you in the toilet if you say bismillah”. (Tirmiziy, kitab sunan: 2/503, no. 606)</p> <p>d. Before you slaughter animal says بسم الله والله أكبر (Abu Dawuud, Kitab Sunan: 3/52, no. 2786</p> <p>Saying bismillah show humbleness and obedience towards Allah because He is the most powerful, loving and caring. This practice gives Muslims the strength to plan, estimate, and make decisions.</p>	<p>enthusiasm from Allah. In the same context, we apply this concept in the start icon.</p>
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Methodology

The method used surveys with closed card sorting. There are 26 participants, 13 students from Darul Quran (DQ) and 13 UiTM students involved in data gathering. The participants are 100% computer literate, 92.3% have computer experience, 73% have desktop experience with desktop, and 65% know metaphor concepts. Figure 3 shows a sample image of participants/ Muslim users involved in data gathering.





Figure 3. Participants in the Survey with Closed Card Sorting

Based on the MCUID framework, they are among Muslim Users’ Viewpoint at Filter 2. They are Muslim users who have already practised Islamic principles in their everyday lives; they could be familiar with the product

interface. Most importantly, they could visualise the mean values in the prototype. Muslims may come from many different races, and they practise Islam within their own culture, such as how they dress and eat. Even though they are different in cultures, Muslims must abide by the same Islamic principles.

Table 2. Two types of icons, Spiritual based culture icons and Window 7 icons

	Spiritual based culture icon		Icon based existing Window 7
C3	 Bismillahhirahmanirrahim	E3	 Start




Results

The Bismillah icon is chosen for results and findings as a sample of the product interface.

Perception Code C3 (Bismillah) with other code Window 7 icons-Quantitative

Table 3 shows the quantitative detail summary. Bismillah (C3), spiritual based culture icons that match with Window 7 icons are Start icon (E3), Off icon (E1), My Computer (E6), and Shut down (E4).

Table 3. Detail for Code C3 (Bismillah)

Spiritual based culture icon	Existing Window 7 icon	Number of participants
 C3- Bismillah	 E3- Start icon	17 (correct matching)
	 E1 – OFF icon	4 (wrong matching)


	 E6-My Computer icon	3 (wrong matching)
	E4-SHUT DOWN	2 (wrong matching)

Table 3 shows that 17 participants correctly match the icon Bismillah (C3) with the Start icon (E3). The majority of the participants/Muslim Users successfully recognise the insight meaning of Bismillah (C3) in metaphor analogy. The Product Interface (MCUID prototype) is considered a success if Muslim Designers' viewpoint match with Muslim User' viewpoint.

However, a few participants were still wrongly matching the icon Bismillah with the OFF icon, SHUT DOWN and My Computer icon. Wrongly matching the icon could be that the Bismillah icon is still new to the users and may perceive it differently.

Perception Code C3 (Bismillah) with Start icon (E3)- Qualitative

Through qualitative analysis, themes from 17 Muslim Users' perceptions for the code C3 were identified, as shown in Table 4.

Table 4. Perceptions for Matching C3 with E3

Participant number	Perceptions	Theme
P1	... as we read when starting site/ opening to the computer.	Start
P2	... because we should start everything with bismillah.	Start
P3	... because beginning work with bismillah.	Begin work
P5	... because it is the beginning of matter.	Beginning matter
P7	... but no comment from the participant.	-
P9	... since every time we start doing anything, we must read bismillah.	Start doing
P10	... because when we start doing something, start with bismillahirrahmanirrahim; thus, E3 is the best.	Start doing
P11	... because Bismillahirrahmanirrahim is said when we start to do anything, symbolise the startup.	Start do
P12	... because to start something, the first thing to do before doing anything.	Start something

P13	... because metaphor E3 means a start menu to begin the application. So, the metaphor C3 is very suitable for our works by saying “Bismillah”.	Begin work
P14	... because Bismillah is the starter of good things we want to do. It has the same concept as a startup.	Start good thing
P15	... because when we click start, it can make us remember Allah s.w.t.	Start to remember Allah
P17	... because bismillah. When we start something, we will begin with it. First of all, when we start up our pc, we will go to the start menu.	Start something
P19	... because whenever you want to start your application, start with Bismillah.	Start application
P21	... because metaphor C3 is suitable with E3 because ‘bismillah’ is the best word we must say when we begin something.	Begin something
P25	... because everything should start with bismillah.	Start everything
P26	... because every beginning starts with Allah’s name.	Every beginning

The perceptions from the Muslim Users are analysed using thematic analysis. Most of the themes show that icon Bismillah matches the Start icon as start or begin work. Understanding the power of Allah and the kindness of Him, the product interface (MCUID prototype) is hoped to educate users having the feeling of consciousness in remembering Allah during their interaction.

Conclusion

The significance of the study is the development of the MCUID framework and the MCUID prototype. The recognition test tabulates patterns of the perceptions on one of the product interfaces, which is Bismillah, as a spiritual-based culture icon. As a Muslim designer, being as a Khalifah of Allah, the niyyah to innovate the MCUID framework and prototype should be appreciated because those innovations could bring meaningful values to the Muslim users as faith reminders and educate them through technology.

The impact of the study emphasised that to invent a successful and meaningful product, a good understanding of the need is important between a designer and a user.

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Investigation of The Synthesis, Antioxidant, DNA Binding and DNA Cleavage Properties of Sodium 2-((2-hydroxy-5-methylphenylimino) methyl) benzenesulfonate


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Abstract: Sulfonate is known as a salt or ester of a sulfonic acid. It contains the sulfonate functional group R-SO₃. They are stable in water, non-oxidizing and colorless. The interaction of sodium-2-formylbenzenesulfonate with 2-amino-4-methyl-phenol produced 2-((2-hydroxy-5-methylphenylimino) methyl) benzenesulfonate in this investigation. Nuclear Magnetic Resonance spectroscopy (NMR), Fourier Transform Infrared (FTIR) Spectroscopy, Ultraviolet visible spectroscopy (UV-Vis) and Mass Spectroscopy (MS) techniques were used to identify the properties of the compound. The antimicrobial activity of the schiff base was tested using the Minimum Inhibitor Concentration (MIC) method. The reaction of the compound with for DNA were identified by DNA Cleavage and DNA Binding methods. The compound was observed to reaction electrostatically with Calf Thymus-DNA (CT-DNA) and further cleaved it hydrolytic and oxidative. The antioxidant activity of the synthesized base was examined using the 2,2-diphenyl-1-picrylhydrazyl (DPPH) technique. It has been determined that as the concentration of the chemical increases, so does its antioxidant activity.

Keywords: Sodium benzenesulfonate, Minimum Inhibitory Concentration, DNA cleavage, DPPH, Spectroscopy

Introduction

For the production of Schiff base and metal complex, hydroxy and phenoxy ligand are used (Shit et al. 2011). The synthesized Schiff bases are of great importance due to the groups they include (Barare et al. 2015). Schiff bases, which contain different groups, are used in many fields, from materials industry to biology (Piatek and Jurczak, 2002). In addition, Schiff bases can be synthesized according to the purpose. Bases synthesized for this purpose are used in many industries. Luminescence and catalysts are the main ones in these industries (Yam and Lo, 1999; Shepherd et al. 2010). Schiff bases have various biological activities due to their structure. These structures give them antimicrobial, anti-inflammatory, antituberculosis, antihypertensive, anesthetic, anticonvulsant and herbicidal properties. These structures become essential with these properties (Arjmand and Aziz, 2009; Dogan et al., 1997; Dhapalapur et al., 1968). Schiff bases are thought to exhibit antitumoral activity by inhibiting the biosynthesis of DNA damaging agents. Therefore, the interactions of Schiff bases with DNA should be investigated (Foye, 1995; Yin et al., 2012). Recently, Schiff bases have been used in calorimetric and fluorometric determination (Sharma et al. 2013).

The benzenesulfonate was used to product a new Schiff base in this study. Fourier Transform Infrared (FTIR) Spectroscopy, Nuclear Magnetic Resonance spectroscopy (NMR), Ultra violet visible spectroscopy (UV-Vis) techniques were used to characterize the synthesized Schiff base. The using broth microdilution assays, Minimum Inhibitory Concentration (MIC) of the synthesized base was detected against pathogenic cultures. The interactions of the compound with DNA were examined using UV-Visible spectroscopy and agarose gel electrophoresis. The DPPH (2,2-diphenyl-1-picrylhydrazyl) technique was used to determine the compound antioxidant activity.

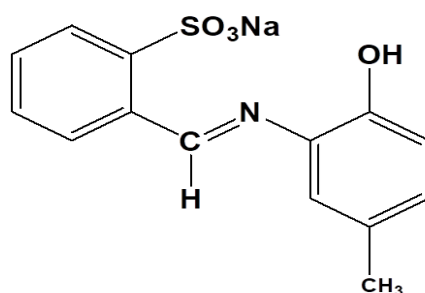


Figure 1. The chemical Formula of the Schiff Base

Material and Method

Materials

Plasmid DNA, Ethidium bromide (EtBr), calf thymus-DNA (CT-DNA), 2-amino-4-methyl phenol, sodium-2-formylbenzenesulfonate, DMSO (dimethyl sulfoxide) were procured from Sigma (Sigma- Aldrich, USA).

Apparatus

NMR spectroscopy were measured by the Advance 500 spectrometer (Bruker, USA). The absorption was measured with a BX II Spectrophotometer (PerkinElmer, USA). The ultra violet-visible spectrum of sample was measured by Shimadzu-1800 spectrometer (Shimadzu Corp., Japan). The elemental analysis was done with Vario El III Analyzer device. (Elementar, Germany). The melting point analysis of sample was carried out with the IA9100 Apparatus (ElectroThermal, UK).

Sodium 2-((2-hydroxy-5-methylphenylimino) methyl) benzenesulfonate

The sodium-2-formylbenzenesulfonate (0.450 g, 2,18 mM), produced from 2-amino-4-methylphenol (0.270 g, 2,18 mM) and EtOH (100 mL). The solution was stirred and evaporate during 1 hours. The compound was acquired after the solution was evaporated.

It was synthesized from chloroform (CHCl₃): n-hexane (3:2), m.p. 254-256°C, 0.57 g (%83) efficiency. Determined: C, 53.07; H, 3.83; N, 4.47. Calc. for C₁₄H₁₂NNaO₄S; C, 53.67; H, 3.86; N, 4.47. %. FT-IR : O-H; 3467, Ar-H; 3057, C=N; 1681, C=C; 1623-1562, C-N; 1504, C-O; 1385, O-S=O; 1233-1207-1134-1024. ¹H-NMR (400.1 MHz) δ 10.88 (s, ¹H, Ar-OH); 9.51 (s, ¹H, Ar-CH=N-); 8.64-6.15 (m, ⁷H, Ar-H); 2.38 (s, ³H, CH₃). ¹³C-NMR (100.6 MHz) δ: 194.14 (C-OH), 159.69 (C=N-H, 149.42, 148.71, 142.19, 138.83, 133.16, 139.36, 129.12, 128.41, 127.71, 127.06, 119.38, 117.14, 114.68, 20.80 (CH₃). The ¹H and ¹³C-NMR spectra were analyzed by Avance-500 Spectrometer (Bruker, USA). Fourier Transform Infrared Spectroscopy measurements were obtained with KBr disks and BX II Spectrometer. The spectroscopy results were given in cm⁻¹. The Vario EL III CHNS Elemental Analyzer was used for elementary analysis (Elementar, Germany).

Screening for Antimicrobial Activities

The antimicrobial activity of the sample was assess using the Minimum Inhibitor Concentration (MIC) method. The method used in the experiment was that of the Institute of Clinical and Laboratory Standards (CLSI, 2006). In this study using gram positive bacterias (*Bacillus subtilis* ATCC 6633, *Staphylococcus aureus* ATCC 25923, *Enterococcus faecalis* ATCC 29212, *Bacillus cereus* NRRL B-3711), gram negative bacterias (*Escherichia coli* ATCC 25922, *Escherichia coli* ATCC 35218, *Pseudomonas aeruginosa* ATCC 27853, *Proteus vulgaris* ATCC 13315) and yeast strains (*Candida tropicalis* ATCC 13803, *Candida albicans* ATCC 60193). The bacteria strains were incubated in Nutrient agar at 37°C for 24 hours and the RPMI-1640 were used to grow *C. albicans* and *C. tropicalis* at 25°C for 24 hours. The sample was prepared by dissolving in DMSO. The compound was diluted in Mueller Hinton Broth. As standards, gentamicin, ampicillin, and fluconazole were tested.

DNA Binding

The binding affinity of CT-DNA and the chemical was tested using the DNA binding technique. In this study using Tris-HCl / NaCl. The absorption of the CT-DNA solution give a information about the protein content of the DNA. The buffer of Tris-HCl/NaCl (3 mL) and compound (3 mL, 0.0000113 M) were added to quartz cuvettes. After, CT-DNA solution (5 μ L, 10 mM) was added to each one cuvettes as a blank. The cuvettes were incubated at room temperature for 5 minutes. Then, using a UV-Vis spectrophotometer, the absorption values were determined (Shimadzu Corp., Japan).

DNA Cleavage Studies

The obtained sample's DNA cleavage activity was determined using the gel electrophoresis technique. In this study using pBR322 supercoiled (SC) DNA (0.1 μ g/ μ L) in Tris-HCl (pH 7.4, 10 mM). Test sample was prepared at different concentrations. At 37°C, the sample and mixture were incubated during 3 hours. The sample was separated for 1 hour at 60 Voltage on a %0,8 agarose in Tris-buffer after incubation. Finally, gel bands were view with UV light (DNR Bio-Imaging System, Israel).

Antioxidant Activity

The method was used to as described by Blois (1958). Sample was prepared at different concentrations (20-40-80-100 μ g/mL). Sample was mixed with DPPH reagent. The solution was incubated at room temperature, dark condition and 30 minutes. At 517 nm, the absorption values were determined. The standard was BHT (butylated hydroxytoluene). Equation was used to calculate the scavenging activity.

$$\text{Scavenging Activity (\%)} = [(A_{\text{control}} - A_{\text{sample}})/A_{\text{control}}] \times 100$$

The absorbance of the control was A_{control} , the absorbance of the compound or standard was A_{sample} .

Results

Spectroscopic Studies

FT-IR, NMR Spectroscopy

Figure 2 shows the FT-IR spectrum of the synthesized base. There were vibrating bands of various. These bands were as respectively; 3467, 3057, 2968, 2910, 2863, 1681, 1623, 1562, 1504, 1385, 1233, 1207, 1134 and 1024 cm^{-1} . The band of 3467 cm^{-1} corresponds to C-OH, Ar-OH, while 3057 cm^{-1} corresponds to C-H, Ar-H, 2968-2910-2863 cm^{-1} corresponds to C-H, $\text{Csp}^3\text{-H}$, 1681 cm^{-1} corresponds to C=N, 1623-1562 cm^{-1} corresponds to C=C, 1504 cm^{-1} corresponds to C-N, 1385 cm^{-1} corresponds to C-O and 1233-1207-1134-1024 cm^{-1} corresponds to O-S=O. The presence of O-H in the compound is indicated by a stretching frequency of 2863 cm^{-1} .

The $^1\text{H-NMR}$ and $^{13}\text{C-NMR}$ results for synthesized chemical are shown (see Figure 3 and 4). The enol-imine tautomeric equilibrium in DMSO is confirmed by $^1\text{H-NMR}$ data (see Figure 3). Ar-H protons gave a multiplet for the compound at 8.64-6.15 ppm. At 10.88 and 9.51' ppm for the compound, OH and azomethine protons are detected. Methyl CH_3 , were found in the compound as a single at 2.38' ppm. The $^{13}\text{C-NMR}$ spectra show that the compound have 14 signals (see Figure 4).

For the Schiff base, the shift values are as respectively ; $\text{Ar}\underline{\text{C}}\text{-OH}$, $\text{-}\underline{\text{C}}\text{H}=\text{N}$, $\text{Ar-}\underline{\text{C}}$, and $\text{Ar-}\underline{\text{C}}\text{H}_3$. The carbons are observed at $\delta=$ 194.14 ($\text{Ar}\underline{\text{C}}\text{-OH}$), 159.69 ($\underline{\text{C}}=\text{N-H}$, 149.42, 148.71, 142.19, 138.83, 133.16, 139.36, 129.12, 128.41, 127.71, 127.06, 119.38, 117.14, 114.68, 20.80 ($\text{Ar}\underline{\text{C}}\text{H}_3$) ppm for the compound.

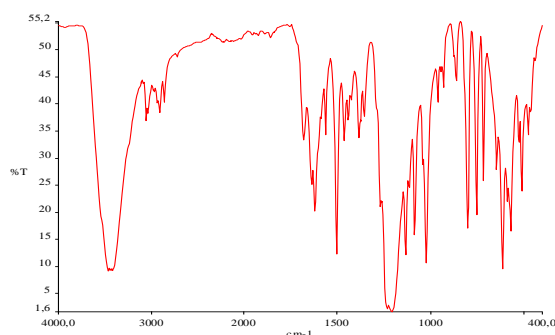


Figure 2: The Schiff Base's FT-IR Spectrum

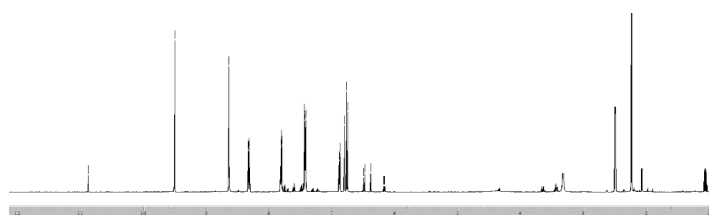


Figure 3. The Schiff base's $^1\text{H-NMR}$ Spectra

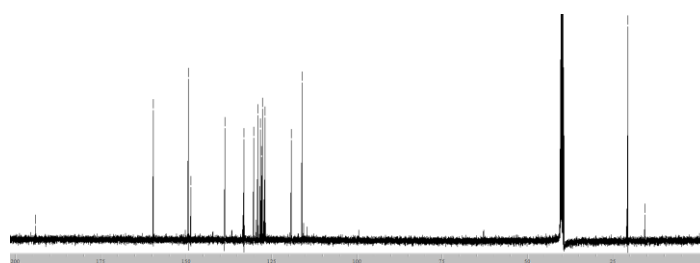


Figure 4. The Schiff Base's $^{13}\text{C-NMR}$ Spectra

Minimum Inhibitory Concentration (MIC)

The antimicrobial activity of the synthesized base was determined using broth microdilution assay. The MIC results of Schiff base differs depending on the strain. The reason for the different spectrum may be the cell wall

structure of the bacteria. It has been observed that Schiff base is antifungal (see Table 1). The highest effect has been observed against *C. tropicalis* (ATCC 13803); the lowest effect has been observed against *E. coli* (ATCC 35218), *P. vulgaris* (ATCC 13315) and *E. coli* (ATCC 25922) of gram negative bacterias.

Table 1. The MIC result of Schiff Base (µg/mL)

Microorganisms	Schiff Base	Gentamicin	Ampicillin	Fluconasol
<i>E. coli</i> (ATCC 35218)	256	0.13	32	-
<i>E. coli</i> (ATCC 25922)	256	0.13	16	-
<i>P. aeruginosa</i> (ATCC 254992)	64	0.06	2	-
<i>P. vulgaris</i> (ATCC 13315)	256	0.13	0.06	-
<i>S. aureus</i> (ATCC 25923)	128	1	0.06	-
<i>B. subtilis</i> (ATCC 6633)	128	0.06	0.06	-
<i>E. faecalis</i> (ATCC 29212)	128	0.5	1	-
<i>C. tropicalis</i> (ATCC 13803)	32	-	-	0.5
<i>C. albicans</i> (ATCC 60193)	64	-	-	0.0625

DNA Binding

The result show that absorption spectra of compound (see Figure 5). At 269 nm, an absorption band was detected. In the presence of CTDNA, the schiff base's absorption increased. In the spectra, there was a red shift (bathochromic; 1-2 nm.). The degree of redshift and hyperchromism are generally has been reported relation with the electrostatic binding. The sample's UV-vis spectra, 16-453% hyperchromic effect and 1-2 nm redshift were observed. The spectrum's hyperchromic effect indicates that the ligand an electrostatic interaction with DNA. The DNA is bound electrostatically by separating phenol protons from the acidic compound. This causes the charge distribution of the DNA chains to change. This causes to a disrupted of DNA.

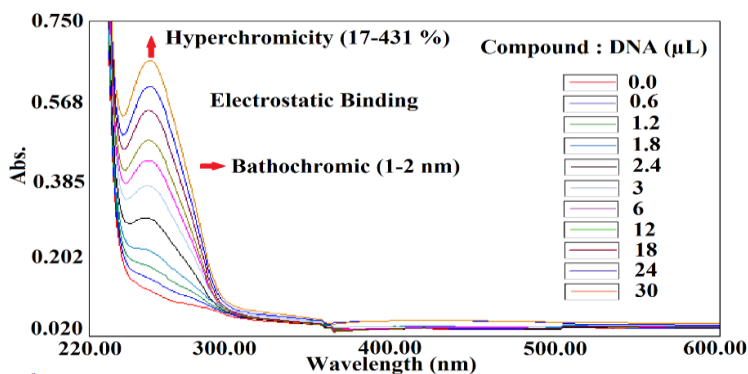


Figure 5. UV-Vis spectra of Compound

DNA Cleavage Studies

When the pBR322 plasmid is degraded, it becomes nicked (Form II) and linear (Form III). The supercoiled form (Form I) has fast migration than other form of DNA. Then it was seen that open circular (Form II), latest it was seen that linear (Form III) migration in the gel. The result show that the compound oxidatively cleaves pBR322 plasmid DNA (see Figure 6 (b)). Moreover, results show that the synthesized compound effectively cleaves plasmid DNA at 12.5 μ M.

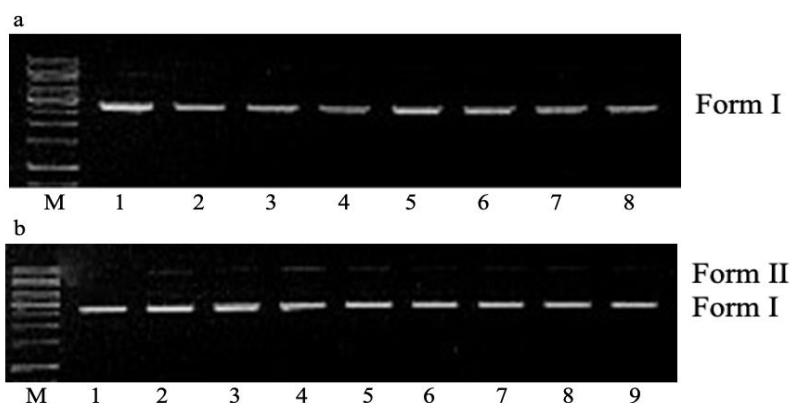


Figure 6. Cleavage of Supercoiled pBR322 DNA

a. Hydrolytic, M.Marker, 1. Plasmid DNA, 2. Plasmid DNA + 6.25 mM sample, 3. Plasmid DNA + 12.5 mM sample, 4. Plasmid DNA + 25 mM sample, 5. Plasmid DNA + 50 mM sample, 6. Plasmid DNA + 100 mM sample, 7. Plasmid DNA + 200 mM sample, 8. Plasmid DNA + 400 mM sample.

b. Oxidative, M.Marker, 1. Plasmid DNA, 2. Plasmid DNA + H₂O₂, 3. Plasmid DNA + 6.25 mM sample + H₂O₂, 4. Plasmid DNA + 12.5 mM sample + H₂O₂, 5. Plasmid DNA + 25 mM sample + H₂O₂, 6. Plasmid DNA + 50 mM sample + H₂O₂, 7. Plasmid DNA + 100 mM sample + H₂O₂, 8. Plasmid DNA + 200 mM sample + H₂O₂, 9. Plasmid DNA + 400 mM sample + H₂O₂.

Antioxidant Activity

Upon addition of compound, the color of the solution changes, and the DPPH chemical's absorbance at 517 nm reduced. The antioxidant activity result show that all concentrations of the compound 90% scavenging activity (see Figure 7). The activity appears to be independent of concentration. In addition, it was observed that compound was more active than BHT.

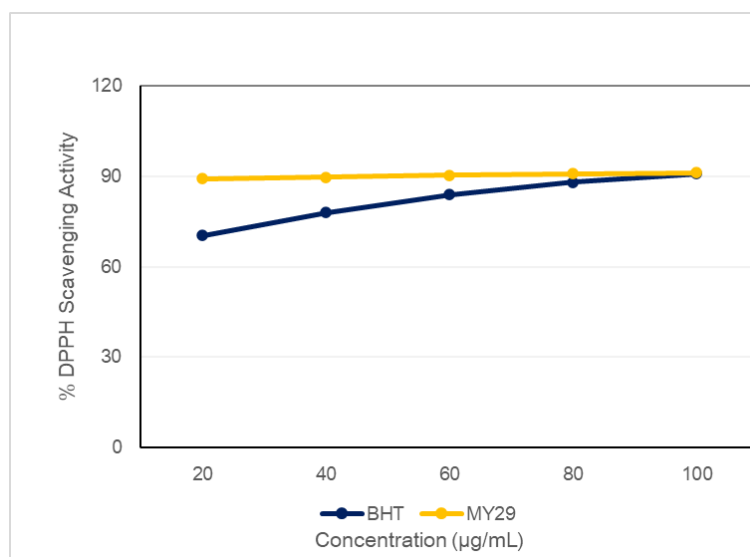


Figure 7. Antioxidant activity of Compound

In this present study, we have synthesizing Schiff base using sodium benzene sulfonate. Various ligands and groups can be used in the synthesis of the Schiff base. These bases can be used in a many industries, especially in the health industry. The antimicrobial effect of Schiff base varies depending on the microorganisms strain being tested. It is believed that schiff bases show antitumoral activity by inhibiting the biosynthesis of DNA damaging agents. Therefore, the interactions of schiff bases with DNA is a promising area of research. This study show that the possibility of use of schiff base and it's antimicrobial effect.

Conclusion

In this study, the compound was synthesized with sodium-2-formylbenzenesulfonate and 2-amino-4-methylphenol. The structure of the compound was examine using FT-IR, elemental analysis and NMR studies. The UV-Vis results showed that the compound may be used in DNA repair. The compound was able to cleave DNA, which was confirmed by gel electrophoresis studies. In addition; as compared to BHT, the compound's antioxidant activity is higher at low concentrations and remains stable as concentration increases.

Recommendations


We expect that the Schiff base sodium 2-((2-hydroxy-5-methylphenylimino)methyl)benzenesulfonate synthesis, MIC, DNA cleavage, DNA binding and antioxidant studies will be useful in the design and synthesis of novel compound.

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Antibiotic Resistance and Susceptibility to Genital Mycoplasmas (*Mycoplasma hominis* and *Ureaplasma urealyticum*)


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Abstract: Antibiotics can kill bacteria, but in some cases antibiotic resistance is observed, where bacteria develop and grow, in their presence. This is a very important problem today because antibiotic resistance is endangering the world by the growth of bacteria causing an increase in deaths. Antibiotic resistance can occur throughout the stated life, making it the biggest public health problem. Resistance to even one antibiotic can mean serious problems as infections that require the use of other treatments can harm patients by causing serious side effects, such as organ failure. Mycoplasma IES kits are a very effective solution in determining *Mycoplasma hominis* and *Ureaplasma urealyticum*. If the mycoplasma is sensitive to the antibiotic, the enzyme activity is inhibited, so there is no change in color. From their use in this study, it resulted that the most sensitive antibiotics which are used for the treatment of *Mycoplasma hominis* are: roxithromycina, clarythromycina, erythromycin. While for the treatment of *Ureaplasma urealyticum* are used: clindamycina, josamycina and pristamycina.

Keywords: Antibiotic Resistance, *Mycoplasma Hominis*, *Ureaplasma Urealyticum*, Roxithromycina, Clindamycina.

Introduction

The World Health Organization considers antibiotic resistance to be one of the greatest health threats because

infectious diseases that can be effectively treated are still a health problem today. Antibiotics are substance which used to treat or prevent some types of bacteria which causes infection. They kill bacteria or prevented them from their spreading (Bebear CM., *et al.*, 2000). They are not effective against viral infections.

In last years the big problem is the overuse of antibiotics, becoming less effective and has led to the emergence of “superbugs”. This is because some strains of bacteria have developed resistance to many different types of antibiotics. If some types of bacteria can be serious and challenging to treat, they should cause an increasing infection to relate with disability and death across the world (Jensen JS, *et al.*, 1991; Pheifer T., *et al.*, 1978). The biggest worry is that new strains of bacteria may emerge that cannot be treated by any existing antibiotics. Mycoplasmas and ureaplasmas are eubacteria classified in the Mollicutes class which are the smallest self-replicating organisms. Lack of cell wall makes these organisms insensitive to the activity of β -lactam antimicrobials (Martin Dh., 2015).

Mycoplasma hominis and *Ureaplasma urealyticum* are often isolated from the lower urogenital tract of healthy adults, females, and males. *Mycoplasma hominis* is usually found in men with non-chondrocyte urethritis that is not of chlamydial origin (Jensen JS., *et al.*, 1996; Zhang J., *et al.*, 1997). The normal male urogenital tract microbiota is found primarily within the distal urethra and includes bacterial species commonly associated with the skin microbiota. The normal microbiota of the female urogenital tract is located within one-third of the distal urethra and vagina (Jensen JS., 2006; Razin S., *et al.*, 1998). The normal vaginal microbiota is created immediately after birth and is a complex and dynamic population of bacteria that fluctuates in response to environmental changes. Vaginal microbiota organisms play an important role in nonspecific protection against vaginal infections as they produce lactic acid which provides an acidic environment (Amsel R., *et al.*, 1983).

In most women, lactic acid-producing bacteria in the vagina are dominated by a variety of *Lactobacillus* species, while in women who lack lactobacilli in their vagina, lactic acid production comes mainly from other types of bacteria such as *Leptotrichia* spp., *Megasphaera* spp., and *Atopobium vaginae* (Maher D. & Hoffman I. 1995; Martin Dh., 2015). *Lactobacillus* spp. uses glycogen from vaginal epithelial cells for metabolism and lactic acid production. This process is regulated by the hormone estrogen. Increased estrogen levels are associated with increased vaginal glycogen levels, increased lactic acid production, and a lower vaginal pH. Therefore, decreases in estrogen during the menstrual cycle and menopause are associated with decreases in vaginal glycogen and lactic acid levels and a higher pH (Viscardi RM., *et al.*, 2008). In addition to lactic acid production, *Lactobacillus* spp. also contribute to protection against infectious diseases through the production of hydrogen peroxide and bactericides.

Materials and Method

We have studied 80 cases, including 61 women and 19 men, presented in microbiological laboratories including Faculty of Natural Sciences laboratory. The *Mycoplasma* IES kit is designed for screening, indicative counting,

identification and testing for sensitivity to antibiotics *Ureaplasma urealyticum* and *Mycoplasma hominis*. Mycoplasma kit is based on culture and biochemical reactions. The ground is prepared by mixing lyophilized powder and diluent. Once mycoplasma has been cultured, urea can be degraded from urease to *Ureaplasma urealyticum* and released NH₃ (well no. 1 for identification and well no. 3 for count UU ≥ 10⁴), while arginine can be degraded from arginase to *Mycoplasma hominis* and released NH₃ (well no. 2 and well no. 4 for count UU ≥ 10⁴). NH₃ increases the pH of the liquid medium; the result is seen according to the color change of the indicator. If the mycoplasma is sensitive to the antibiotic, the enzyme activity is inhibited, so there is no change in color (Figure 1).



Figure 1. The Kit and the Susceptibility Result Paper

If the color changes from orange to red, this indicates the growth of Mycoplasma. If the color does not change, it may be considered negative or sensitive to antibiotics. The growing medium rarely takes on a light red color, so the color does not change significantly after being cultivated for 24 hours. In this case, it is recommended to extend the cultivation time by another 12-24 hours. Because the patient may have been infected with Mycoplasma recently, in the recovery period or under antibiotic treatment having a very small amount of Mycoplasma.

Suitable sampling for mycoplasma detection includes urethral tampon, urine, endocervical tampon, and endometrial biopsy. Calcium alginate, dacryon, or polyester pads with aluminum or plastic shafts are preferred. Wooden-axis cotton swabs should be avoided due to the potential inhibitory effect. Tampons should always be removed from samples before transport to the laboratory. If immediate transport to the laboratory is not possible, samples should be stored in the refrigerator for no more than 24 hours.

The species is susceptible when inhibited by both concentrations of antibiotics, is intermediate when inhibited by higher concentrations and not inhibited by lower concentrations, is resistant when inhibited by neither lower concentrations nor higher concentrations (see Table 1).

Table 1. Tests of Sensibility of Mycoplasmas

Wells	Antibiotics	Abbreviation	Percentage (mg/l)	
No. 6	Pristinamycin	PRI	2	
No. 7 & 8	Minocycline	MIN	2	8
No. 9 & 10	Josamycin	JOS	2	8
No. 11 & 12	Erythromycin	ERY	8	16
No. 13 & 14	Roxithromycin	ROX	1	4
No. 15 & 16	Clindamycin	DOX	0.25	0.5
No. 17 & 18	Ofloxacin	OFL	1	4
No. 19 & 20	Ciprofloxacin	CIP	1	2
No. 21 & 22	Clarithromycin	CLA	1	4
No. 23 & 24	Tetracycline	TET ^{UU}	1	2
No. 25 & 26	Levofloxacin	LEV ^{UU}	2	4
No. 27 & 28	Tetracycline	TET ^{MG}	4	8
No. 29 & 30	Levofloxacin	LEV ^{MG}	1	2

Results

Laboratory diagnosis of mycoplasma's infections is based on bacteriological tests including morphology, culture characteristics, physiological and serological properties. New tests based on molecular analysis of DNA, ribosomal RNA and cellular proteins are also being used to identify mycoplasma. Below, in Table 2 we present cases with *Ureaplasma urealyticum* and *Mycoplasma hominis*, which have shown sensitivity to different antibiotics.

Table 2. Antibiotics Susceptibility

Antibiotics	UU			MH		
	S	MS	R	S	MS	R
Clindamycin	30	15	3	9	17	2
Josamycin	17	7	24	4	0	24
Ofloxacin	8	0	40	5	0	23
Erythromycin	14	4	30	17	0	11
Tetracycline	20	8	20	6	14	8
Ciprofloxacin	11	0	37	5	0	23
Roxithromycin	15	16	17	19	3	10
Clarithromycin	21	8	19	18	0	10
Pristinamycin	17	0	31	15	0	9
Minocycline	4	0	44	1	0	27
Levofloxacin	13	3	32	12	0	13

In the study the group of antibiotics that is sensitive to UU includes: clindamycin in 30 individuals, nosamycin and pristamycin in 17 individuals. The antibiotic that is moderately sensitive is roxithromycin in 16 individuals, while the antibiotics that show resistance are minocycline in 44 individuals, ofloxacin in 40 individuals, ciprofloxacin in 37 individuals, and most recently erythromycin in 30 individuals (Figure 2).

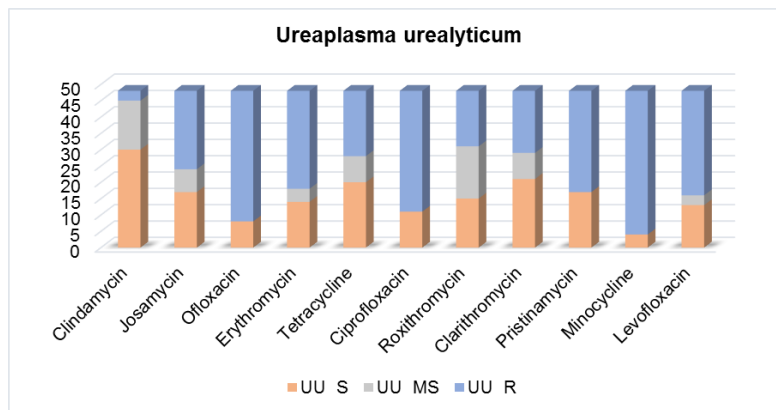


Figure 2. Antibiotic Susceptibility to *Ureaplasma urealyticum*

In our study for the treatment of MH infection in men and women the group of macrolide antibiotics showed higher sensitivity. 19 individuals have shown sensitivity to roxithromycin, 18 individuals have shown sensitivity to clarythromycin, 17 individuals have shown sensitivity to erythromycin and recently 15 individuals have been sensitive to pristinamycin. The group of antibiotics that were moderately sensitive included: clindamycin in 17 individuals and tetracycline in 14 individuals in the study. The group of antibiotics that showed the highest resistance in the individuals studied are: minocycline in 27 individuals, nosamycin in 24 individuals, ofloxacin and ciprofloxacin in 23 individuals (Figure 3).

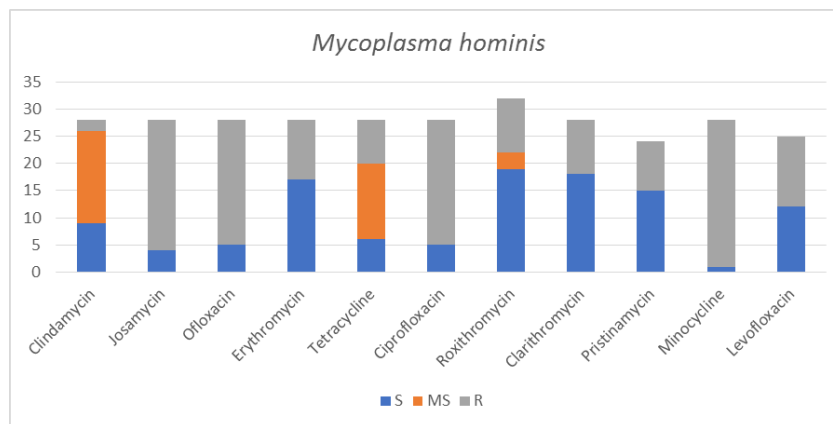


Figure 3. Antibiotic Susceptibility to *Mycoplasma hominis*

Discussion

Genital mycoplasmas has emerged as a Sexually Transmitted Diseases with a tendency to develop antimicrobial resistance, which has become increasingly challenging to treat. Due to the lack of cell wall, there are fewer classes of antimicrobial agents available which are effective against *Mycoplasma*'s species. The two modes that work against *Mycoplasma hominis* antimicrobial agents are: inhibit nucleic acid replication and inhibit protein synthesis.

In our study the group of antibiotics that is sensitive to UU includes: clindamycin, nosamycin and pristamycin, the antibiotic that is moderately sensitive is roxithromycin, while the antibiotics that show resistance are minocycline, ofloxacin, ciprofloxacin and erythromycin. Zheng *et al.*, 2021, have reported that the top group of antibiotics that was sensitive to UU includes were josamycin, minocycline and qianglimycin, the top antibiotics that show resistance were ofloxacin, levofloxacin and azithromycin. On the other hand Rahman *et al.*, 2016, have reported that antimicrobial sensitivity testing revealed that UU isolates were most sensitive to the tested quinolones (sparfloxacin, levofloxacin and gatifloxacin), this was followed by tetracyclines (doxycycline and minocycline).

In our study for the treatment of *Mycoplasma hominis* infection in men and women the group of macrolide antibiotics showed higher sensitivity. Where antibiotics that is sensitive to MH include roxithromycin, clarythromycin, erythromycin and pristinamycin. The group of antibiotics that have been moderately sensitive include clindamycin and tetracycline. The group of antibiotics that showed the highest resistance in the individuals studied were minocycline, nosamycin, ofloxacin and ciprofloxacin. Zheng *et al.*, 2021, have reported that the top group of antibiotics that was sensitive to MH includes doxycycline, minocycline, and josamycin; the top antibiotics that show resistance were clarithromycin, roxithromycin, and azithromycin. On the other hand Rahman *et al.*, 2016, have reported that antimicrobial sensitivity testing revealed that MH isolates were sensitive to the tested quinolones (sparfloxacin, levofloxacin and gatifloxacin), in addition to clindamycin and thiamphenicol.

Conclusions

Mycoplasma IES kits are a very effective solution in determining *Mycoplasma hominis* and *Ureaplasma urealyticum*. From their use in this study, it resulted that the most sensitive antibiotics which are used for the treatment of *Mycoplasma hominis* are: roxithromycin, clarythromycin, erythromycin. While for the treatment of *Ureaplasma urealyticum* are used: clindamycin, josamycin and pristamycin.

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Software and Hardware Problems That Teachers Experience When Using Smart Board

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Abstract: It is inevitable to use information technologies in education field as in every field. Public and private educational institutions have attempted to equip classes with these technologies. One of these technologies is smart boards. Smart boards are set up in the classrooms of public education institutions within the scope of the FATİH project and your teachers are available. There are advantages and disadvantages to using technology in education. For this reason, the question of what are the problems they face while teachers are using the opportunities offered by these technologies has always been a matter of curiosity. Therefore, the purpose of this research is to reveal the hardware and software problems on the smart board used within the scope of the FATİH project. As a research model, data was collected through a questionnaire by using survey research within the scope of quantitative research method. Considering the results of the research, limited internet connection, loss of time, problem with connection to other devices, inadequate technical support and educational materials have been identified as the main reported problems of some software.

Keywords: Smart Board, Interactive Board, Information Technologies, Smart Board Problems, FATİH Project, Smart Board Software and Hardware Problems

Introduction

With the development of technology, tools such as blackboard, chalk, and plugs used in classrooms have been replaced by more advanced digital technology-based devices. Boards, which are indispensable for classrooms, were also affected by this change and left their place to smart (interactive) boards. A smart board also known as interactive white board takes the whole thing you need in a whiteboard and mixes it with the excitement of a touchscreen to carry a teacher's classes to life. It is an interactive display in the layout of a whiteboard that reacts to person input both without delay or via different devices.

A smart board is a tool used via educators to venture and connect with their content, videos, interactive lessons, presentations, and different digital media. Also recognized as an interactive whiteboard, the floor itself is a contact screen usually with four pens to write on it. Using their software, teachers can create interactive lessons, combine video and other websites into the lesson as properly as manipulate the textual content on the screen.

Students can write on the board as properly to remedy problems, show evidence of an answer or whatever else the trainer would desire for.

As technological know-how continues to advance, so do the cutting-edge smart boards. When asking, how does a smart board work, most smart boards are comprised of a board that is plugged into electricity and typically a USB cord to plug into a laptop or computer. Then there is normally a projector element that may want to be installed to the ceiling or on an arm related to the smart board. Once the smart board is connected and recognized through the laptop or laptop and the picture is projected upon it, the instructor or the college students can now use the pens or their finger to write on the board, pick out something from a website, underline, spotlight or use something they could do on a touchscreen on the screen. The software program includes the multi-touch technological know-how that lets in up to 4 students to write on the display at the identical time. This allows them to clear up problems, work collectively to reply questions or take notes all together.

An interactive whiteboard, also known as a smartboard, it is an interactive display in the format of a whiteboard that reacts to user input either directly or through other devices. Smart boards can engage college students with the lesson. This can inspire college students to take notes and participate, and it can facilitate lively learning. Smart boards beautify cooperation and collaboration, making the classification fascinating and fun—all the greater reason why smart boards ought to be set up in each classroom. Students will brainstorm extra in team activities, resulting in fantastic problem-solving. Check out how teachers can interact with college students the usage of this technology.

FATIH Project

FATIH (The Movement to Increase Opportunities and Improve Technology) Project in education was launched in 2010 with the purpose of providing equal opportunities in education and improving the technology in schools using information technology.

“Informatics that can support education within the scope of FATIH Project in Education. It is aimed to deliver technology (IT) equipment to all schools, classrooms, teachers and students. In this context, it has been seen that the "Information Technology Classes", which were installed before, fulfill their duties adequately, but the fact that there is only one classroom equipped with IT equipment in our schools cannot fully meet the need. In this context, a need has arisen for every classroom to be equipped with smart boards so that all our teachers in the school can use IT equipment to support their lessons at the same time.” (MEB, 2017). When we look at the FATIH project expansion, it is the practice of using technology correctly by providing various opportunities for students to improve their study areas. FATIH Project, which is designed to provide the best education for each of our students, to reach the highest quality educational content and to provide equal opportunities in education, is the largest and most comprehensive education movement in the world regarding the use of technology in education.

Education Computing Network (EBA) is an online education platform created as a part of the FATİH project. The purpose of the platform is to integrate information technologies into education. EBA offers reliable and accurate e-contents suitable for grade levels and continues to be developed. The smart boards used in the FATİH project was created with the classical white board mounted on the rail system on top of the interactive board next to the classical white board. Smartboard used in FATİH project were described with different names in schools. These are interactive whiteboard, interactive whiteboard, smart board, electronic board or digital whiteboard.

Smart Boards in Education

Smart boards in education have many effects on using technology correctly and facilitating education and training. By using the smart board in their lessons, teachers provide permanent learning in education, make students love the lesson, use a visual interface and also offer various supportive software. The beneficial and harmful effects of educational use purposes have been examined in many studies.

It has been revealed that the effect of smart boards on student achievement and motivation is much more successful than the classical effect (Akar, 2020; Alanoglu & Karabatak, 2021; Bakare, Ariyo, & Ojo, 2021; Emre, Kaya, Özdemir, & Kaya, 2011). The smart board is an educational material that allows students to learn more easily the data appropriate for their age by enabling them to comprehend more easily, and collects the attention, interest and motivation of the students (Sakız, Aksu, Özden, & Şimşek, 2014). Teachers will use a computer, a projector, a special pen, or a finger as a touchscreen, and the smart board, which also acts as a normal board, will facilitate learning in education and offer rich content (Çelen, Çelik, & Seferoğlu, 2011; Gezgin & Mihci, 2020; Kaysi, Yavuz, & Aydemir, 2021; Serdar, Demirel, & Harmandar Demirel, 2022). It is seen that the smart board makes many contributions to education in terms of making the lesson more fun for both the teacher and the student, providing permanent learning, bringing together the factors that increase success, and attracting attention in a shorter time.

It has been revealed that students are more motivated in the lesson where they use the smart board, they come to the lesson prepared, and they participate more in that lesson (Smith, 2000). There are many benefits of the smart board to teachers. Some of these are making the lesson more effective, providing permanent learning to the student, presenting the visual and auditory perception, making the lesson fun by presenting examples from daily life. In the literature, it is similar to this study (Bilici, 2011). Although the smart board has many benefits, there are many hardware problems, internet infrastructure problems, problems due to power cuts, lack of materials, etc. in previous studies in the use of smart boards. There are many problems. It has been revealed that teachers do not experience any problems while using the lesson time, except for the problems caused by technical reasons (Türel, 2012). When we look at the source of technical problems, it is seen that the lack of technical infrastructure, the lack of knowledge and inadequacy of teachers about technology, and the smart board contribute to education by drawing a certain limitation (Türel, 2012). Although smart boards are developing day

by day, some problems regarding software and hardware continue.

These problems cause different problems from smart board to smart board. Because of the high sensitivity of the fixed-mounted smart boards on the wall, the cost is high and the repair costs are costly (Türel, 2012). Teachers are generally able to provide fast and freezing-free operations that they expect from smart boards. If this is not the case, the loss of time experienced until the device freezes and the program crashes as a result of switching on and off, or the loss of time for the processes to return to normal adversely affects the course. In addition, the effect of this situation on students distracts them, breaks their commitment to the lesson and creates a negative effect in the classroom. This leads to a waste of time to refocus the lesson. In another study that supports this, the effect of technical problems on students and teachers causes a decrease in motivation and distraction (Smith, Higgins, Wall, & Miller, 2005).

Teachers also have many problems with software. These include not being able to add animations, file extensions not opening, not providing enough content, etc. are problems. Teachers complain that they lose the air of the lesson in the classroom when they have difficulties and lose time while working on the smart board (eg, loss of time in opening and closing the smart board, freezing problems experienced in the system) (Çetinkaya & Keser, 2013).

Teachers think that with the content on the smart board, the lessons pass quickly, so permanent learning does not occur and the control of the lesson becomes difficult. In the studies carried out, problems arise in connecting smart boards with other devices, the screen resolution is insufficient compared to the size of the board, the storage units do not contain enough storage space, the temporary memory does not provide the desired performance, causing freezing and system failures, and power outages due to infrastructure technical problems observed in studies (Cetinkaya & Keser, 2013).

Method

The purpose of this research is it reveals the hardware and software problems while utilizing interactive board in the class in the scope of the FATİH project. Research questions of the study are as follows:

- What kind of software problems do teachers have with the smart board during the lesson?
- What kind of hardware problems do teachers have with the smart board during the lesson?
- Does the smart board provide sufficient support to teachers in terms of educational materials content?
- What are the most common problems or problems that teachers encounter when using smart boards?

A descriptive research model was conducted. In order to reveal the software and hardware problems experienced by the teachers in the research, it was deemed appropriate to use the survey research, which is included in the Quantitative Research, and a questionnaire was used to collect data in this study so that the data could be obtained from the source objectively. In order to collect the data, the teachers who will participate in

the study were informed about the subject to be researched. It was aimed to reveal the software and hardware problems experienced on the smart board by applying a 28-item Likert-type scale to the teachers as data collection.

A survey and data collection method were used to reveal the software and hardware problems experienced on the smart board. The survey consists of two parts. In the first part, the demographic characteristics of the participating teachers are included. In the second part, Likert type questions about software and hardware problems related to smart board are formed. While creating the survey questions, attention was paid to the findings obtained from the studies carried out in this field, taking into account the problems experienced on the smart board before. After submitting the final form of the questionnaire to experts in this field and the consultant of the study, some items were added and questions were removed and then put into practice. The Likert-type questions in the survey questions consist of 20 items and the grading of the form is “totally disagree (1)”, “disagree (2)”, “partially agree (3)”, “I agree (4)” and “I totally agree (5)”.

Results

100 teachers were participated to study 52 male teachers and 42 female teachers from different branches (see Table 1).

Table 1. Participants

Gender	Frequency (f)	Percent (%)
Male	52	52.0
Kadın	48	48.0
Subject		
IT	10	10.0
Turkish	10	10.0
Math	16	16.0
Science	12	12.0
Social Sciences	9	9.0
Music	3	3.0
English	18	18.0
Art	2	2.0
Physical education	3	3.0
Guidance	5	5.0
Religious & Ethics	7	7.0
Technology & Design	5	5.0

When the experience of the teachers is examined, it is seen that there are teachers who have teaching experience between 11-20 years. When we look at the overall research, it is seen that 42.0% are individuals who have been teaching for 10 years or more.

In order to collect the data, the teachers who will participate in the study were informed about the subject to be researched. It was aimed to reveal the software and hardware problems experienced on the smart board applying a 28-item Likert-type scale to the teachers as data collection. When the answers given by the Information Technologies teachers to the questions are examined, the software problems are frequently caused by the restrictions (internet, software, etc.) on the interactive boards that prevent effective use and the materials in the smart board are not suitable for the learning outcomes of my course. It is seen that he mostly gave the answer of “I totally agree” to his questions. According to the results of the survey, due to the fact that they are experienced in this subject, other branch teachers should also be qualified in certain basic trainings.

Table 2. Frequency Table of Problems

Gender	Hardware	Software	Admin
Male	42	45	15
Female	58	55	24

When the Table 2 is examined, it has been determined that men face fewer problems than women. It is seen in the table that women experience the most difficulties in the face of the problems they have experienced. It has been revealed by the data of the vast majority that there are no problems with the smart board support in general with the school administrators.

Table 3. Frequency Table of Problems based on Years of Service

Years of service	Hardware	Software	Admin
11-20	24	16	3
21-30	13	22	8

According to the results of the survey, it has been revealed that experienced teachers have less problems than teachers who have just started their profession. This shows that as the experience of the smart board increases, the probability of intervening against the encountered problems increases (see Table 3).

Table 4. Frequency Table of Age Experience Cross Tabulation

Gender	Hardware	Software	Admin
Male	32	38	35
Female	28	36	39

When the Phi coefficient test is applied, it is seen that the results are close to each other. Men show that they are older than women in hardware problems. Women are more likely to experience hardware problems at the age when they start working. Software problems were revealed as a result of testing, which showed close data for both. It has been revealed that men have problems at an early age compared to women in manager-related problems (see Table 4).

Table 5. t-Test Results comparing Males and Females on Software Problems

Gender	X	SS	t	F
Male	2.41	1.48	0.401	29
Female	2.25	1.41	0.402	27

Independent samples t-test revealed that female teachers experience more software problems than male teachers ($p < 0.05$) (see Table 5).

The frequency of survey was examined; it has been revealed that most of the teachers in the verbal department have connection problems with other technological devices. When the frequencies of calibration problems when using the interactive board are examined, it is seen that the values are close to each other. When the problem caused by the poor screen resolution is examined, it is seen that most of the teachers marked the option I totally disagree. This documents that improvements were seen in the smart board phase 2 study. It was seen that the failure to solve the technical service problems in a short time made many teachers aggrieved ($f=34$) and marked the option I totally agree.

Discussion & Conclusion

In this research, it has been prepared to determine the software and hardware problems experienced in the smart board and to present an improvement report. The data were collected by taking the opinions of the individuals teaching in primary education institutions through questionnaires. In terms of the reliability of the study, it was aimed to reveal the problems that the smart boards were installed and the teachers who used actively used it frequently. The validity of the questionnaire was taken into account by keeping male and female teachers close to the study on different branches at the same time. It is seen that detailed studies on this subject were taken into consideration after the phase 2 distribution process, in response to many problems experienced after the introduction of smart boards into our education and training lives. When we examine the three main headings and sub-questions on the hardware problems on the smart board, software problems on the smart board and the administrator support of the smart board in the questionnaire applied to the teachers, the problems that the teachers have experienced with the smart board have been revealed. In addition to the differences in some problems, when examined in general terms, the problems of teachers working in primary education institutions show a basic unity. The main reason for this seems to be that the problem causes another problem. For example, it was revealed that teachers could not reach sufficient material due to the limited use of the internet. When we look at the problems they have experienced in common, it is seen that the loss of time experienced in opening and closing the smart board, the connection problems of the smart board with other devices, the internet usage problems on the smart board, the lack of sufficient educational material on the smart board, and the delays caused by technical service support. It was obtained from the survey results that the teachers were undecided on some issues. It has been observed that they are undecided about the functionality of the handwriting recognition

feature and the smart board software. The reason for this is understood from the answers given to other items of the problems they have experienced with the smart board, and it has been seen that those who have problems with the hardware have a more positive view of the software problems. When the hardware problems on the smart board are compared with the other studies on this field, it has been seen that some problems continue and there are no improvement studies on this. In some hardware-related problems, different questions were preferred and the technical service units had problems in fulfilling their duties due to small details, so the teachers had to deprive the subject that they were going to cover in their lessons by depriving them of visual and auditory materials. This situation reveals the lack of permanent learning. As hardware, it is seen that the opening and closing time experienced in the phase 1 series smart boards continues with the phase 2 series. This result has also been reached in other studies (Çetinkaya & Keser, 2013; Türel, 2012). It is seen that this problem, which is experienced in other studies examined, continues. One of the other problems experienced is the connection problem with the peripheral units, the developing technology and the poor quality production of the connection point of the input and output units, as well as the unknowingly forcing and tampering with these areas by the teachers, causing some problems.

It has been observed that the software problems experienced in the smart board should decrease gradually, and the needs opened with the developing technology could not be met. Many of their teachers complained about not being able to access sufficient material due to internet restrictions and lack of educational materials. In the studies conducted (Çetinkaya & Keser, 2013; Emre, Kaya, Özdemir & Kaya, 2011; Türel, 2012), data supporting the result were found. It is seen that a situation that creates a problem brings another problem along with it. When the data I obtained with the previous studies are compared, it has been seen that some problems in setting the toolbox and calibration have been eliminated to some extent. In this context, within the scope of the FATİH Project, a study should be carried out to increase the number of common areas that teachers can use instead of internet restrictions and to open useful sites to users. Unlike similar studies, when we examined the teachers' thoughts on preparing materials on the smart board and the problems they experienced, it was determined that the teachers themselves could not prepare the material and only used it as a presentation tool.

It is perceived only as a reflective visual and auditory device, especially for verbal lessons. It has been determined that Information Technologies teachers are more conscious and have less problems in serving the purpose of the interactive whiteboard in this regard. It is seen that the biggest problem of teachers is the internet restrictions that they have problems in finding and preparing materials.

In the survey questions made in order to reflect the opinions of school administrators with the smart board to the teachers, it was seen that the administrators were open to and supported the new technology to a large extent. It has been observed that they tend to help teachers about the subjects they need. These results show that technological developments in schools are better than in the past or that they are warm to new teaching technologies. When examined in general, improvements were seen according to the studies on this subject, where improvements were made according to the phase 1 series of smart boards. The effective use of the smart board helps to solve and reduce the problems if the R&D employees pay attention to the work done on these issues in order to identify the frequently experienced problems and to provide the necessary support.

Recommendations

According to the result of the study the following recommendations can be made to both teachers, administrator and policy makers:

1. Teachers about the smart board should be informed about the actions to be taken in case of simple hardware and software problems.
2. By controlling the smart boards with the remote opening module, efforts should be made to reduce unnecessary time loss and increase the processing capacity of hardware devices.
3. The R&D department dealing with smart board problems should be developed and brought to a structure that will produce solutions in a short time.
4. Internet restrictions should be reviewed and useful sites should be opened.
5. In addition to the user manuals, a simple intervention booklet should be produced against the problems experienced.
6. By increasing the storage capacity inside the smart board, the materials should be sifted through with the annual update.
7. It should be integrated into the smart board software by making applications similar to the EBA system, where teachers can obtain materials.
8. When the teacher tries to open the work he has prepared at home on the smart board, checks should be carried out at regular intervals so that he does not encounter the version and update problems he encounters.
9. The seminars given to the teachers are not one-off, but the innovations of the developing technology should be conveyed and training should be given at regular intervals in order to use them more effectively.
10. A remote intervention team should be established with an online network connection where teachers can get help in case of problems.
11. A solution should be provided in a short time by having technical service personnel in schools only for this purpose.
12. The problems experienced by the schools should be listened to, and improvement efforts should be increased by forming a whole.

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Edutourism Augmented Reality Mobile Application for Forest Conservation

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Abstract: Educational tourism or edutourism is the economic sector that is developing fast and is acquiring more popularity nowadays. Edutourism can be scoped into various categories, including edutourism inside a National Park. As Malaysia is actively promoting ecotourism, it is highly relevant to infuse the edutourism element in it. Hence, it allows for the preservation of knowledge for the generation to come without neglecting the need for ecological sustenance. Edutourism is a combination of the two powerful industries of education and tourism, which create a super-industry that can positively enrich the lives of all involved. Forest-based educational tourism is one of the potential ways for diversifying people's education. Educational tourism is delivered through an educational program and seeks to change learners' cognitive, participatory knowledge, skills, and behavior. Through educational tourism, the visitors travel to a location engaging learning experience directly related to tourism. This tourism is a component of lifelong human education. The main target of forest-based educational tourism is to ensure understanding and gather knowledge regarding forest conservation while fulfilling the educational requirements. This project proposed the usage of Augmented Reality (AR) technology in cataloging significant trees that served as landmarks of the Malaysia National Park and provided detailed explanations about the selected trees in the catalog, such as the benefits of the trees, the usage, and characteristics of the trees. Visitors can then visit the area and learn about the trees using AR imagery projected on the device. This project aims to establish cataloging and produce an AR application to create a 3D model on

the detected image. This study used Unity and AR Foundation framework as tools to develop the application. Challenges of this project are the phone requirement, the limited AR user interface, and the non-availability of communication signal will be addressed in this project.

Keywords: Edutourism, Augmented Reality, Forest Conservation, Unity, AR Foundation

Introduction

Education tourism or edutourism is beneficial in many ways for society at large. Undoubtedly, education tourism is a tool for providing development from the grassroots of any region, state, and country. It is a medium through which the tourist destinations will get an identity on the global level. Education tourism is a niche to explore the hidden treasures of a place (Stoyanova-Bozhkova, 2020). Edutourism is a combination of the two powerful industries of education and tourism, which create a super-industry that can positively enrich the lives of all involved. Edutourism represents 20% of global tourism and is expected to double its growth by 2020 (Ohe, 2017). Educational tourism goes beyond simple curiosity, interest, or attraction for a particular subject. It includes a travel experience in which there is organized learning, either formal or experiential learning. The educational journey can serve many purposes, such as the satisfaction of curiosity for other people, their language, and culture. Moreover, it stimulates interest in music, art, architecture, or tradition, to be sensitized to the natural environment, landscapes, flora, and fauna, and to enhance the interest in cultural heritage and historical sites (Ritchie et al, 2006).

Forest-based educational tourism is one of the potential ways for diversifying people's education. Large international organizations such as World Wildlife Fund and The Nature Conservancy have emphasized this learning system. Educational tourism is delivered through an educational program and seeks to change learners' cognitive, participatory knowledge, skills, and behavior. Through educational tourism, the visitors travel to a location engaging learning experience directly related to tourism. This tourism is a component of lifelong human education. Again, forest conservation is also a valuable part of the education system. Geological aspects, biodiversity, wildlife, mangroves, reef, food circle, ecology are included in the natural conservation of the forest areas. It gives us a whole idea about forest diversity, as well as biological, environmental aspects. So, the main target of forest-based educational tourism is to ensure understanding and gather experience regarding forest conservation while fulfilling the academic requirements (Bhuiyan et al, 2010).

Educational tourism may become a major educational paradigm shortly, creating added value in the society, both by increasing the education level and creating new economic opportunities due to gained knowledge due to traveling. Researchers believe that organizations need to find new ways of adding value by enriching tourist experiences to remain competitive (Scarles et al, 2016). The ability of Augmented Reality to overlay information about the real environment has made it a popular tool for enhancing the tourist experience. Tourism organizations' pressure to adopt modern technologies, such as Augmented Reality, has reached the point where

it is now considered necessary (Jung et al, 2014). According to Hincapié et al. (2021), augmented reality can improve education and interpretation as it will tailor the information to the tourist specifically to their preferences, creating a different custom experience between every tourist (Kounavis et al., 2012) and thus will increase interactivity engagement (Jung & Tom, 2017).

Mobile Augmented Reality will boost the experience while touring by giving them the experiences they can't get in the real world. Tourism can take advantage of this particular set of technology. Garcia-Crespo et al. (2009) mention that tourism is an industry that is in dire need of a new technology revolution that is highly dynamic, interactive, and entertaining technology-based integrated value-added services.

This project proposed using augmented reality technology in cataloging significant trees that served as landmarks of the Malaysia National Park. Visitors can then visit the area and learn about the trees using augmented reality imagery projected on the devices. Some tourists seek active, personal learning by observing the objects and as outlets for physical and mental relaxation and escapism (Combs, 2010). Active learning can be looked at as a form of edutourism. If a prospective tourist finds that touring in one place is the same as traveling at another location, one with a lower attraction value will likely slow the growth of incoming tourists (Ojo et al., 2019). The problem can be solved by having an application where the tourists can select the information within their interest to know more and identify the artifacts around them, giving them an added value and experience via mobile augmented reality (Kounavis et al., 2012). Furthermore, as artificial artifacts can impact the ecosystem, the application can be developed using non-intrusive technology such as GPS. The only challenge will be the non-availability of communication signals, cloud storage requirement, and augmented reality user interface design addressed in the project. This study aims to provide the user with knowledge about the selected endangered tree such as Tualang, Mengkuang, and Mengkudu. The researcher develops an AR application to detect and produce a 3D model on the detected image in this study.

Augmented Reality is the technology that able the user enters the entertainment in their mobile phone. Augmented reality has become trending because the number of users using this technology is increasing day by day. Pokemon GO is one of the examples of a successful application that used AR. AR allows users to experience with an enhanced view, the environment with digital content such as 3D video player, 3D model, and animation graphics model. the purpose builds the AR application also to stimulate the human sensory system. One of the important requirements for making the AR application is recognizing the user's real environment to fit two different worlds: the digital world and the real world. The AR application must accomplish these requirements: real-time birth registration and semantic contact within the real world.

Dirin and Laine (2018) state that Augmented Reality is the computer modeling that enables the user to interact with a 3D object with animations or stimulate the sensory environment. The difference between AR and VR is AR has a better sense of reality and better interaction. However, VR only gives the users an immersed feel of the digital world (see Van Ginkel et al., 2019). In conclusion, AR technology performs well to enhance real-life while VR takes the user into the digital world. Whereas Chai et al. (2003) state that VR and AR have become

trending for training the healthcare staff. Some researchers also reported that the visualization from the VR might produce scattered radiation; AR and projection mapping helps the team to increase their awareness in the medical area. It is also an efficient tool for them to practice what they have learned during their studies.

There are a few challenges and limitations of AR technology that are still uncovered (Bhutta et al. (2015). These challenges are the component for AR development that is required for both, which are hardware and software. The hardware can be divided into six. One of these examples is a smartphone. The software can be divided into app or programming that run locally or cloud. El Zayat et al. (2012) created a scheme of augmented reality components from the real to digital. Their application consists of a real scene, a web server, and AR Scene. The AR application uses 3D objects, 2D images, and animations to develop AR applications.

According to Yu et al., (2016), many technologies develop an AR application. Some of them are image tracking, object detection, calibration, and model rendering. There are many fields in which AR is being used in the current era, and it is still in progress, increasingly being used by other areas. One of the biggest reasons for increasing mobile gadgets is Augmented reality. Here the researcher comes out with a review of why AR influence the increasing number of a mobile device in society.

Augmented Reality also has been used in many areas for educational purposes. Kamphius et al. (2014) found that by using this way, learning through Augmented Reality is more fun, clear manner and efficient, and easy to memorize to remember all the information. In the Educational Augmented Reality application, students will learn and have entertainment through 3D objects in which they can see things in the real world through mobile phones. For example, medical students use AR applications to learn how to operate through mobile phones without taking a risk on humans in the real world. This allows them to learn more efficiently because they have to adapt to the culture when operating in the hospital. Table 1 below shows the example of AR applications that have been applied in this era.

Table 1. AR Applications

Area	Potential Implementation.
Gaming	The most popular AR application These are received the highest recorded and have the potential for the entertainment area (Chatzopoulos et al., 2017)
Navigation	Enable the user to interact with the 3D object with the world through a mobile phone. (Chung et al., 2016)
Tourism	Interesting way to learn about the benefits, history, and politics applied in museums, forests, and exhibitions. (El Zayat et al., 2012)

Methodology

In this subtopic, the researcher conducted different methods to develop AR applications. The researcher also has reviewed the usage of AR applications in the real world from the literature review. In a study by Akçayır & Akçayır (2017, the author explains the strategy of learning something in education: formal way, informal way, and job training. The author found that the type of apprentices in the researcher, the most used AR, the advantage of AR in educational area and challenges of AR in an academic area. They state no clear explanation about the side effect of using AR technology in the educational space. They concluded that mostly when the developer develops AR applications, they consider which multimedia element should be implemented in the application, such as Text, Video, and sound. They did not analyze how the multimedia element will affect the effectiveness of the application. The proposed methodology must fulfill the requirement to achieve the goal. The development of this researcher adapts the Software Development Life Cycle. The researcher uses this method to help the developer develop the application and ensure the product can be done quickly but with great functionality. The purpose of choosing this method is to ensure that the project delivered will enhance the cultural experiences that the user will perceive by using AR technology. It consists of four phases in RAD methodology: Requirement Phase, User Interface Design Phase, Construction Phase, and Cutover Phase. The figure below shows the application architecture in this study.

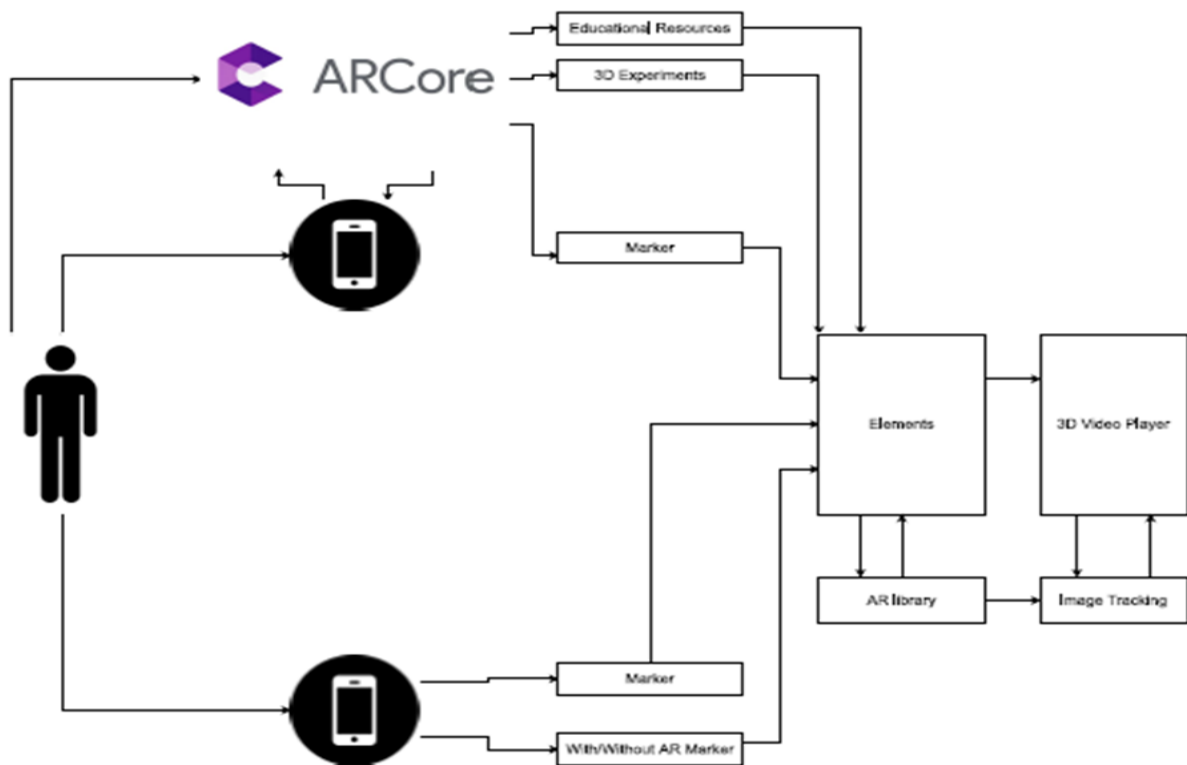


Figure 1. Application Architecture

Figure 1 illustrates the application architecture in this study. The application hovers the camera and captures the image through the camera. Using AR Core technology, the idea is preprocessed to different sizes of width and height of the photos to make sure it transports the feature correctly and tracks the image properly. The AR Core technology enables the researcher to implement image tracking and detect the image directly without involving AI technology. This technology will analyze the image through a tracker script, identify the image, and produce the correct 3D model on the detected image composed of the target.

Once the image is detected and identified, the application will render the 3D model, then verify the target's status by the tracking library. This can be done by writing the script and updating the logic programming on Unity. Finally, it will produce the graphics of the 3D model, which is a 3D video model on smartphone devices. The next section explains the detail the methodology of this research.

Requirement Stage

During this stage of the RAD model, the researcher carried out several studies to find the deliverables state. This step is crucial that everyone can assess and weigh in the project's objective and expectations. The researcher can avoid all the miss-understanding on how to develop the AR application and the information about the forest. This stage considers the important part before starting the development because it will reduce the time of the product and help the researcher make decisions accurately. After finish, this stage, the researcher documented all the literature had been reviewed and proceeded to the next stage

Table 2. Requirement Stage

Phase	Activities	Deliverables
Requirement Stage	Literature review	Application Requirement
	Analyze current technology	Information for the application
	Technology comparison	Objective
	Analyze pricing of current technologies	
	Interview	

Design Phase

After collecting the information from the literature review, the research designs the application using a cloud platform which is Draw.io. The research draws the application process, the architecture of the application, and the application's design in this platform. This stage will help the researcher to develop the AR application. The researcher has a plan of what the element needs to use and implement in the application.

In this study, the research applies the multimedia elements in the application: object, button, image, and video. The researcher also has designed the functionality of the application. After finishing this stage, the researcher documented the application's design to reference the next step.

Table 3. Design Phase

Phase	Activities	Deliverable
Design Phase	Design the user interface	Mobile Augmented Reality
	Design the functionality of a 3D video player	User Interface design
	Design the user interface of the video player	3D video player design Button functionality design

Development Phase

In this section, the researcher explains the development in this study; the researcher uses tools and frameworks to develop the application. These tools and frameworks are Unity, AR Core, AR foundation, Unity library package, and AR foundation image tracking package. The researcher develops the application using the design from the previous stage. This helps the researcher identify what elements and functionality should be included and the process will be faster since the researcher has the design for the product.

At the end of the development of the application, the researcher is required to make sure the application is a free error and able to deploy to the application. In this study, the researcher design and created a catalog for the application, and the application was trained so that it is only able to use this catalog to see the AR.

Table 4. Testing Phase

Phase	Activities	Deliverable
Testing	Application testing	The AR application with full functionality of multimedia elements in a 3D model.
	Deploy the application	
	Develop the application	

Figure 2 shows the sample catalog for this study. The user is only able to use this catalog to produce an AR model because the application has been programmed that only the picture in the catalog can produce an AR model. After finishing the development process, the researcher documented all the development material and will be used next.

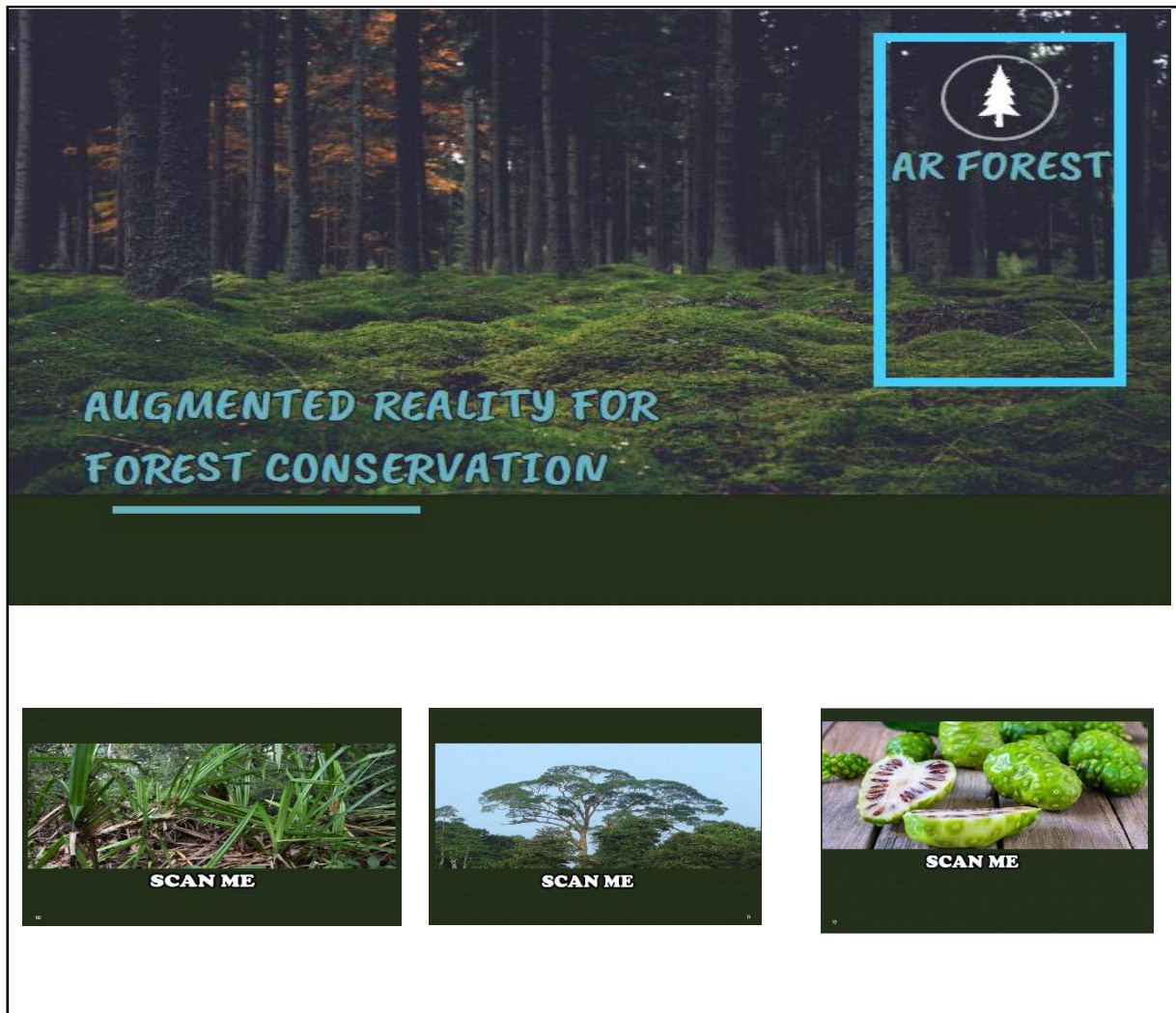


Figure 2. Sample Catalog for the Application to Produce AR Model

Testing Phase

In this section, the researcher explains in detail the process involved in the testing phase. The sample or beta application should be ready to use on the mobile phone during the testing phase. This allows the researcher to test the application whether the application produces a bug or produces a logic error. If the researcher finds out that the application has a bug, the researcher requires maintaining and fixing the bug in the application. This process might take some time because the researcher needs to consider many factors. One of them is that the researcher needs to re-code if the 3D model does not produce the detected image.


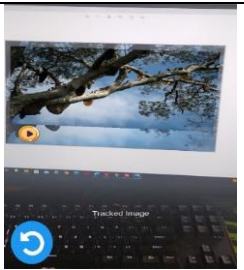

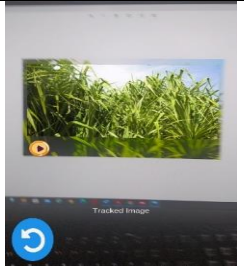

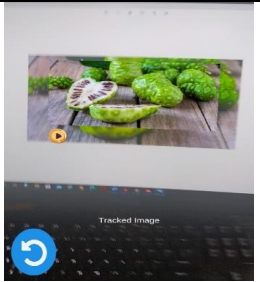
Table 5. Development Phase

Phase	Activities	Deliverable
Development phase	Application testing Fixing the bugs Validate the application	The AR application is free from bugs and errors.

Results

In this section, the researcher explains the outcome of the development. The researcher has built the functionality, user interface, and AR functionality to develop the application to produce a 3D model on the detected image. There are three classes to see the image, which are Tualang, Mengkuang, and Mengkudu trees. The researcher used the image from google image due to the pandemic but later on, if there is permission to enter the National Park, then the real image will be used. This application has only one activity which is the AR image tracking activity. In this activity, the user must hover the phone camera on the image; then, the application will produce the 3D model on the image if the idea is the same as in the database. This application has four functionality which is the play button, pause button, reset button, and stop button. If the application has produced the model, the user should see the 3D video player. The user can interact with the 3D model in which they play the video, pause the video, stop the video and reset the AR session if the application seems to miscue function during the detection.

Table 6. Forest Conservation Scene

Class	Image	Output
Tualang		
Mengkuang		
Mengkudu		

Discussion

Table 6 shows that the forest conservation scene that has been implemented with AR technology. Once the user opens the application, the user should directly see the activity to detect the image. Then, the user needs to hover the camera phone to the image to produce the 3D model. Then, the user should see the outcome, as illustrated in table 6 above. This application allows the user to interact with the 3D button.

Once the user clicks the play button, the play button will become invisible, and the pause and stop buttons will become visible. Then when the user clicks the pause button, the pause and stop button will become invisible, and the play button will be visible. When the application is in a paused state, the user can resume the video after clicking the play button. The same goes for to stop button; once the user clicks the stop button, the stop and pause button becomes invisible, and the play button becomes visible. Once the stop button is clicked, the user will need to watch the video from the start. This application aims to make the user appreciate and give knowledge to the user about the tree that might become rare in this era.

Conclusion

This project is to develop an application that can detect and track the image. This report explained in detail how the researcher developed the application. This application adapts the software development life cycle. The researcher developed the application using the library package provided by unity which is the AR foundation. The image that should be able to be tracked is Tualang, Mengkuang, and Mengkudu trees. AR Foundation also provides a lot of other features such as Plane Detection, World Tracking, etc. Using this application should provide users with information about these trees, which are Tualang, Mengkuang, and Mengkudu. As in tourism, the importance of consumer experience is explained by its contribution to adding value for tourists and improving their satisfaction level.

Hence, integrating tourism with mobile augmented reality will give tourists added value by enhancing their experiences while touring without any additional tools or requiring them to have a tour guide to experience the tours fully. It is recommended to implement more functionality such as navigation, adding more classes, more buttons, and adding robot assistants to the application. This allows to user to experience by itself without any assistance from anyone.

Also, it helps the user to understand the application and to appreciate the importance of the tree that is getting extinct. Mobile augmented reality in the tourism sector will create a new type of tourism. It will unlock various possibilities in the tourism sector, such as interactive tourism, game-based tourism, focused-based tourism, and much more. Using such technology-enhanced learning environments is a necessity for transformation of education (Latifi & Noroozi, 2021; Latifi et al., 2020, 2021; Noroozi 2018, 2022; Noroozi et al., 2016; 2020; Noroozi, O. & Sahin, 2022a, 2022b).

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Grotesque Approaches in Ceramic Applications: The Case of Gauguin

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Abstract: Along with many post-impressionist artists such as Van Gogh, Cézanne, Gauguin was responsible for changing the artist's role in Western society. The artist's personal suffering, grief and isolation were seen as a necessary process to achieve artistic satisfaction. This evolution of the role of the artist, which has continued until today, still affects societies and maintains its importance. Gauguin explains that today's free artists should be grateful for the courageous initiatives of artists who have faced many criticisms in the past, by saying, "The public owes me nothing because my work is relatively good, but today's painters who enjoy this freedom certainly owe me something (Barnes, 1992, p:8)". Born in Paris in 1848, Paul Gauguin left his modern life behind in his personal adventure that he started for artistic pursuits and mingled with the natives of the South Pacific. The theme of his works is often the representation of this new lifestyle he experiences. These works, together with the symbolic expressions of the artist, highlight the harmony between nature and humans. At the same time, the primitive lifestyle led to the reshaping of Gauguin's feelings (Aldoğan, 2019, p:31). In this study, the use of the expression "grotesque", which is an ancient concept in ceramic art, in the form of an art style is tried to be explained by taking the works produced by Paul Gauguin in the last half of the 19th century as an example.

Keywords: Grotesc Approaches, Ceramic, Art.

Introduction

There are opinions that Gauguin had a more advanced worldview and art style compared to other artists of his period. Gauguin's art production style and artistic view allowed him to be excluded in certain periods and to glorify him in later times. The artist's different perspective on art, and the way he experiences and handles art also show us how he sees and interprets himself as an individual and the world at the same time. It is seen that Gauguin exalts himself in many of his works and reflects an artistic arrogance.

Although born in 1848, Gauguin began to be known as a serious painter only when he reached his thirties.

Although he did not receive an academic education, he worked with Camille Pissarro in 1879, adopted the impressionist style and developed rapidly in artistic terms by using this style efficiently. Living in Martinique in 1887 led him towards his mature decorative style, but he made the greatest progress between 1888 and 1890 in the small towns of Pont-Aven and le Pouldu in Brittany. It can be said that what pushes the artist from France to experience the lifestyles in these primitive towns is that he finds the French society of the period unnecessary and too civilized.

When Gauguin began his first trip to Tahiti, he hoped to paint more freely in a primitive culture. Because he defended the idea that the materialist bourgeois society, which he despised, dominates the entire contemporary European culture (Alloway, 1996, p:9). The break from civilization to the primitive allowed Gauguin to reach artistic heights and freely describe the emotions and experiences of primitive life and uncivilization in his works. When the artworks are examined, this change process can be observed in the context of colour in comparisons between France and Tahiti. Even in all the difficulties, he experienced materially and spiritually, the artist reflected on his every experience with art and continued to produce works. This situation can be said to be an indication of the artist's love and belief in art under all circumstances. During his time in Tahiti, the artist was not only inspired by the culture and life of the local people but also included his interest in Egyptian art in his works.

At the same time, Gauguin did not take a place like a wanderer among these primitive communities he mingled with, he learned their religion, worshipped the statues representing the gods they believed in like them, and tried to fulfil the necessary elements in order to live as one of them by participating in their religious rituals. He later used these religious rituals in his artworks. In this context, he did not completely break away from western culture but synthesized Tahitian figures with the motifs and mise-en-scènes of western religion as if they were elements of western culture and thus created visual stories.

Grotesque elements are frequently encountered in artistic objects seen in primitive civilizations. Primitive effects and grotesque elements are also seen in Gauguin's works shaped by his journey. In fact, although the concept of the grotesque covers the history of humanity from a long time ago, its emergence as a concept was later. The association of the concept with art has occurred in a more recent period. According to Connelly, it has not been possible to define the grotesque visual arts as a concept since the early nineteenth century. The Romantic era associated the grotesque with modern expression as a means of exploring alternative experiences and different modes of expression and challenging the assumed universals of classical beauty. Following all this, the modern age has witnessed an explosion of visual images combining the grotesque in various ways (Connelly, 2003, p: 1). While the grotesque is prominently included in the romantic, symbolist, expressionist, primitive, realist and surrealist vocabulary, it also played a role in shaping cubism and some types of abstraction.

The concept of grotesque is derived from Italian as a word, both as a noun and an adjective. The words “la grottesca” and “grottesco” refer to the expression “grotta” meaning cave and distinguish a hitherto unknown,

unprecedented style of ancient art that was found in excavations in the late fifteenth century, first in Rome and then in other parts of Italy. It started to be used to do it (Kayser, 1963, p:19). As in the fields of literary and theatrical arts, the concept of grotesque has begun to be used in visual arts for forms, compositions and mise-en-scènes that contain "absurd, strange, ridiculous, frightening, exaggerated, disgusting, vulgar" elements. These meanings, which we frequently encounter in primitive ornaments, can reflect the concept of the grotesque in a concrete way. The grotesque style, which manifests itself in a certain way in fields such as performing arts, literature, painting and sculpture, has also been embodied and preserved in the field of ceramics throughout history.

Although Kimball believes that Gauguin got rid of the complexities and bewilderments of his civilized self while embracing primitiveness, he describes it as a bitter irony that he actually makes them more painfully visible (Kimball, 2003, p:112). It can be said that Gauguin, stripped of civilization and embarked on his journey for these purposes in order to reach the roots and foundations of nature and humanity, or rather the states where these elements were left untouched by civilization, in order to experience a spiritual purification, was also influenced by grotesque elements and produced works that contain grotesque impressions.

Likewise, he embodied this spiritual purification in his works and presented it as a big process project. Gauguin, a versatile artist, first worked in decorative areas in the transition from two-dimensional artworks to three-dimensional. While designing wooden products with various usage areas such as kitchen cabinets and shelves, he later met the field of ceramics and produced works in this field. Gray notes that the beginning of Gauguin's career as a ceramist was recorded in a letter he wrote to his wife in late May 1886. In the letter, he tells that the engraving craftsman M. Bracquemond introduced Gauguin to someone who wanted to produce artistic ceramics and that the person in question admired his works and agreed to produce ceramic works for himself (Gray, 1963, p:5). Witnessing all this effort and effort, it is seen that Gauguin is a great artist who should be glorified not only for the period he was in but for all periods of art history.

Method

In this study, the descriptive research method was used, a literature review was made, and information about ceramic art, the concept of the grotesque and Paul Gauguin was collected. In line with this information, the grotesque elements in the artist's ceramic works were evaluated and associated with the primitive life process he experienced.

Results and Commentary

The field of ceramics, which we can call the oldest art occupation of mankind, has created compositions as a whole with the concept of grotesque, which has as much ancient history as its own. The grotesque figures that appeared in ancient figurines first reflected the pathological anatomy deformations and carried the figures with

diseased, disabled and distorted anatomy contrary to the "normal" limited human form until today. Artists who want to break away from impressionism in visual arts have met grotesque forms in their search for abstract expression, have acquired a form of expression in their grotesque works, both consciously and unconsciously, and have often used them as a modern style. In this process of abstraction, Gauguin also produced grotesque ceramics with primitive influences in his works and contributed to this concept becoming a popular term in visual arts literature.

In this part of the study, Gauguin's ceramic works are examined and listed in terms of their grotesque features.



Image 1: Untitled, Brown Glazed Figure (Gray, 1963, p:185)

The image shows a polished portrait with a brown glaze. The work in the Musee d'Orsay museum in Paris is 28x23 cm in size. The work, dating to 1889, shows an obvious compressed figure form. The beginning and ending boundaries of the head are indistinct according to standard human anatomy. In the lower part of the figure, which is flatter, it can be said that there is a feeling that the body of the figure, which is left from the

portrait, is compressed. It is precisely here that the grotesque influences in this work can be mentioned. The figure, with a large caricature-like head and vague hands, took its place among the works of the 1880s, which critics referred to as "vulgar, savage, ignorant" and "out of the cave". With the uncertainty of whether the figure is sitting or standing, its neck, legs and feet are hidden and the head is the largest area of the composition, which may be a reference to the masks of primitive art and ancient figurines. The figure from which we can deduce that this is a human being from his portrait creates a grotesque style with the uncanny it contains in the rest of his body.



Image 2: Oviri, Brown Glazed Figure (Gray, 1963, p:247)

The dimensions of this work, which the artist called "Oviri", are 75x19x27 centimetres. It is stated that the work in the Musee d'Orsay was modelled from coarse pottery clay. The exact date of the work is not known, but there is a sketch dated 1892 of Gauguin, which is thought to belong to the work. It is thought to have been dedicated to Oviri, the goddess of mourning in Tahitian mythology. The ratio of the hands of the nude figure with a curved aesthetic stance to the body and the feeling of wearing a mask instead of a portrait can be attributed to the primitive inspirations of the artist. The disproportion of the upper part of the body to the lower part and the prominent exaggerated limbs cause dissonance in the figure. Dissonance has been one of the most prominent and common features of grotesque figures.

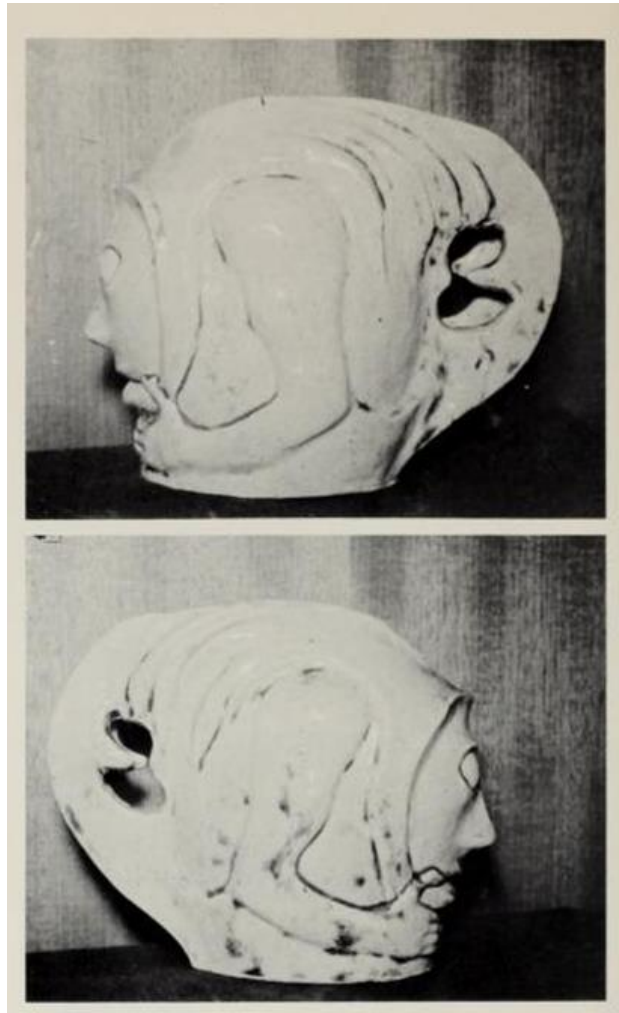


Image 3: Pot in the Form of a Grotesque Head (Gray, 1963, p:248)

The work, which is stated to belong to the Paris Maurice Malingue collection, was made as ceramic by hand shaping technique. In the work produced in the form of a jar with a handle, it is seen that the arms of the figure extend towards the mouth from both sides of the portrait. The protruding eyes and other parts of the figure are carved in low relief compared to the detailed portrait. In the study, it can be deduced that more importance is given to the portrait and facial expression than other details. The most distinctive distinctiveness in the concept of the grotesque is "organic" structures. Although the figure feels like a human portrait, it may not be a human form. With a detailed portrait, a reference to another living being is made, or it can be a description of a creature that does not exist at all. The only certainty in this distinction is that the form contains clues that it has an organic structure.

Conclusion

We can say that the grotesque style is a technique used in shaping the form and abstracting it independently from other art movements in the history of modern art. Even though we associate the way it was practised in

ancient times with the habits of primitive life and the cognitive level of those ages, the similarities in the deformations still led to the emergence of a common style. Gauguin, with his ceramic shapes among his wood carving sculptures, used the grotesque style as an instrument to abstract his forms with primitive effects in his productions. Also, Gauguin took the grotesque and made it one of the auxiliary techniques he applied in this individual war he opened against the impressionism fashion of his period and uninterrupted visual transfer.

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Misconceptions of Formal Review of Law in the Constitutional Court of Indonesia

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Abstract: This study examines the legal politics of the concept of formal review of the law (UU) in the Constitutional Court (MK). This research aims to find out the concept of formal review of the law in terms of legal politics studies of the law on the Constitutional Court. The study in this research is normative. Literature study was conducted by reviewing the legislation and related literature. This research uses a statutory approach, a conceptual approach, and a case approach. The results of the study indicate that there are misconceptions about the formal review of the law in the Constitutional Court based on the analysis of policy formulation (initiation and blueprints), 2) the attraction of political interests, and 3) the implementation of policy implementation.

Keywords: Formal Review, Law, Constitutional Court, Legal Politics

Introduction

As an actor of judicial power born after the reform, the function of the Constitutional Court (MK) can be traced from the background of its formation, that is, to uphold the supremacy of the constitution. (MK RI, 2019:18) Then this goal was confirmed in the 1945 Constitution of the Republic of Indonesia (UUD NRI 1945) which gave the Constitutional Court the authority, one of which was to conduct judicial review of the Constitution (UUD) (constitutional review). As stated in Article 24C of the 1945 Constitution of the Republic of Indonesia, as follows:

Constitutional review is divided into 2 (two) types: material review (*material toetsingrecht*) and formal review (*formele toetsingrecht*). Material review assesses in terms of the suitability between the contents of the Law and the Constitution (Asshiddiqie, 2010). This is different from a formal review, which assesses in terms of the suitability of the procedure for the formation of a law with the procedure that has been determined/regulated in the applied laws and regulations (Soemantri, 1982: 28). Jimly Asshiddiqie in another view interprets formal review more broadly, namely review which includes the suitability of the procedure for the formation of a law (formal review in the narrow sense) and also relates to all things that are not material tests (Asshiddiqie, 2010: 103-104).

Article 24C of the 1945 Constitution of the Republic of Indonesia by Fajrul Falaakh then interpreted that the 1945 Constitution of the Republic of Indonesia did not separate the authority to review the Law in the Constitutional Court into one particular type (Fallakh, 2009). Therefore, it can be said that the authority to review the Law in the Constitutional Court is the authority to review it both materially and formally.

The two types of judicial review of the judicial and formal review of law have the same degree and must be carried out in a balanced manner by the Constitutional Court (Lindle, 1975: 251). However, in fact, there is an imbalance between the material and formal judicial review of the Constitutional Court at the practical level. Until this study was conducted, the Constitutional Court had only once granted a formal test, namely in Decision No. 91/PUU-XVII/2020 regarding the formal review of Law no. 11 of 2020 concerning Job Creation (UU CK).

However, against the *a quo* decision, the Constitutional Court handed down a conditional unconstitutional decision. The Constitutional Court did not directly cancel the enforcement of the Omnibus Law on Job Creation, but delayed its enforcement by providing an opportunity for lawmakers to revise the Omnibus Law within two years. This formal decision of the Omnibus Law actually shows that there is an anomaly in the decision which actually creates the potential for new legal problems at the implementation level (Detik, 2001).

According to Eid al-Rishan, the practice of judicial review at the Constitutional Court is closer to the practice of material review. As an illustration, a formal review has been conducted on Law no. 17 of 2014 concerning the People's Consultative Assembly, the People's Representative Council, the Regional Representatives Council, and the Regional People's Representative Council (UU MD3) and Law no. 3 of 2009 concerning the Supreme Court (UU MA). In the consideration of the tribunal in the two cases, the formal trial did not have a strong legitimacy basis for the Constitutional Court. This tendency is read because the procedure for establishing laws is not regulated in the Constitution but only through laws (Rishan, 2021: 4).

In the Idul's perception, the Constitutional Court has built a *cliché* logic. That because the procedure for the formation of a law does not have a clear coordinate point in the constitution, it is not the responsibility of the Constitutional Court. That premise indirectly opens a hole that continues to exist against testing practices in the Constitutional Court. Conceptually, it would be inappropriate for the Constitutional Court to place the practice of formal and material testing diametrically. Each of these test frameworks certainly cannot be interpreted separately (Rishan, 2021: 4). The question that then arises is, what is the problem with the formal judicial review of the Law in the Constitutional Court so that the application for a formal review of a law has almost never been fully granted? One of the perspectives that can be used to find answers to these questions is to know the legal politics of the formation of the Law on the Constitutional Court, especially with regard to the authority for formal review of the Act.

According to Mahfud MD, the study of legal politics includes at least three things, *first*, state policies (official lines) regarding laws that will be enacted or not enforced in the context of achieving state goals; *Second*, the

political, economic, social, cultural background for the birth of legal products; *Third*, law enforcement in reality on field (Mahfud, 2020: 3). In line with this, Zainal Arifin Mochtar classifies the study of legal politics with three things, which consist of, 1) policy formulation (initiation and blueprints), 2) attraction of political interests, and 3) implementation of policy implementation (Mochtar, 2021).

Research Question

Based on the background of the problem that has been described previously, the research question in this research is how is the concept of a formal review of the law in terms of the study of legal politics of the Law on the Constitutional Court?

Research Purpose

Based on the research question above, this study aims to determine the concept of formal review of the law in terms of the study of legal politics of the law on the Constitutional Court.

Methods

The object of this research is the concept of formal review of the Law in the Constitutional Court based on the legal politics of the Law on the Constitutional Court. The study in this research is normative. The technique of collecting legal materials is done through literature study. Literature study was conducted by reviewing the legislation and related literature. This research uses a statutory approach, a conceptual approach, and a case approach. The type of data used is secondary data with qualitative data analysis.

Results and Discussion

Misconception of Formal Review of Law in the Constitutional Court

Jimly Asshiddiqie provides a more detailed scope regarding the formal review of the law which includes: *First*, the legal form of the regulation which talks about the conformity between form and content, between structure and substance, or between the body and spirit of a regulation. *Second*, the format of the arrangement of regulations relating to the suitability of a statutory regulation with a predetermined writing format. *Third*, the authority and involvement of institutions related to the legitimacy of the authority of institutions that make up a law, as well as the involvement of institutions related to the law that will be formed. *Fourth*, community or public participation in the formation of laws. The existence of community or public participation idealizes that everyone participates in discussing, debating, expressing pro and con stances on everything related to the content and form of the draft law before it is enacted into law. And, *fifth*, the processes that occur in each stage of the formation of the law. If you look at the definition of formal review of the law in a narrow sense, it is interpreted as covering the suitability of procedures in the formation of a law (Asshiddiqie, 2020: 109).

In general, the formal review of the law in the Constitutional Court is part of the constitutional review authority placed in the Constitutional Court. Therefore, the enforcement of the judicial review has the same spirit as the enforcement of the formal judicial review of the law. There are 5 (five) objectives of constitutional review in the Constitutional Court in the formation of a law: (Huda, 2005: 72)

1. Uphold the principle of the supremacy of the constitution.
2. Realizing a system of checks and balances.
3. As the implementation of judicial control.
4. As a counter of majoritarian mechanism.
5. Protecting human rights and citizens' constitutional rights.

If it is reviewed in the minutes of the trial on the amendments to the 1945 Constitution, the distinction in the nature of the test rights adopted has been seen to be both material and formal. This can be seen from Zain Badjeber's proposal which emphasized one of the provisions in the Judicial Powers Chapter, namely, *the Supreme Court has the authority to review statutory regulations under the provisions of the People's Consultative Assembly (MPR). So that means that the law goes down, the right to a material review and the right to a formal trial known as judicial review..*". This is also contained in Hamdan Zoelva's proposal which asserts that, *"... therefore we are of the opinion that regarding the composition and position of the Supreme Court it is strictly regulated in the Basic Law, including the authority given to it regarding the right to material and formal examination of legal products of the law below..."* (MK RI, 2010).

Based on this description, it has been seen that the concept of judicial review is well known, both materially and formally. However, the proposal is still attached to the Supreme Court. In addition, the discussion of the mechanism for reviewing the law does not talk too much about and describe the formal review (Mochtar, 2019). In the end, in the formulation of the norms of the 1945 Constitution of the Republic of Indonesia, the nature of the judicial review was not affirmed to be material or formal and had been placed in the Constitutional Court.

Then, as previously described, the legal politics of the formation of the Law on the Constitutional Court, especially with regard to the authority of the formal judicial review of the Law, according to the author, becomes important to determine the extent to which the concept of formal judicial review of the Law is positioned by the legislators and the dynamics of its implementation.

First, the formulation of policies (initiation and blueprints). The formulation of policy here is related to whether or not there is and/or to what extent the concept of formal review is described in the academic text (blueprint) of the Law on the Constitutional Court.

After being traced, both in the Statement of Proponents of the Draft Law 24 of 2003 concerning the Constitutional Court (UU MK), the Academic Paper of the Draft Law no. 8 of 2011 concerning Amendments to Law 24 of 2003 concerning the Constitutional Court, as well as the Academic Paper of the Draft Law no. 7 of

2020 concerning the Third Amendment to Law 24 of 2003 concerning the Constitutional Court, apparently does not provide a clear picture of the authority of the Constitutional Court in the concept of formal review adopted by the Constitutional Court, either in a broad or narrow sense, but only the authority for judicial review of the Law in the Constitutional Court is generally accepted, as referred to in Article 51 paragraph (3) of the Constitutional Court Law, namely "testing the Law against the Constitution".

In the Statement of Proponents of the Draft Law on the Constitutional Court which only consists of six sheets, it is said that the Constitutional Court has the function of reviewing, adjudicating, and deciding on constitutional disputes which are within its competence. The duties and powers of the Constitutional Court are as given by the Third Amendment to the Constitution, namely ... 3) reviewing laws against the Constitution (dpr.go.id). The rest, in the other two Academic Papers of the Draft Law, there is no content of the concept of the Constitutional Court's authority related to the formal review of the Law.

In addition, Article 51 paragraph (3) of the Constitutional Court Law states:

In the application as referred to in ... the applicant must clearly describe that:

- a. the formation of laws does not meet the provisions based on the 1945 Constitution of the Republic of Indonesia; and/or
- b. the content in the paragraphs, articles, and/or parts of the law is deemed to be contrary to the 1945 Constitution of the Republic of Indonesia.

The article shows the concept of semi-procedural review, namely mixing formal and material review because applications can be submitted formally and/or materially.

Jimly Asshiddiqie stated that there are 2 (two) models of law review, namely pure procedural review and semi procedural review (Asshiddiqie, 2020: 172-173). Pure procedural review places the implementation of formal review purely without relating it to material review. Meanwhile, the semi-procedural review places the implementation of review in a mixed manner, namely assessing from a formal and material perspective a law in which formal review is placed to support and complete material review.

Second, the tug for political interests, which can be identified through the minutes of the trial of the Constitutional Court Law. The Constitutional Court Law adheres to a formal review in a narrow sense, which only covers conformity of the procedure/formation of the law. Article 51 paragraph (3) of the Constitutional Court Law, states: in the case of an application for judicial review, the applicant must clearly describe: a. the formation of laws does not meet the provisions based on the Constitution....; b. ... (formal review). Meanwhile, Article 57 paragraph (2) of the Constitutional Court Law: formal examination has implications for the cancellation of the law / does not have binding legal force. Also, Article 86 of the Constitutional Court Law: *"The Constitutional Court can further regulate matters needed for the smooth implementation of its duties and authorities according to this Law"*.

Whereas then, in the minutes of the trial in the House of Representatives discussing the *a quo* Law, there has not been a serious debate about how the concept/arrangement of the formal review is desired by the legislators. In the Initial Draft of the Bill, the “Duties and Authorities” section, Article 6 letter a only mentions the authority of the Constitutional Court regarding the review of laws and regulations, there is no mention of formal and/or material judicial review of the law.

The suggestion regarding the need to regulate the authority to carry out formal judicial review of the law in addition to the material review of the law, only emerged in the response from the Reform Faction which was read out by Patrialis Akbar on January 21, 2003, that is:

The Reform Faction estimates that in the future the authority to examine laws against the basic constitution, both for material and formal review, will increase. A formal review will be carried out on the procedure for making laws, while a material review is related to the material of a law that is contrary to the constitution, contrary to the sense of justice, sociological society and human rights. In this regard, we hope that the Bill on the Constitutional Court regulates in detail and comprehensively the procedures and mechanisms for reviewing both material and formal and does not open up opportunities (lopholles) in the future”. (DPR RI, 2003)

In the end, in the Final Draft of the Bill, a distinction was made between the formal and material judicial review arrangements and the narrow adoption of the concept of formal review through the formulation: “the formation of laws that do not meet the provisions of the Constitution” (Article 51 paragraph (3)). The contents of this final draft are used until the ratification of the Constitutional Court Law.

It becomes logical when Article 86 of the Constitutional Court Law when the lawmakers submit to the Constitutional Court to be able to further regulate matters needed for the smooth implementation of their duties and authorities. This was because there was no tug for political interests, or in other words the “low political debate” regarding the broad or narrow concept of formal review had not become a concern for lawmakers at that time. Meanwhile, in the second and third amendments to the Constitutional Court Law, the concept of formal review is not included in the matter to be changed, so it does not appear in the discussion/minutes of the trial.

Third, the implementation of policy. Interestingly, because there is no clear blueprint and meaningful debate in the minutes of the trial for the formation of the Constitutional Court Law regarding the authority to review the law formally, formal review in a narrow and broad sense is used alternately and does not show consistency in its arrangement in the Regulations of the Constitutional Court (PMK) until the practice in its decision.

At first, PMK No. 6 of 2005 concerning Guidelines for Proceeding in Legal Reviewing Cases expands the meaning of formal review in the provisions of Article 4 paragraph (3), which reads “*Formal review is the review of laws relating to the process of forming laws and other matters that do not include material reviews ...*”. However, by PMK No. 9 2020 concerning Procedures in Legal Review Cases, the concept of formal review is

narrowed as stipulated in Article 2 paragraph (3), that is "*Formal review ... is a PUU against the process of forming laws that are not in accordance with the laws and regulations governing procedures the formation of laws and regulations*". Likewise in Article 2 paragraph (3) PMK No. 2 of 2021 concerning Proceedings in Cases of Judicial Review which also defines formal review in a narrow sense, which only adds objects to the regulation in lieu of law (Perppu) in addition to the PUU.

Then at the practical level, the concept of formal review also does not show consistency in its implementation. **First**, it relates to the concept of formal review which is both narrow and broad. The Constitutional Court in several of its decisions has practiced a broad or narrow formal review model, even when the Constitutional Court was still using PMK 6 2005 which incidentally expanded even formal review.

As an illustration, examples of formal review practices in a broad sense include: 1) in Decision No. 10-17-23/PUU-VII2009 concerning Judicial Review of Law no. 44 of 2009 concerning Pornography. The Constitutional Court reviews the systematics to the suitability of setting the definition, this is more than just a formal review that is limited to procedures or in a broad sense; 2) in Decision No. 73/PUU-XII/2014 and 79/PUU-XII/2014 concerning Judicial Review of Law No. 17 of 2014 concerning the MPR, DPR, DPD and DPRD, the Court reviews the involvement of institutions in this case the DPD; 3) in Decision No. 37/PUU-XVII/2020 concerning Judicial Review of Law No. 2 of 2020 concerning the Stipulation of Perppu No. 1 of 2020, the Constitutional Court also tested the involvement of the DPD.

Meanwhile, examples of formal review practices in a narrow sense, among others: 1) in Decision No. 140/PUU-VII/2009 concerning the Review of Law 1/PnPs/1965 concerning the Prevention of Abuse and/or Blasphemy of Religion, the Court did not review the systematics and relationships between articles, explanations, and attachments; and 2) in Decision No. 51/PUU-XIII/2015 concerning Review of Law No. 8 of 2015 concerning Amendments to Law No. 1 of 2015 concerning Stipulation of No. 1 of 2014 concerning the Election of Governors, Regents and Mayors, the Constitutional Court said that what the applicant argued was not a formal review, that the formal review was related to the formation of regulations.

Second, it relates to the formal review model adopted by the Constitutional Court. The Constitutional Court in several of its decisions also seems inconsistent in applying a formal reviewing model. In Decision No. 27/PUU-VII/2009 concerning Review of Law no. 3 of 2009 concerning the Second Amendment to Law no. 14 of 1985 concerning the Supreme Court, the Constitutional Court seems to apply a semi-procedural review model, namely placing the implementation of review in a mixed manner, namely evaluating from a formal and material perspective a law where formal review is placed to support and complete material review. Then, in No. 73/PUU-XII/2014 and Decision No. 140/PUU-VII/2009 The Constitutional Court also shows the consideration that it is not always a law that is formed with bad procedures, so the material content will not be good. It can be seen, in the consideration of this Constitutional Court, that formal review is mixed with material review.

However, the Constitutional Court later showed a shift in the practice of formal review in Decision No. 79/PUU-XVII/2020 concerning the Judicial Review of the Corruption Eradication Commission Law. The Constitutional Court opens the space for splitting formal and material review cases, but this is optional, so it has not confirmed the application of pure procedural review or semi-procedural review. Meanwhile, in Decision No. 91/PUU-XVII/2020, the Constitutional Court seems to apply a review model that is pure procedural review, namely carrying out purely formal review without relating it to material review.

Closing

Based on the description above, it can be seen that there is no clear blueprint related to the concept of formal review in the Constitutional Court. Basically, the legislators have regulated the concept of reviewing the law in a narrow way as well as the concept of semi-procedural review, but without any serious debate and theoretical basis or the low level of political debate on the legislators. So that in the end, the Constitutional Court has open space for interpretation to be able to further regulate matters needed for the smooth implementation of its duties and authorities. In addition, there are inconsistencies related to the concept of formal review, which is narrow or broad, as well as related to the formal review model adopted by the Constitutional Court. Thus, the authors conclude that there is a conception of the formal review of the law in the Constitutional Court.

Notes

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Grotesque Approaches in Photo Manipulation Works

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Abstract: Different forms of expression appear in every field of art. Formal interventions on concrete images can stimulate the audience's aesthetic sense at different frequencies, while giving the audience information about the artist. As with other works of art, works derived from photography and considered as "manipulation" can also contain formal and colour interventions. In interventions made on form and anatomy, exaggerations, unusually striking disproportion, dissonance, and deformations can be seen. Many artistic production practices can be found today, such as transforming the photographs of the same figure from different angles on a single composition but transforming the figure into another form with the intervention of the artist, exaggerating the limbs and distorting the body proportions, or bringing together the images of different figures to build a new organic structure. Photography continues to exist as a very convenient and up-to-date technique and tool in constructing grotesque forms and structures, whether through manipulation or collage applications. In the study, evaluations were made on the examples on this subject.

Keywords: Grotesque, Photo Manipulation, Art.

Introduction

Since 1839, photography has been a vital means of communication and expression (Newhall, 1982, p:7). The "daguerreotype" process as the ability of human beings to freeze, stop and capture a memory in a photographic image, has still fascinated us since its invention and announcement in 1839 (Pritchard, 2014, p:6). However, the most progressive artists have been (and still are) concerned with the question of the artistic value of photography from the very beginning. As a visual archive, photographs were much easier to manipulate than works of art or even nature itself, and a wide range of artists including Manet, Degas, Cézanne, Gauguin, Toulouse-Lautrec, Rousseau, Picasso's Warhol, Rauschenberg, Bacon and Hamilton used photography as the basis for their works to an enormous extent (Kahmen, 1974, p:18). Photography has continued its existence as a very convenient and up-to-date technique and tool in constructing grotesque forms and structures, whether through manipulation or collage applications. Likewise, the concept of the grotesque has been a style that is

frequently encountered in figurative abstractions and in the artistic adventure that extends to expressionism.

Manipulations of images enable the manipulation of reality, highlighting the dominance of visual stimuli in triggering certain ideas or emotions (Bostancı, 2017, p:120). The ability to bend the image as he wishes and play with reality has been a frequently desired concern of artists, especially in the field of visual arts. Artists aimed to convey the feelings, ideas and thoughts they want to convey to the audience, the pleasures and disgust they want to arouse in them, with efficiency in this way. Playing with the perception of reality has also enabled artists to create new worlds and spaces in their own artistic atmospheres where their own rules are valid. From past to present, images or photographs remain the most powerful tools to convey and translate information, meaning and emotions. The ability to determine how a photo will affect viewers begins the moment the photo is taken. Long before it was controlled by computer software, the photographer allowed us to see reality the way he wanted us to see it.

Grotesque (both as a noun and an adjective) and the corresponding words in other languages were eventually derived from Italian. "La grottesca" and "grottesco" mean "grotta (cave)" and were made in the late fifteenth century to denote a particular style of ornament that emerged during excavations, first in Rome and later in other parts of Italy (Kayser, 1963, p:18). However, this ornamentation style, which includes different hybrid organic structures, the like of which was rarely seen before, is becoming more and more "extraordinary, absurd, strange, disturbing, ridiculous, exaggerated, etc." It has begun to be used for situations and even for artistic forms that reflect these situations. According to Aktulum, real beings and imaginary beings, creatures are seen intertwined in grotesque paintings. The definitions of grotesque are mostly based on a certain type of painting. Weird, strange, odd, absurd, distorted, intriguing, ridiculous, worrisome, etc. it is seen that the qualifications are repeated in the definitions made (Aktulum,2020, p:14).

"These separate currents first came together in the early 1960s. A dramatic increase in the quantity and quality of photography education in America has spawned a generation of highly educated, influential photographers with a broad background in the history of their media. They began their careers as professional artists with a decade of fermentation and experimentation in all the arts. Inevitably, they brought the same energies to photography, and in a certain way—literary critics have called it "black humour"—they struck a sensitive chord with a surprisingly large audience" (Coleman, 1977, p: 12).

Said chord has been seen as a negative, even decadent attitude compared to most previous standards. Although it was often extremely sultry and wildly funny, it seemed cheesy. The madness, the paranoia, the hallucination, the ugliness—these have been fruitful aspects of this form. Nevertheless, it could be said that it was definitely an attitude compatible with it, not because it was imposed on the age, but because it was born naturally from it. The importance of this phenomenon has only just begun to be understood and discovered. It can be inferred that dark humour in literature is the source of increased activity in the grotesque style of photography, but this is not certain and true. Sources liken it only to indicate a parallel. The rise of black humour in literature is not unique to that particular point in history. It has an equivalent in contemporary photography.

Method

In the research, in which the descriptive research method was used, information about the art of photography, photo manipulation and grotesque concepts was collected by scanning the literature. In line with this information, organic structure formations and figurative elements in photo-manipulative works were evaluated in the context of the grotesque.

Results and Commentary

The work in “Image 1” belongs to the 1973 Danish-born photographer Asger Carlsen, who is best known for his admiration for distorted human figures. The back part of a human figure is seen in the black-and-white work. Instead of a naturally healthy body image, the hip structure that should be located in the lower part of the body and the absence of legs cause a different organic form to be perceived. The folds and piles at the bottom of the form have realistically reflected the viewer, even if they are manipulated.

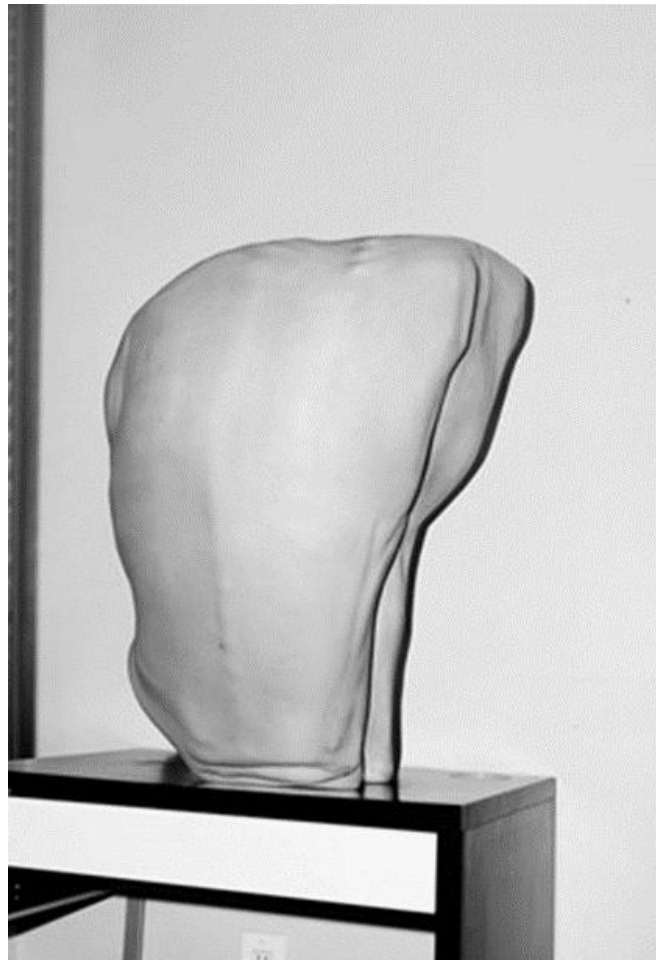


Image 1. Hester (17), 2012



Image 2. Noname, 2011

Carlsen's creation of grotesque series by distorting the human anatomy first emerged in 2006 when he started playing with images in the computer environment while he was a commercial photographer. Carlsen, who initially placed several different human portraits on top of each other by making photo manipulations in the computer environment, started to break the symmetry of the figures by distorting the proportions of the limbs, size differences and unusual reproductions (Public Delivery, 2022). The images he obtained, such as portraits with multiple eyes, impressed and surprised him and encouraged the artist to work in this direction.

In the work presented in image two, which belongs to the same artist, it is seen that the human body moves against its own limits and evokes the feeling of being a hybrid structure. It can be said that the organic form, which seems to have emerged as a result of the fusion of two different human bodies, was photographed in a natural environment and was effective in creating a higher perception of naturalness and realism. Joints that should not be there, spines and limbs that can offer reverse movements have become indispensable elements of grotesque figures.

The artwork named Jane Euler in the series "Detail of Global Alerts (Persons over 100)" belongs to photographer Kristien Daem. The artist reinterpreted the portrait of an elderly woman by interfering with the places of her limbs. The eyes are not sided by side as they should be, on the contrary, they are rearranged starting from the bottom and forehead, and the lips are positioned by changing their angles in the area where they are. In this technique, which is closer to digital collage, the combinations and parts of the image that are cut and intervened are easily selected. It can be said that this work, which is far from eerie, presents an extraordinary portrait and is closer to the concepts of strangeness and absurdity.



Image 3. Jana Euler, 2018

Conclusion

As in almost every field of art, grotesque elements were used in photography, and strange, absurd, irritating, frightening and exaggerated compositions and forms were presented to the audience in the windows opened by the artists. In the same way, the artists wanted to strengthen their expressions even more with photo manipulations to these effects that the art of photography presents only, and they tried to make the scenes they presented more concentrated.

Artists who practice other than classical aesthetic perception, such as Carlsen, who states that his works are concerned with the appearance of sculpture and at the same time photography (Jones, 2012), are inspired by artists such as Francis Bacon and Hans Bellmer, who have taken the path of the grotesque theory before, to reach the aesthetic of the ugly and to reach the aesthetics of the beauty-aesthetic concepts. trying to break the traditional bond.

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Loan Words in the Terminological Lexicon of Computer Science in the Albanian Language

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Abstract: The focus of this scientific work is borrowed terms of terminological lexicon in the field of computer science in the Albanian language. Therefore, this lexicon considered as a separate entity includes the following:

- the lexicon borrowed from English language, such as: *kompjuter (computer)*, *modem (modem)*, *harduer (hardware)*, *softuer (software)*, etc.
- the lexicon borrowed from own Albanian language. Here we consider words taken from the Albanian language overall and transformed into terms such as: *mi (mouse)*, *flamur (flag)*, *dritare (window)*, etc.
- the lexicon borrowed from other sciences. Here we consider words-terms (foreign, Albanian or Albanized ones) which are obtained from other sciences, such as: from the science of physics: *atom (atom)*; linguistics: *tekst (text)*; mathematics: *ekuacion (equation)*, etc.

This study uses the method of induction and analysis. It concludes that this lexicon is of special interest for Albanian linguistics, so the need arises to study it in further details. For reader's convenience, examples are presented both in Albanian and English.

Keywords: Computer Science, Term, Terminological Lexicon, Borrowing, Albanian Language

Introduction

Computer science is a science that has found various applications in media, economics, medicine, linguistics, agriculture, sports, entertainment, etc. Briefly, the entire human life has been computerized. The internet itself has become such an important tool of our daily life that most people cannot perceive life without it. Social networks like facebook, instagram, twitter, linkedln have offered greater skills to users to communicate with a wider audience. The development of information technology and means of communication constitutes one of the aspects of the globalization process that has marked great steps to push this process forward. (Duro & Vrap, 2005. p.25) Computer science studies laws of retrieving, exchanging, converting, searching and disseminating information through modern tools and techniques. It includes informatics as a science, information theory, scholarly/scientific documentation (language, texts and storage media), library activity, text processing and translation, coding, indexing, information processing, transmission and programming of information (computer

technology) as well as a series of sub-sections related to copying, microfilm, etc. The development of the aforementioned in their entirety, is related to the rapid development of science and technology. Such evolution has conditioned the creation of a range of new scientific and technical concepts. These concepts have also corresponding names (terms), which make their way along with the concepts from one language to another. A stock of terms of interest to study is thus created within the fund of each language, a considerable part of which has derived from major languages, mainly English. This terminology is increasingly gaining importance in all languages, due to the growing number of users of new information technology equipment and software across all countries and categories of the population as well. These tools and programs come mainly from the United States of America, along with the accompanying documentation with English relevant terms. Hence, non-English speaking countries are faced with issues of translation into their own language, issues of documentation and software relevant to these tools and programs, often once they have been put into use. This requires for translators and terminologists in these countries to analyze the source term and find the appropriate and accurate equivalent in their own language.

The object of work in this scholarly presentation concerns borrowed terms in the lexicon of computer science in the Albanian language. The lexicon of computer science is an integral part of the lexicon of the standard Albanian language. This terminology consists mainly in generally English-derived foreign terms, such as: *kompjuter (computer)*; *modem (modem)*; *monitor (monitor)*, etc. This presentation will show that there are several ways to enrich computer science-related terminology.

Method

This scientific work reviews these linguistic phenomena based on respective international and Albanian references, accompanied with concrete examples mostly extracted from computer science vocabularies published in Albanian speaking countries. Resorting to induction method and descriptive analysis, this paper aims to come to some concrete conclusions to give way to other analyses on this field.

Results

Computer science terminology, as a specialized language (Piht, 1985. p.15.), is identified through the relevant terms. It constitutes a separate lexical subsystem within the lexical system of the standard Albanian language. As an integral part of the standard Albanian language lexicon, it has adopted an opposing position to the general lexicon through specialized elements, ie through terms, but also interacts with it. The predominance of the terminological lexicon over the general one makes the presentation of ideas more uniform to be expressed and enters into more schematic and standardized phrases. The study of computer science terminology enables us to highlight some linguistic problems related to the ways of creating terms (term building) but also to the sources of terms (Duro, 2012. p.20).

First: It is necessary to schematically present how has the computer science terminology made its way/fitted into the standard Albanian language.

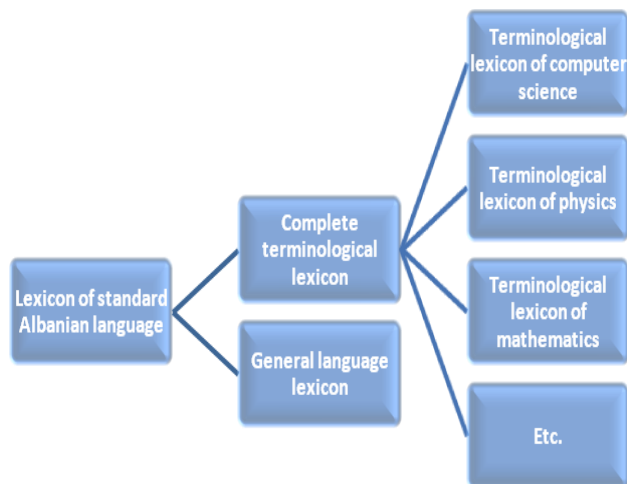


Figure 1. Lexicon of Standard Albanian Language

Second: From observations made to the terminological lexicon of computer science, it is noted that the first source layer is foreign terms derived mainly from English, as an internationally used language. These terms show specific concepts of computer science already found both in languages of widely developed terminology, for example in French, Italian, Russian, as well as in those of developing terminologies such as Albanian. Such a finding is based on the quantitative predominance of these terms in textbooks, guides as well as in terminological dictionaries of computer science. As an illustration, let's bring a range of terms directly sourced from English such as: *absortancë (absortance)*, *adapter (adapter)*, *aplikacion (application)*, *autput (output)*, *alfanumerik (alphanumeric)*, *alfamozaik (alphamozaic)*, *ankorë (anchor)*, *android (android)*, *bajt (byte)*, *bit (bit)*, *bus (bus)*, *deskriptor (descriptor)*, *digjital (digital)*, *direktori (directory)*, *drajv (drive)*, *font (font)*, *folder (folder)*, *fajl (file)*, *gigabajt (gigabyte)*, *haker (hacer)*, *harduer (hardware)*, *harddisk (harddisc)*, *kompjuter (software)*, *karakter (character)*, *kompaktdisk (compactdisc)*, *monitor (monitor)*, *modem (modem)*, *memo (memo)*, *mikroçip (microchip)*, *mikrokod (microcod)*, *mikrokompjuter (microcomputer)*, *mikrokod (microcod)*, *softuer (software)*, *skaner (scanner)*, *skanoj (scan)*, *selektuj (select)*, *server (server)*, *terminal (terminal)*, *terminator (terminator)* etc. These units appear in texts as single units, e.g., *kompjuter (computer)*, as hybrid units, e.g., *kompjuterizoj (computerize)* and *kompjuterizim (computerization)* or as units that create multiple collocations, e.g., from the unit - *kompjuter (computer)* are formed: *kompjuter digjital (digital computer)*, *kompjuter analog (analog computer)*, *kompjuter optik (optic computer)* etc; or coupled with *fajl (file)* term, are formed: *fajl aktiv (active file)*, *fajl zanor (audio file)* *fajl grafik (graphic file)*, *fajl i zbatimit (application file)* etc; from the unit *printer (printer)* are formed: *printer aktiv (active printer)*, *printer digjital (digital printer)*, *printer vitual (virtual printer)*, *printer termik (thermal printer)*, *printer paralel (parallel printer)* etc; ose using *server (server)* term, are formed: *server i aksesit (access server)*, *server i faksit (fax server)*, *server i jashtëm (external server)* *server virtual (virtual server)* etc. (Caka & Rodiqi, 2005)

Third: The following terms (which can be borrowed, Albanian or Albanized) that enter the Albanian terminology of computer science from other sciences, are also very important:

- from maths, such as: *abshisë* (*abscissa*), *aritmetikë* (*arithmetic*), *ekuacion* (*equation*), *elips* (*ellipse*), *matricë* (*matrix*), *diagram* (*diagram*), *ordinatë* (*ordinate*), *matematikë* (*mathematics*), *rreth* (*circle*), *thyesë* (*fraction*), etc.
- from physics, such as: *amplitudë* (*amplitude*), *automat* (*automaton*), *akustikë* (*acoustics*), *amper* (*ampere*), *atom* (*atom*), *denduri* (*density*), *dipolar* (*bipolar*), *frekuencë* (*frequency*), *forcë* (*force*), *tension* (*voltage*), *qark* (*circuit*), *rrymë* (*current*), *valë* (*wave*), etc.
- from linguistics, such as: *alfabet* (*alphabet*), *fonemë* (*phoneme*), *diktim* (*dictation*), *diktoj* (*dictate*), *dialog* (*dialogue*), *dialekt* (*dialekt*), *fjalë* (*word*), *fjali* (*sentence*), *gramatikë* (*grammar*), *kontekst* (*context*), *morfologji* (*morphology*), *morfemë* (*morpheme*), *semantikë* (*semantics*), *sintaksë* (*syntax*), *tekst* (*test*), etc.
- from electronics, such as: *elektronikë* (*electronics*), *panel* (*panel*), *termorezistencë* (*therminal resistor*), etc.
- from logic, such as: *analizë* (*analysis*), *argument* (*argument*), *atribut*, *deduksion* (*deduction*), *formal* (*formal*), *induksion* (*induction*), *logjikë* (*logic*), *hulumtim* (*research*), etc.
- from economics, such as: *administrator*, *bilanc* (*balance*), *biznes* (*business*), *blej* (*buy*), *kontratë* (*contract*), *konsum* (*consum*), *konsumim* (*consuming*), *klient* (*client, customer*), *taksë* (*tax*), etc.
- from psychology, such as: *tautologji* (*tautology*) *redundancë* (*redundance*), *metodë* (*method*), *metodologji* (*methodology*), *model* (*model, pattern*), etc.
- from medicine, such as: *bakter* (*bacterium*), *diagnozë* (*diagnostics*), *diafragmë* (*diaphragm*), *operacion* (*operation*), *qelizë* (*cell*), *virus* (*virus*), etc.
- Even these terms can be presented in the text as single ones, e.g., *analizë* (*analysis*) or as part of other collocations, e.g., *analizë e fajlit* (*file analysis*), *analizë e orientuar me objekte* (*objected-oriented analysis*), *analizë e rrjedhjes* (*flow analysis*), *analizë e të dhënave* (*data analysis*), *analizë sintaktike* (*syntactic analysis*) etc.; *virus* (*virus*): *virus i vetëriprodhueshëm* (*self-replicating virus*), *virus jokeqbërës* (*benign virus*), *virus parazit* (*parasitic virus*) etc.

Fourth: The common words transformed into terms such as: *bashkoj* (*join*), *bashkim* (*join*), *bisedim* (*interactive talk*), *i butë* (*soft*), *dalje* (*exit*), *derë* (*door*), *degë* (*branch*), *detyrë* (*task*), *dëng* (*pack*) *dërdëllitje* (*jabber*), *dërgoj* (*send*), *dërgues* (*originator*), *deriçkë* (*back door*), *dritare* (*window*), *ditar* (*diary*), *mi* (*mouse*), *djeg*, *flamur* (*flag*), etc., make up another important group as well. These words can appear both as single terms, e.g., *ditar* (*diary*) and in collocations, e.g., *ditar elektronik* (*electronic diary*); *ditar pune*, *dëng dhe dëng disqesh*; *derë dhe derë e prapme*; *detyrë dhe detyrë kryesore*, *detyrë paketoare*, *detyrë active*. These units can be divided into two groups:

- with unchanged meaning as words and as terms, e.g: *detyrë* (*task*), *dërgoj* (*send*), *bashkim* (*union*) etc.
- with changed meaning when the word is transformed/becomes a term, e.g: *mi* (*mouse*), *derë* (*door*), *dritare*, (*window*) etc.

From presentation of the above groups viewed from the perspective of their entry into the terminology of the computer science field, it is noticed that these units are not always uniform. Thus, in some cases it is noticed that foreign terms are used alongside the dual variants (Albanian or Albanianized), for example, albanian *mi* and *miush* are used in addition to *mouse*, or *fjalëkalim* is used in addition to *password*. It is also noticed that most of the terms in this terminology are foreign terms and the remaining portion make up terms built on the basis of common words such as *dritare* (*window*), *degë* (*branch*), etc. These terms are often interchangeably used, which requires a more in-depth study from the perspective of these units relationships when entering the process of their functioning in specialized discourse.

Further study from this perspective should shed light on the position to be adopted towards competing dual terms, as well as their reflection in terminological dictionaries. On the other hand, the possibilities for further Albanianizations with the Albanian dough or with the creation of terms upon its word-formation tools can arise as a problem. This can be seen in the Albanian word *mi* for *mouse* while in the Albanian Dictionary of 2006, the word *miush* is given for the word *mi*, which marks a more accurate semantic differentiation of the concept. This issue requires further in-depth exploration, which I think will permanently remain open regarding this terminology of high interest of study.

Conclusion

After carefully studying the lexicon of computer science (here meaning the study of textbooks, academic and scholarly texts of computer science), the conclusion is reached that this lexicon consists in:

- the lexicon borrowed from English language, such as: *kompjuter* (*computer*), *modem* (*modem*), *harduer* (*hardware*), *softuer* (*software*), etc.
- the lexicon borrowed from own Albanian language. Here we consider words taken from the Albanian language overall and transformed into terms such as: *mi* (*mouse*), *flamur* (*flag*), *dritare* (*window*), etc.
- the lexicon borrowed from other sciences. Here we consider words-terms (foreign, Albanian or Albanized ones) which are obtained from other sciences, such as: from the science of physics: *atom* (*atom*); linguistics: *tekst* (*text*); mathematics: *ekuacion* (*equation*), etc.

Recommendations

The terminological lexicon of computer science has been steadily making its way into the Albanian language. In such conditions it needs:

- More in-depth analysis and research work in order to solve numerous language issues arising as a result of such a go-through.
- Close collaboration between terminologists and computer science experts would offer new opportunities and research spaces for further studies.

Notes

For reader's convenience, examples are presented in both Albanian and English.

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From Waste Object to Sculpture: Mervan Altınorak

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Abstract: From past to present, art has exhibited different pursuits in terms of intellectual, technical and material in every period, and it has also increased the material diversity of the art object. Especially with the development of the industry, ready-made objects other than stone, bronze, clay, plaster, metal and wood have been used to obtain different plastic textures in the field of sculpture. In this context, the artist created a new field of art by using the industrial wastes left by the society and obtaining different forms in the consumer society that is formed in the order that is constantly renewing itself with the technological developments. Sculptor Mervan Altınorak, one of these artists, sees various waste objects as a mosaic piece and gives shape to the sculpture. With this new form of expression, Altınorak aimed to make the society more sensitive to unconscious consumption. It is known that the unconscious consumption of resources in the world has turned into various environmental problems over time and continues. Today, many sculpture artists such as Mervan Altınorak have changed the task of ready-made objects by using industrial wastes as art materials in order to prevent unconscious consumption. In the study, semi-structured interviews were conducted with the artist Mervan Altınorak in order to describe the transformation of the ready-made object, which is an industrial waste, into a work of art, and the work analysis method was used on several of the artist's works.

Keywords: Artistic Transformation, Sculpture, Waste Object, Mervan Altınorak

Introduction

The sculptor should know the essence of the material he used according to the time he was in. (M. Yılmaz, 2006:38) Sculpture making method is generally in the form of masonry, chipping and construction. The stacking method is used for soft materials such as clay. The chipping method, on the other hand, is shaping by chipping to transform a mass material into the desired shape. Sculpture is created by carving off excess material such as wood and marble. The construction method, on the other hand, is newer than other methods in that it emerged with the painting art movement cubism in the first quarter of the 20th century. Cubist artists Picasso and Brancusi worked by breaking apart the objects and reassembling them on the canvas. These experiments on the

surface gradually progressed to three-dimensional works and became a turning point in art. Picasso's works, which were formed with the idea of sculpting all kinds of materials instead of stone, wood and plaster, constitute the first examples in construction.



Picture 1. Picasso-Guitar, <https://mindonart.com/2013/04/19/k-o-l-a-jpicasso-guitar-sculpturesculpture>

Artists such as Vladimir Tatlin, Aleksander Rodchenko, Naum Gabo, and Aleksander Calder were influenced by this approach of cubism and tried to interpret it in various ways. Despite the different interpretations of the artists, the sculptures are, in many respects, the interpretation of industry and technology through the artist. There is no material limit in such sculptures (M. Yılmaz, 2006:59).

Industry creates a pressure mechanism in human life. In a way, it changes people physically and spiritually and owns them.(Turani, 2011:88) XX. It was the film of Charlie Chaplin (Modern Times) in the second quarter of the century. Despite technological developments and advances in science, the fact that a large part of the world's population is hungry is a contradiction. It is seen that every change in the field of art takes place after some social events. The first time the object was added to art began in the period of electronic mechanization, which was more advanced than human steam and electrical machines, liberated after the Second World War in 1945. The modern world has been bombarded with montages that people cannot understand how they are made. Assembly art; It is based on a composition consisting of the alienation of the items extracted from the fragmentation of objects from each other (Turani, 2011:137). The cutting and cutting of objects in plastic arts started with the cubists and developed with the Dadaists, and then reached the surrealists and pop art. As the range of technological possibilities of the age developed, art benefited from this diversity of materials and technology. The mass production created by industrialization and the necessity of ensuring the continuity of the market with various media opportunities for the continuation of this production has created the consumption society. Based on this, the waste object was formed as a result of the consumption of the ready-made object in the modern coded disposable structure.

Use of Waste Objects as Sculpture Material in the Historical Process

Influenced by Picasso, who used all kinds of waste materials in his paintings and pushed the limits, Giacometti started to make his first waste object sculpture experiments in sculpture in the 1930s. An example of this is at 4 in the morning. Later, influenced by the American sculptor Aleksander Calder, Joan Miro, Picasso, construction artists and Mondrian, he turned the machine car and airplane parts into sculptures and painted the balance he believed to be in the universe. In addition, sculptor David Smith, one of the representatives of the Abstract Expressionist movement, was influenced by the welding works of Picasso and Gonzales, and made his first sculptures from iron pieces he collected from the junkyard, with his experience working in the factory that made tanks and locomotives, where he worked before. These sculptures resembled three-dimensional lines standing or wandering in space. For example, Australia, 1951 study. Apart from this, we can count the Italian Berto Lardera working with waste materials and the British sculptor Anthony Caro. In Turkey, although such approaches started with Ali Hadi Bara and Zühtü Müridoğlu in the 1950s and gained momentum with İlhan Koman and Kuzgun Acar, the abstract sculptures of İlhan Koman and Kuzgun Acar could not be understood sufficiently. At first, Kuzgun Acar used ready-made materials he collected such as bones, logs, branches, reeds, scrap machine parts, rusty nails, and later he worked with mostly scrap metal and nails that he used most frequently (M. Yılmaz, 2013:244).



Picture 2. Kuzgun Acar, Masks, <http://www.leblebitozu.com/kuzgun-acarin-eserleri-ve-hayati/>

Even though the waste object was used in these periods, the artists who produced it were not fully aware that the industrial waste object was the material of the sculpture as a reflection of the changing social structure. Today, these methods are applied in various forms of expression in contemporary sculpture art. Artist Mervan Altınorak is one of the sculptors who continue these practices in our country.

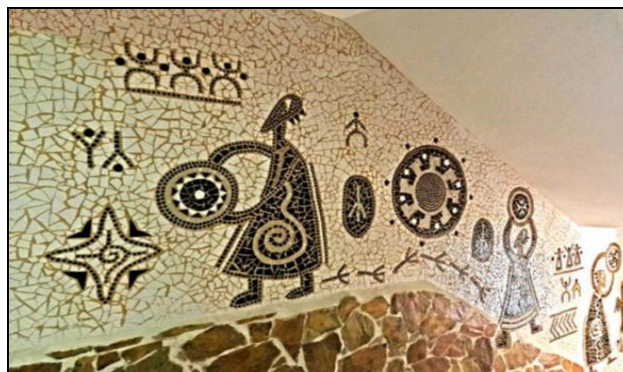
Mervan Altınorak's Art Concept

Born in 1970 in the Reyhanlı district of Hatay, Mervan Altınorak started his first artistic works with mosaics. Altınorak, who gave place to mosaic works in the classical sense, later made contemporary mosaics and then

started to produce original works. He made mosaic work in a large area of 4000 square meters by pushing the size limits of the mosaic. These mosaics were where he first evaluated the waste. He formed the composition of the mosaic by dividing the tiles, wood, stone and construction surpluses he found into pieces in appropriate sizes. With this orientation, the artist reminds the works of the architect Gaudi. In order to create a solid structure in his works, Gaudi transforms waste ceramics with a technique called 'Trencadis' and evaluates them in handmade mosaic works. With this understanding, Gaudi left original works by evaluating the waste pieces of the ceramic industry and combining them with a mortar (Ok, 2020).



Picture 3. Mervan Altinorak /Gaudi Window, <http://mimdap.org/2007/10/antoni-gaudi-mimarlydhy/>



Picture 4. Mervan Altinorak /Mosaic work

After Mervan Altinorak's mosaic works made from waste ceramics, he was asked to design a foot for a mosaic table top that he made, and the artist provided the desired shape by transforming the waste object, that is, metal waste, by transforming the waste object, that is, metal waste, with the problem of how to make this foot most suitable for mosaic. The table leg he created was the beginning of the artist's sculpture work with waste objects. From this point of view, he started experimenting with various animal figures. As the artist's work increased, the waste objects he used diversified. These waste objects used by the artist have become forms as three-dimensional techniques as a collage or montage on top of each other. In the words of Burhan Yılmaz (B.Yılmaz, 2015:188); In contemporary art works, it has been seen that accumulation and assembly is a technique used especially in sculptures. Thus, waste objects are changed into works of art.



Picture 5. Mervan Altınorak / Table Leg Sculpture

Mervan Altınorak stated that while waste objects turn into works of art, they bring a different message to the sculpture and expressed his understanding of art as follows:

I have worked in both contemporary and classical mosaics in the past, but creating a sculpture form by using different materials, especially using waste objects with the possibilities of contemporary art with creativity, made the message I want to convey more effective. Especially in Turkey, I saw that sculpture works from waste objects were not enough. In order to raise public awareness on environmental awareness and the transformation of waste objects, I started to use plastic, wood and other waste objects, especially waste metal (Altınorak, 2021).

For this purpose, he collects various materials that he can transform from the coast, industry and houses at regular intervals in order to find various waste materials for Altınorak sculptures. The artist collects them by classifying them in the warehouse in his workshop. Altınorak, thanks to his past mosaic experience, adjusts the whole size and smallness of the objects he collects, and easily assembles the waste objects during the formation phase of the sculpture. In the words of Stankiewicz and Krug (1997,2) the dimensions of the relationship of Contemporary Artists with their environment; Art and ecology must collaborate to identify environmental problems. The change in the way of life of the society and its transformation into a consumer society has imposed a social task on the ecologically sourced works of art. In this context, many artists have mostly focused on humans in their environmental works. Artists have tried to raise awareness of the society through metaphors in their works.

Mervan Altınorak, on the other hand, expresses the transformation of waste objects into ecological art in his works:

Although the use of waste objects in different areas is a message rather than sculpture, I add all kinds of waste to my works without material limit, but I generally use electronic, plastic waste, metal waste from the sea in sculpture. But from time to time, I work on the upcycling of the waste object by converting it from household needs to kitchenware and sometimes sports equipment. The waste object can be used not only in the field of art but also for objects for daily life needs. This is not recycling, it is upcycling, it is the transformation of the existing material into a new form with the additions on the waste object (Altinorak, 2021).

In the 20th century, with the emergence of different searches in art, material has gained more importance in terms of aesthetics. Contemporary artists, in particular, consider the material as the purpose of the work or as a creative discourse. Artists have expanded the material limits of the century by presenting waste material to art as an art object. One of the purposes of this is a reaction against the commodification of art (Yücel, 2020).

In addition, since any increase in consumption brought by the industrial society brings various environmental problems, if a solution is not found for the increase in waste production and the transformation of these wastes, the environmental pollution, living population change, atmospheric pollution and diseases will continue to increase (Yücel, 2020). Mervan Altinorak, who cannot remain indifferent to the way it covers our environment, tries to make the objects used by the society questioned by referring to the consumption society through the transformation of waste objects.

Transformation Process of Waste Objects into Sculpture Evaluated by Mervan Altinorak

Mervan Altinorak tries to ensure that they are ready in case of need by obtaining sufficient waste materials and classifying them separately before starting their work. For the artist, the most time-consuming work in the production process is the collection of suitable pieces.



Picture 6. Image from Mervan Altinorak's workshop. Picture 7. Image from Mervan Altinorak's workshop

Mervan Altınorak expresses the stages of evaluating the time and the physical conditions of the environment in the process of transforming the waste objects he collects into works of art;

I first start by collecting objects from scrap dealers, industry and the seaside beach. Afterwards, these objects are metal, plastic, etc. I classify them according to their shape and size and place them in the warehouse. When I come to the construction stage of the sculpture, I start by creating anatomy. I usually work on animal figures. I try to memorize the anatomy of the animal I will make and try to analyze the bone structure, skin and hair down to the smallest detail. Then I make the base, skeleton, bones, muscles and then the details. (Altınorak, 2021)

The waste object is kept in the warehouse until the appropriate sculpture form for the object to be used to form a whole in the artist's work is decided. The artist mostly prefers to integrate metal and digital parts in his works. Altınorak is of the opinion that the sculptures he made of metal and digital pieces better describe the uncontrolled consumption of the society through various post-industrial transfer tools. Objects around us are tools we use for our mundane and functional daily activities.

The instinct of human beings to possess an object is for the need to maintain control in life. Another reason is the human tendency to create a separate and private world. In this direction, objects become subjective. Because the meaning of the object, which is excluded from its duty, is completely relative to the subject (Dogruer, 2008, 52).

Examples of Mervan Altınorak's Sculptures

In this work, there is a horse sculpture with a rearing appearance, standing on its hind legs and raising its front legs and head. The whole horse sculpture consists of metal parts. Its average height is 2.50 m. its weight is up to 500 kg. The study was carried out in a period of 4 months and approximately 25000 waste objects were used.

The metal parts in the work are the industrial, domestic wastes and the wastes that the artist collects from the coast at regular intervals. When we look at the study in general terms, there are machine parts such as wheels and gears. Large and small pieces were placed not only at certain points but throughout the work. There is no symmetrical placement. For the mane and tail of the horse, unlike other places, the artist, who pays attention to the texture, bent and twisted the thin rebars to provide the appropriate movement. In the head part of the statue, it is seen that he chose very textured metal pieces.

In general, circle-shaped metal parts are seen in the study. This work reminds us first hand of Kuzgun Acar's 'Masks'. Like Acar, Altınorak created his work by making use of the waste objects found around us. The uniqueness of the work of art has been questioned with the animal-shaped sculpture created using waste objects. Altınorak enables us to question the waste object that we use, consume and throw out of our lives. It also helps us to understand in a different form that the story of the object we see as waste is not over.



Picture 8. Mervan Altınorak, Horse Statu



Picture 9. Mervan Altınorak, Elegance

240 pieces of forks, springs, balls, pipes and motorcycle fuel tanks were used for the Metal Flamingo sculpture named Elegance, which was made in 2018. Height 140 cm. and its weight is about 30 kg. An oval and thin pedestal was used in the study. In this work, the artist used domestic waste extensively. The forks used in the study are seen sequentially placed in a certain order. It is seen that the large pieces are in the body part in accordance with the center of gravity of the sculpture. Small oval-shaped metal pieces are placed on the head and neck of the statue. The use of a fork, which is a daily used kitchen tool, is seen as a reference to consumption. The sculpture, which is in the form of a flamingo animal, reminds the creatures that humans share the world they live in, and the human's point of view towards them and the responsibility that must be on them.

Conclusion

After the second half of the 20th century, problems such as climate change after global warming, forest fires, uncontrolled urbanization, destruction of agricultural lands, and new diseases have been questioned all over the world. Artists, on the other hand, did not remain indifferent to the problems that the society's consumption-oriented life and the continuous growth approaches of the economies created for the environment in which people live and started to explain environmental problems in their works (Mamur, 2017.2). While trying to liberate ourselves and expand our comfort zone, the amount of only plastic waste that enters our polluted water and air, starting with the understanding of uncontrolled consumption, reaches frightening levels. As long as our living spaces are filled with these intense unnecessary surpluses and are not questioned, future generations that should be considered are ignored. Mervan Altınorak works with waste objects in order to enlighten today's society for future generations and to question the needs. He continues to work on the story of the objects used and assigns a new task to the waste object in a new form. The waste object is included in Altınorak's work and becomes a work of art and becomes a part of upcycling.

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Student-Centered Learning: Teachers' Readiness and Challenges

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Abstract: Learning model in Kazakhstani Universities is being focused on transforming education from teacher-centered to student-centered approach. This transformation requires academic staff retraining and a significant modernization of educational process. In this article we discuss issues of methodological readiness of academic staff for student-centered learning, which has been recently implemented into the practice at the Chemistry Faculty of the Karaganda Buketov University. We have studied ways in which educators can be trained in innovative teaching methods. One of the ways is the advanced training course organized at the Karaganda Buketov University within the framework of the ENTER Erasmus+ project. We discuss the progress made by academic staff in mastering interactive lecturing, case-study, project-based learning as well as consider the problems and difficulties that teachers of the Chemistry Faculty face when organizing learning& teaching process according to the student-centered approach principles. Academic staff of four Departments of Karaganda Buketov University, namely Inorganic and Technical Chemistry, Physical and Analytical Chemistry, Organic Chemistry and Polymers, Chemical Technology and Petrochemistry Departments were involved in this study. Surveys were carried out to gain detailed information about issues considered. The findings were subsequently analyzed to provide insight on the readiness of university teachers for student-centered learning under modern conditions.

Keywords: Student-Centered Learning, Innovative Teaching Methods, ENTER Erasmus+ Project

Introduction

Student-centered learning (SCL) has received considerable attention in the world teaching practice (Aslan, S. et al., 2013). Now there is empirical evidence that the active involvement in the learning process is important. J. Barraket in a reflective case study concluded that the re-orientation of the curriculum toward student-centeredness had a positive effect on student performance, learning experience and subject evaluation. However, the analysis also found that students continued to place value on more formal teaching methods (Barraket, J., 2005). Our earlier studies also showed that application of the student-centered approach resulted in improvement in students' achievement on exams. A majority of students viewed the active learning methods positively (Sugralina L. et al., 2017).

Despite widespread use of SCL, many institutions or educators claim to be putting SCL into practice, but in reality, they are not (Lea et al., 2003). M.T. Borhan et.al. investigated readiness in implementing SCL in the Malaysian secondary school. Borhan et.al. reported that teachers were aware of SCL as an approach to motivating students to participate actively in learning and encouraging a meaningful learning process. However, the findings also indicate that the implementation of SCL in the selected secondary school is still in its infancy and that teacher-centered learning is the dominant learning style. A gradual stage-by-stage implementation of SCL in secondary school can be an alternative measure to ensure successful implementation of SCL (Borhan et al., 2020). Findings of the Erasmus+ project "Empowering teachers for a student-centered approach" performed by Irena Marinko et al. revealed that teachers and students in several European countries were acquainted with SCL to a certain degree, but they were in need of more guidance, knowledge and understanding regarding its application and practice. Shift to the SCL paradigm dictates the need for constant modernization of the educational process and involves the introduction of new teaching technologies into the teacher's methodological approach, application of innovative and original teaching methods. Some of the SCL activities include peer feedback, peer argumentation, gamification, and formative assessment, (see Latifi & Noroozi, 2021; Latifi et al., 2020, 2021; Noroozi 2018, 2022; Noroozi et al., 2016; 2020; Taghizadeh Kerman et al., 2022; Valero Haro et al., 2019; 2022). Therefore, it is important to understand the readiness of the university's teachers in Kazakhstan to implement SCL.

This paper aims to unravel the readiness of the teachers of the Chemistry Faculty of the Karaganda Buketov University to implement and adopt SCL. The findings were subsequently used to provide insight on the development of SCL in the faculty practice.

Method

This is case study research, which was carried out to understand faculty's readiness to implement SCL, particularly from the teachers' perspective. The setting of the study is the Chemistry Faculty of the Karaganda Buketov University.

In order to determine the initial level of motivation and teachers' methodical readiness to apply innovative teaching methods in the educational process, we conducted a survey of the Chemistry Faculty teaching staff in 2021-2022 academic year. We developed our own questionnaire in two training languages, which included 16 closed and open-ended questions. A total of 43 teachers that was 82% of academic staff took part in the survey. Questionnaires of the teaching staff were subjected to subsequent analysis of the data obtained.

Results

Information about Respondents

Most of the respondents, namely 79% have an academic degree and they are teachers with teaching experience from 15 to 19 years. Representatives of all four departments of the Chemistry Faculty took part in the survey. Teachers of the Department of Organic Chemistry and Polymers were the most active ones (19 persons or 44 %). At the same time, teachers in the position of associate professor showed the greatest activity.

Knowledge and Awareness on SCL

First, we wanted to find out how well teachers of the Chemistry Faculty are familiar with innovative teaching methods and how often they apply these methods in their teaching practice. According to the survey results, most of the teachers surveyed are familiar with the SCL approaches. The innovative teaching methods most mastered by teachers are presented in Table 1. They are interactive lecture, problem lecture, and work in small groups, brainstorming, project-based learning in practical and laboratory classes. Innovative teaching methods that received the least number of teachers' votes are creation of concept maps and project-based learning at lectures.

Table 1. The Innovative Teaching Methods Most Mastered by Teachers

Method	Number of respondents, persons	Percentage, %
Interactive lecture	33	76
Problem lecture	24	55
Work in small groups	24	55
Brainstorming	24	55
Project-based learning in practical and laboratory classes	28	65

A total of 27 people (63%) answered that they periodically use innovative teaching methods in the educational process, 13 people (30%) constantly use them, and 3 people (7%) completely ignore them. The assessment of methodological readiness of teachers for the practical implementation of SCL showed that 10 respondents (23%) confidently use the SCL methods in teaching, and none of the teaching staff of the Chemistry Faculty declared a complete lack of practical skills in applying innovative approaches in teaching.

To master innovative teaching technologies academic staff uses different sources of information. Internet resources & educational and methodical literature are the most popular ones. Among the main incentives for the use of innovative teaching methods in the educational process, teachers named the need for continuous improvement of students training.

Optimism towards SCL

In the process of teaching chemical disciplines, academic staff of the Chemistry Faculty prefers to use interactive lecture - 29 persons (67.4%), work in small groups - 20 persons (46.5%) and problem lecture - 16 persons (37.2%).

Table 2. Teaching Methods that are mostly used by Teachers

Method	Number of respondents, persons	Percentage, %
Interactive lecture	29	67.4
Problem lecture	16	37.2
Work in small groups	20	46.5
Case – study	10	23.2
Blitz – poll	17	39.5
Brainstorm	17	39.5
Creation of concept maps	5	11.6
Problem-based learning	14	32.5
Project-based learning at lectures	9	20.9
Project training in practical and laboratory classes	24	55.8
Innovative methods in online mode	15	34.8
Innovative methods in offline mode	20	46.5

Three teachers of the faculty, namely 7% answered that they do not use active learning methods in their teaching activities. At the same time, teachers stated the need for in-depth study of some teaching methods. The data are presented in Table 3.

Table 3. Teaching methods which demand more in-depth practice by academic staff

Method	Number of respondents, persons	Percentage, %
1	2	3
Interactive lecture	3	6.9
Problem lecture	9	20.9
Work in small groups	2	4.6
Case – study	16	37.2
Blitz – poll	7	16.2

Method	Number of respondents, persons	Percentage, %
1	2	3
Brainstorm	11	25.6
Creation of concept maps	22	51.1
Problem-based learning	10	23.2
Project-based learning at lectures	12	27.9
Project training in practical and laboratory classes	9	20.9
Innovative methods in online mode	19	44.1
Innovative methods in offline mode	15	34.8

Two teachers (4.6%) noted that they are not interested in these methods at all.

Challenges in implementing SCL

Assessing the innovative teaching methods' effectiveness for the material assimilation by students, only 5 people (12%) of the teachers surveyed consider it to be very high, while only 1 person (2%) of the interviewed teachers noted very low efficiency. The majority of respondents, namely 11 people (26%) believe that the effectiveness of students learning the material when using innovative teaching methods is average (5 points on a 10-point scale).

Teachers were also asked to describe problems that arise when implementing a SCL to teaching. Teachers' answers are given in Table 4.

Table 4. A number of problems when implementing SCL

Problem	Number of respondents, persons	Percentage, %
Students' unwillingness to take responsibility for managing projects; activities in the classroom and outside the classroom	22	51.1
Uneven assimilation of knowledge by students	17	39.5
Difficulty in assessing students' academic achievements	7	16.2
Preparing for classes requires more teachers' time	23	53.4
Noise in the classroom and chaotic organization of the learning space	1	2
Insufficient number of media facilities in the classrooms	1	2

To overcome these problems teachers suggested the following ideas:

- Informing students about the ideas behind student-centered learning – 11 persons (25.5%);
- Phased implementation of student-centered learning – 22 persons (51.1%);
- Application of various forms of stimulating students to independent learning activities – 22 persons (51.1%);
- Giving students enough time to learn at their own pace and empowering learners as mentors to peers – 11 persons (25.5%);
- Methodological assistance to teachers for the implementation of educational innovations from the faculty and the University – 14 persons (32.4%);
- Comprehensive support for the best experience in teaching for implementation of student-centered learning approaches – 21 persons (48.8%);
- Equipping classrooms with media equipment – 1 person (2%);
- Reducing the teaching load – 1 person (2%).

Discussion

Analyzing results of the teaching staff survey, it can be noted that the majority of teachers, namely 93% positively perceive the need to implement SCL approaches to the educational process. This finding is in accordance with the literature data, showing that students, teachers and educational institutions are aware of SCL benefits (Attard A. et al., 2010). Nevertheless only 30% of teachers surveyed apply innovative teaching methods regularly and 63% of teachers periodically use innovative teaching methods in the educational process. However, Bologna process implies applying SCL or its elements in most of the time and classes. Teachers usually use interactive and problem lecture, work in small groups, brainstorming and project-based learning in practical and laboratory classes. Academic staff of the Chemistry Faculty applies innovative teaching methods in the educational process along with traditional teaching methods.

At the same time, 23% of teachers evaluated their methodological readiness for the maximum score on a 5-point system, while 40% of teachers, i.e. the majority rated their readiness at 4 points. We believe that teachers who accept SCL have to work much harder to develop the knowledge and personal characteristics necessary for SCL approach. Teachers should have a considerable level of the didactic knowledge, prepare teaching and learning materials and provide e-learning possibilities. They also need to have more time for preparation for classes and possess different technical and methodological resources to implement SCL into practice. All this knowledge and qualities need further support by professional development programmes. A total of 37 % of teachers interviewed would like to take an advanced training in innovative teaching methods. Especially young teachers need more guidance, knowledge and understanding regarding SCL application and practice. Recently, distance learning has become relevant, so the fact that 44.1 % of teachers are interested in innovative teaching methods in online format is not surprising.

Young university teachers have some troubles with SCL. At the beginning of their career, academics have very little experience. Very often, young university teachers receive no training as regards the pedagogical approaches, teaching strategies, practical instructions, and the availability of learning technologies. In order to provide methodological assistance to young teachers at the Karaganda Buketov University advanced training courses were launched as a part of the international project 598506-EPP-1-2018-1-PT-EPPKA2-CBHE-JP ENTER “Pedagogical training of engineering teachers” in December 2020. More than 50 teachers of our university successfully completed these advanced training courses. In addition, the faculty of additional education functions on a permanent basis at the university, which regularly conducts teacher training courses, including those aimed at improving pedagogical skills.

Assessing the innovative teaching methods’ effectiveness for the material assimilation by students, only 12% of the teachers surveyed consider it to be very high, while only 2% of the interviewed teachers noted very low efficiency. The majority of respondents, namely 26% believe that the effectiveness of students learning the material when using innovative teaching methods is average (5 points on a 10-point scale). SCL is not without problems and it is periodically criticized (Guest R., 2005).

Teachers also noted that they faced a number of problems when implementing a SCL to teaching. Among the most important problems teachers pointed out that preparing for classes requires more teachers’ time, students don’t take responsibility for managing projects and activities inside and outside the classroom. Faculty also discussed ways how these issues could be overcome. Nevertheless, teachers of the Chemistry Faculty highlighted a number of SCL approach benefits, namely:

- Achieving a better understanding by students of what they are doing and why – 28 persons (65%)
- Development of critical thinking and creativity in students – 28 persons (65%)
- Achieving greater student activity in acquiring knowledge and skills – 24 persons (55.8%)
- Continuous professional development of academic staff – 10 persons (23.2%)

Conclusion

This research found that teachers of the Chemistry Faculty of the Karaganda Buketov University are familiar with many different aspects of SCL. However, academic staff needs to participate in professional training programmes, which will acquaint them with pedagogic and didactic issues and facilitate their personal development. The research did not investigate readiness for SCL from the student’s perspective (because this was beyond the scope of the study) but it would be useful and could show if students have the same opinion about SCL as teachers. Next, we also plan to develop a new questionnaire and conduct research in the natural sciences and humanities faculties of the Karaganda Buketov University. The obtained findings were discussed at the Academic Council of the Chemistry Faculty. It developed a number of recommendations to improve the practice of using innovative teaching methods in the Chemistry Faculty. Teachers of a modern university should follow innovative trends, constantly improve and develop. In the educational process, it is desirable to

combine passive, active and interactive teaching methods, while the choice of teaching methods should be carried out by the teacher and depend on the topic (content) of the lesson, the purpose and main objectives of training. Only continuous improvement of teaching and assessment methods will make it possible to achieve a high quality of training for graduates from multidisciplinary universities.

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Ceramic Teapots with Animal Forms

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Abstract: The terracotta animal and human figures, which are among the oldest material cultural remains in the history of humanity, indicate that people have known how to harden clay by shaping and firing it since ancient times. The first vessels produced by potters in ancient times; It was made to meet the needs of simple cooking, storage, eating and drinking. However, these vessels have diversified and taken on different forms as their needs change over time. In the Neolithic period, which is also considered as the beginning of symbolic art, especially animal figures were symbolically stylized and carved on cave walls and rocks, and then depicted on pottery with the discovery of terracotta. Over time, people started to add aesthetic and plastic values to these ceramics, which they produced to meet their basic needs. He has reached psychological saturation by enriching his work with different decors and colors. In the context of the research, animal depictions in teapot forms in ceramic art were discussed.

Keywords: Ceramic, Art, Design.

Introduction

The history of tea is much older than expected. Tea, which started to be used to treat diseases at first, has turned into a beverage that has become an indispensable part of our daily life over time. Spread to different regions such as Japan, Vietnam and India, tea reached Portugal in the 18th century. With the tea experts from China spreading and developing the tea industry in these areas and reaching Portugal after England, tea, which has now started to be consumed in Europe, has turned into a universal beverage (Gürsoy, 2005).

The containers in which this plant is consumed with different methods in different geographies also have an important place. Along with its use as a beverage, tools such as metal teapots, bamboo sticks, bombilla (silver pipette with a filter tip), gaiwan (tea cup) used in the preparation and presentation of tea began to be designed. The reason for using ceramic cups is that they absorb the flavours of the tea and result in a rich tea enjoyment in terms of preserving the taste, smell and colour.

Tea Culture in the Historical Process

Tea, which has an important place in the formation of the cultural values of the countries, has certain rules

regarding its consumption and presentation in different cultures. With these features, it turns into an artistic ritual. While in China it was a way of having a good time, it gave birth to a culture in Japan and then became a western afternoon habit. The origin of the word tea is based in China. Western European languages tea, tee, the, etc. The words are pronounced as 'ti' in the Fuji dialect. The word for tea in Turkish comes from the North Chinese pronunciation (Eberhard, 2000).

Although tea, which is among the evergreen plants in all seasons, takes the appearance of a tree when left to grow in nature, it is allowed to grow up to a maximum of one meter in gardens as it is a cultivated plant (Üstün, 2007). Although China is shown as the homeland of tea, there is no clear information on this subject. Although there is no definite information about its homeland, it is known that it is based on a very old culture. It is thought that China was the cause of Japan's introduction to tea.

Information about tea in Japan is included in the book written by Okakura Kakuzo on tea. Many books have been written on tea, and as tea spread, it brought people into contact with different religions and philosophies. Tea, which started to be produced in many places in the Asian region, comes from China; By land, it reached Asia and the Middle East by caravans via the Silk Road route, and by sea, it reached Europe and America with the commercial ships of colonial countries.

It was created by the Europeans in the 17th century for the commercial activities of the East India Companies of the Netherlands and England, as an alternative to the Silk Road trade. In this period, tea was brought to England from colonial countries with the ships of the East India Company, which had a British import monopoly, along with many exotic products. Tea, which was used as a luxury product by the elite of England until the end of the 17th century, became widespread with the increase in imports at the end of the century, turned into a popular drink by entering daily life in England and started to be consumed in the colonies of the country in America (Kuzucu, 2012).

Although tea came to our country a century later, our country is the fifth in tea production after India, China, Sri Lanka and Kenya, and the third in per capita tea consumption after England and Ireland (Tez, 2012). Tea, which has a great place and importance in our culture, has an important place in our social life as it is a must for breakfast and a beverage that accompanies conversations. Tea is consumed for pleasure in some countries, for therapeutic purposes in some countries, and for religious rituals in some countries. Tea has spread to the world, creating many cultural riches from production to consumption. This culture has become an irreplaceable value in social life. This beverage, which is the epitome of friendship and hospitality over time, is present in every moment of daily life.

Teapots with Animal Forms

Man's interest in ceramics goes back about 9 thousand years ago. The first known animal figures on ceramics are from the period called Late Neolithic; that is, it is seen 8500 years ago (Akyıldız, 1997). With the discovery

of fire, the earth was made more resistant by cooking. In addition to forms for daily use, human beings have figurines of the Mother Goddess, jewellery and ornaments, toys, etc. products are also shaped. Among the items of use, there are forms such as bowls, pots, spouted jugs, rhyton, strainer vessels, pitchers, and teapots. The teapot has an important place among ceramic usage items. The teapot came out of the Far East as a form and was carried to the West both as a part of the tea culture and as an artistic value. In this sense, ceramic teapots have diversified in terms of colour, decor and form with the effect of geography, culture and technology.

Artists in ceramic art are free as in other branches of art. Similarly, artists who produce ceramic teapots also benefit from this freedom. Today's ceramic artists can benefit from everything that surrounds them, positive or negative, during the production of works. The form used by the artists is recreated as a work designed by the artists. In the history of ceramic art, all kinds of objects in nature have been the subject of ceramic artists or pottery masters. With this view in mind, artists who produce ceramic teapots have produced works by being under the influence of the beings around them or nature and criticizing them (Er,2015). Animal depictions are one of these subjects. Many animals in nature have been models for teapots in tea culture, and artists have made descriptions for this.

Examples of how animal depictions are used, inspired by nature, are given in the teapot forms of different periods and societies below.

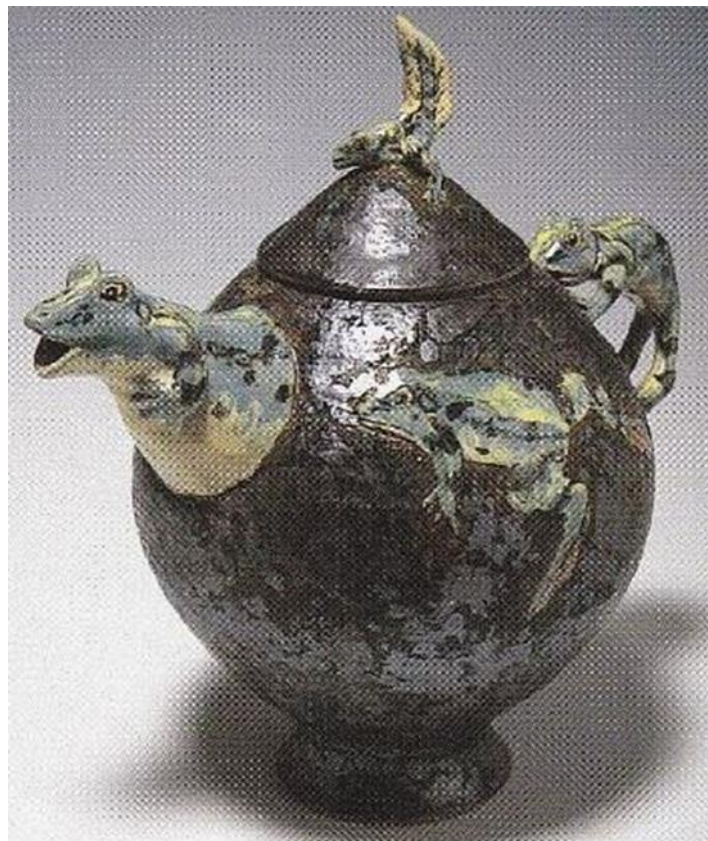


Picture 1. Ruby Red Glazed Camel Teapot

Moore Brothers Pottery, English, 1875, Height: 20.32 cm., Victoria and Albert Museum, London



Picture 2. Angela Böck “Bird Shaped Teapot With Over Glaze Decor”



Picture 3. Roger Cokcram, “Teapot with Frog”.

Height 25 cm (source: steve Woodhead, The teapot book, p. 132)



Picture 4. Andy Titcomb “Rhino teapot” height: 12.7cm, length 20.32cm, width:10.16cm



Picture 5. Mar Hernández Arnulfo el armadillo teapot



Picture 6. Ahmet Cüneyt Er "Goat Teapot



Picture 7. "Horse Shaped Teapot". 17 x 30 x 8 cm

Conclusion

Fully fulfilment of functionality and different design solutions in every period is the most basic requirement for teapot design. In addition to functionality, colour, decor and form, which will have the last word in the design, are at least as important as functionality.

Through the functional or artistic ceramic teapot form, the artist can convey all kinds of messages to the audience. With the teapot form, any subject can be the artist's means of expression. The place of ceramic teapots as a form of ceramic art has been increased by ceramicists who use them as a means of expression in every period. This is also related to the fact that an unlimited number of ceramic teapots are encountered when scanning artists and works in ceramic art.

In the research, the animal depiction in the form of a ceramic teapot was handled with selected examples and it was revealed with its aspect produced within the framework of today's art understanding.

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Picture References

Picture 1: Garth Clark, (1989). *The Eccentric Teapot*, Abbeville Press, New York, , S:67)

Picture 2: <http://www.arteskeramik.de/01.05.2011>

Picture 3: (source: steve Woodhead, *The teapot book*, p. 132)

Picture 4: <https://www.britishnoveltyteapot.com/img/wbrhino.jpg>

Picture 5: <https://www.flickr.com/photos/malota/7267013456/in/album-72157629590728590/>

Picture 6: Source: <https://www.facebook.com/A.Cuneyt.Er/photos>

Picture 7: Er,A.Cüneyt, *The Investigation of Functional Symbol Forms in Ceramics and Their Production as Plastic Forms on the Potter's Wheel*

The Role of Students' Perceived Motivation and Perceived Fairness of Peer Feedback for Learning Satisfaction in Online Learning Environments

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Abstract: In the literature, little is known regarding the role of students' perceived motivation and perceived fairness of peer feedback for their learning satisfaction, particularly in the context of argumentative essay writing in online learning environments. This study explores the effects of students' perceived motivation and perceived fairness of peer feedback on their learning satisfaction in the context of argumentative essay writing within an online learning context. In total, 135 undergraduate students from Wageningen University and research, the Netherlands participated in this study. An argumentative essay module was created and students were asked to provide peer feedback on their peers' essays. Data were collected from students about their perceived motivation, perceived fairness of peer feedback, and learning satisfaction. The results showed that students' perceived motivation and perceived fairness of peer feedback affect their learning satisfaction. This study adds to our understanding of the role of perceived motivation and perceived fairness of peer feedback in online learning environments, particularly in the context of argumentative essay writing in higher education.

Keywords: Learning Satisfaction, Online Learning, Peer Feedback, Perceived Fairness, Perceived Motivation

Introduction

Peer feedback is an effective learning strategy that can be applied for different complex learning tasks in higher education (Liu & Carless, 2006; Noroozi et al., 2021). For large-size online classes where teachers can not provide individualized feedback due to high workload, peer feedback is crucial for engaging students in the

learning processes and for active learning (Noroozi et al., 2022; Shahali Zadeh et al., 2016). Studies have shown that the use of peer feedback in online classes is increasing as the evidence has shown positive impacts of peer feedback on students' learning (Hebebcı et al., 2020; Li et al., 2010; Noroozi & Hatami, 2019), satisfaction (Xiao & Lucking, 2008), and engagement (mulder et al., 2014). Involving in a peer feedback activity provides an opportunity for students to make use of their higher-order thinking skills such as critical thinking, analysis, and evaluation (Latifi et al., 2021; Nilson, 2003). This means that students are encouraged to read their peers' work critically, analyze the work to identify the gaps and problems in their peers' work, evaluate the quality of the work, and suggest solutions for further improvements to their peers' work (Fang et al., 2021; Latifi & Noroozi, 2021). Although using peer feedback has value for online classes, its effectiveness also depends on how students perceive peer feedback (Huisman et al., 2018). Studies have shown that if students do not perceive peer feedback as a useful activity and if they do not perceive their peers as knowledgeable and reliable feedback providers, they are less likely to uptake feedback and implement it in their work (Harks et al., 2014; Noroozi & Mulder, 2017; Rakoczy et al., 2019). In addition, students' satisfaction with peer feedback plays an important role to deliver effective peer feedback (Mercader et al., 2020). If students are not satisfied with peer feedback, they might be unwilling to implement it in their work. Although prior studies have investigated the role of perceived usefulness of peer feedback in students' learning satisfaction, it does not provide enough evidence of how students' different perceptions of peer feedback including the perceived motivation of peer feedback and the perceived fairness of peer feedback influence their learning satisfaction within online learning contexts. Therefore, this study seeks to address this issue by answering the following research questions:

- RQ1. To what extent do students' perceived motivation of peer feedback affect their learning satisfaction in online learning environments?
- RQ2. To what extent do students' perceived fairness of peer feedback affect their learning satisfaction in online learning environments?

Method

Context And Participants

This research was conducted as part of a larger project at Wageningen University and research. For this study, 101 undergraduate students (female: n=70, 69%; male: n=31, 31%) from the environmental science domain participated. A module called "*argumentative essay writing*" was designed and embedded in the course on the brightspace platform. The students were required to follow the module in three weeks. In the first weeks, students were required to write an argumentative essay. In the second week, students were asked to provide feedback on two peers' argumentative essays. In the third week, students were asked to revise their original argumentative essay based on the received peer feedback and fill out the survey about their perceived motivation of peer feedback, perceived fairness of peer feedback, and learning satisfaction. To comply with ethical norms, participants were informed about the study setup of the course. The social sciences ethics committee at Wageningen University and research also gave their approval to this project.

Measurements

Students' perceived motivation of peer feedback was measured through five items (e.g., *i enjoyed giving feedback to my peers' works*). Students' perceived fairness of peer feedback was measured through four items (e.g., *the feedback i received from my peers on my argumentative essay was fair*). All items were designed based on a five-point likert scale from "strongly disagree=1," to "strongly agree=5". Items of perceived motivation and perceived fairness of peer feedback were reported to be reliable (cronbach $a=0.80$, and $a=0.76$). To assess students' learning satisfaction, a questionnaire adjusted by noroozi et al. (2017) was used. This questionnaire was made of 24 items on a five-point likert scale ranging from "almost never true=1," to "almost always true=5". The reliability coefficient was found to be high (cronbach $a=0.84$). A simple linear regression test was used to answer the research questions. In addition, the kolmogorov-smirnov test was used to determine data normality. It was determined that the data were normally distributed ($p>0.05$) after assessing the scores using the kolmogorov-smirnov tests.

Results

The results for the first research question showed that students' perceived motivation of peer feedback affects their learning satisfaction ($f(1, 77)=16.26, p<0.01, r^2=0.17$). Also, the coefficient of determination (r^2) showed that 17% of the dependent variable changes (learning satisfaction) are affected by students' perceived motivation of peer feedback.

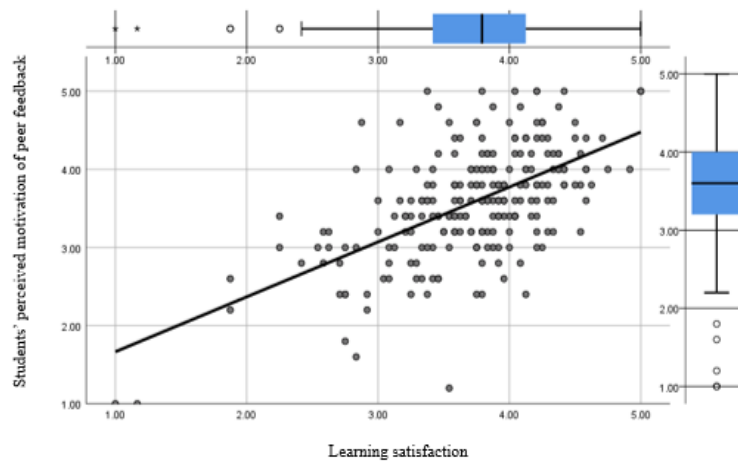


Figure 1. The Effects of Students' Perceived Motivation of Peer Feedback on Learning Satisfaction

The results for the second research question showed that students' perceived fairness of peer feedback affects learning satisfaction ($f(1, 77)=8.45, p<0.01, r^2=0.10$). Also, the coefficient of determination (r^2) showed that 10% of the dependent variable changes (learning satisfaction) are affected by students' perceived fairness of peer feedback.

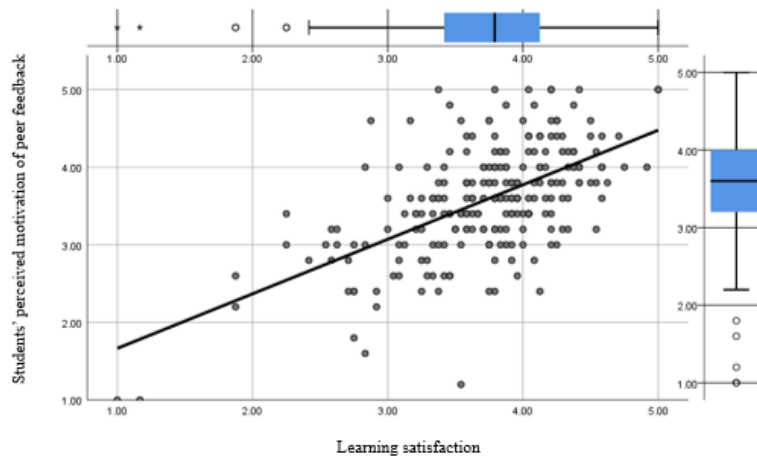


Figure 2. The Effects of Students' Perceived Fairness of Peer Feedback on Learning Satisfaction

Discussion and Conclusion

Our finding showed that learning satisfaction is affected by students' perceived motivation of peer feedback and perceived fairness of peer feedback. This means that the more students are motivated by peer feedback, and the more students perceive the received feedback as a fair critical input, the more they are expected to be satisfied with their learning. This finding is supported by some previous studies where a relationship between peer feedback, students' satisfaction, and their attitudes toward peer feedback were reported (Harks et al., 2014; Noroozi & Mulder, 2017; Rakoczy et al., 2019). One reason for such findings can be related to the fact that if the peer feedback process is enjoyable for students and motivated them, and if students think that the feedback they have received is fair, therefore they are more willing to be actively involved in the learning process and learn from peers which can result in a higher level of satisfaction. In addition, in such situations, it is expected that students feel free to provide and accept critical feedback which can lead to effective learning and high satisfaction.

This study provides insight into the role of perceived motivation and perceived fairness of peer feedback in learning satisfaction within online learning contexts. Students' satisfaction with learning through peer feedback is influenced by their perceptions of peer feedback as a motivational and fair learning activity. Therefore, teachers should consider students' perceived motivation and fairness of peer feedback before inviting them to provide feedback in order to keep students satisfied with the learning process.

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Automatism in Abstract Expressionism

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Abstract: Automatism, which is accepted as a technique by some critics and philosophers in the art world, is the unconscious automatic reflection of the unconscious on the work by the artist by focusing on a kind of trance while the work is being produced. II. The war environment of the artists who left Europe and immigrated to America during World War II caused some psychological problems that affected many parts of society. The changes felt as a natural consequence of the psychological problems caused by the psychological problems experienced have affected all kinds of environments as well as artistic formations and played a significant driving force in creating different perspectives for artists. Therefore, Abstract Expressionism, which went down in history as one of the most important modern art movements of the 20th century, came to the fore as an art movement that emerged in this period when the social and political environment was intense. In this context, it has been continued by the artists who produce works with an understanding that gives importance to revealing their own unique expressions rather than a harmonious expression language. Historically, after Expressionism, in Abstract Expressionism, pure emotions were tried to be reflected by removing the figure or abstracting it. With Abstract Expressionism, which fully overlaps with the automatism technique, pure emotion transfer has been realized by making the subconscious emotions, traumas or feelings in a state where the consciousness is closed. In the research, examples of how artists randomly reflect their subconscious on works by using Automatism were examined.

Keywords: Abstract Expressionism, Automatism, Art.

Introduction

Man is a being who has an energetic soul as well as a material body. Spirit is human existence. A person does many things in his life with his soul. Especially in psychology, the soul is used synonymously with the mental process and the psyche. The mental process includes the conscious, preconscious and unconscious of the human being. There are different levels of perception and different systems in these processes. Man thinks, decides and implements within the framework of mental processes. When approached from this point of view, it is seen that man acts with his soul rather than his body. Superficially, consciousness includes things that people do with

awareness, it includes information that can be remembered before consciousness and various information that cannot be remembered because the unconscious is limited. That's why the unconscious affects what we do in life, sometimes consciously and sometimes unconsciously. Humans store the information they perceive around them unconsciously. This information affects people's lives in various ways, psychologically and behaviorally. Affected behaviours are reflected in the actions of the person without being aware of it and without making sense of it. These effects come to our awareness through various works or sometimes spontaneously. Here, it is important to listen to oneself and face oneself.

Conscious, Unconscious and Reflections in Art

Psychoanalytic concepts are some concepts that each psychoanalyst can interpret and name differently according to his/her own theory, methods and studies. Art and mind are interconnected, a physical part of the universe and a single reality. Perceived objects are first processed by physiochemical reactions in the eye and then in the brain (Solso, 2003: 21). We can express the situations that occur in this process as the rise of consciousness. The concentration of consciousness and the subsequent phase is the processing of the unconscious. In the concentration of consciousness, the ability to think increases, sensory processes are strengthened and memory intensifies (May, 2019: 81). The artist uses the unconscious to produce creative ideas. These ideas pass from the unconscious to the conscious with the permission of the censorship mechanism. Unconscious information first becomes preconscious, then some of the censorship mechanism becomes a symbol, and some of them pass into our consciousness as they are (Lugo, 2010: 45).

Intellectual and emotional, conscious and unconscious form a complete whole in our consciousness. Intellectuality extends from emotions, thoughts, memories, and feelings in the conscious to those in the unconscious. Unconscious elements have an important place in our artistic activities as well as in our lives (Timuçin, 2017: 105-106). In artistic reflection, creation has come to the fore with the development of the unconscious. Jung stated that the unconscious and creativity are interconnected.

According to May, creativity is explained as an intense awareness and consciousness-raising. This state of intensification of awareness occurs when you are distracted, in dreams, or on unconscious levels. What is evident is that it continues at different stages of creativity without the direct control of the conscious will. In other words, the artist does not call the thoughts that come to his consciousness willingly, the thoughts come to the consciousness without his help. Therefore, an increase in awareness includes letting go of oneself, adapting to the flow, and a sudden increase in awareness in all phases of the mind, rather than being self-conscious (May, 2019: 68-69).

'Automatism' as a Concept

Automatism, as a word, is synonymous with self-movement. It can be thought of something as automatic, automatic movement, automatic, self-acting. It is "automatisme" in French and "automatism" in English:

“Automatic drawing is the act of drawing a picture or object in a hypnotic trance or distracted state. In hypnotherapy, it can be used to give the therapist access to the client's unconscious material” (Vandenbos, 2007:91).

“Automatism; In cognitive psychology, automatic information processing is generally characterized as no attention load, lack of controlled processes, lack of consciousness, parallel processes and fast execution” (Houdé Kayser, Koenig, Proust, Rastier, 2004:3) According to Sözen and Tanyeli's explanation, automatism in art is "an artistic work that does not adhere to any prejudices, principles or rules, is not controlled by the brain, and is done unconsciously and "automatically". This behaviour, created by Dadaist artists in the 1910s, was also used by Surrealists in the following years, between 1929 and 1930. (Sözen and Tanyeli, 2016: 232)

After Surrealism, Automatism started to be used by Abstract Expressionists influenced by Surrealists. The Automatism technique used in Abstract Expressionism was adapted by the artists and reflected in their art. A high focus is one of the important elements when artists apply Automatism to their paintings. When artists are fully focused (a kind of trance state), they move into the creative process, in which the unconscious is ready to extract information.

In automatism, the hand has been removed from the features that shape and form the object and has become an unconscious movement that expresses feelings and is conscious of real movement and solitude. These movements are now an intuitive, spontaneous expression that is not based on any causality and judgment, psychically and instinctively. (Sepetci, 2019: 53-54)

Automatism in Abstract Expressionism

After Surrealism, Automatism started to be used by Abstract Expressionists influenced by Surrealists. The Automatism technique used in Abstract Expressionism was adapted by the artists and reflected in their art. In automatism, the initial suspension of the conscious mind should be taken as the beginning of the creative process, not the whole. Abstract Expressionists took Automatism in this way and allowed information and images to come from the unconscious.

Since there is individualization in Abstract Expressionism, artists have produced works in different styles according to their own lives. This has led to the creation of creative works with different infrastructures, although they are in the same trend. As a result, it can be said that the Automatism technique has been applied in individual ways in art and creativity, difference and originality are felt intensely in the works.

In the research, three prominent artists from the universe of artists who produce works in the context of abstract expressionism were selected and examined as a study sample.



Image 1. Jackson Pollock, Lavender Mist, 1950

He painted the painting on the canvas he laid on the ground, by pouring, dripping, and splashing from a stick, brush or tin paint can be mixed with handmade enamel paint with different materials such as gravel, sand, and oil paint, using the movement of his hands, arms and body, as if dancing or like a ritual. is doing. For Pollock, who states that he has a way of “being” for himself and uses movement and paint as a tool in the creative process, pouring colours onto the whole canvas like a net becomes a kind of ritual (<https://www.nga.gov/collection>). The essence of human action mentioned, Pollock said, comes from the unconscious. The artist reflects the unconscious with Automatism.



Image 2. Willem de Kooning, The Excavation, 1950

It is thought that the artist was inspired by Picasso's Guernica while painting this work. It is also said to be influenced by Giuseppe de Santis' 1949 neo-realist black and white film Riso Amaro (Bitter Rice). De Kooning draws shapes and colours from everyday life. The construction pit mentioned in the title is a common sight in New York. The painting makes us think that it witnessed a historical human disaster and what the artist did was to remove it (Hess, Grosenick, 2005: 48).



Image 1. Franz Kline, Chief, 1950

It is said that the dark side of Franz Kline is reflected in his paintings as black and white as emptiness. From a different point of view, black and white can be interpreted as the persona and main personality of the artist. When we go down to the deeper meaning of the work, it should be taken into account that the artist had a traumatic childhood. The death of his father and the feeling of being alone in the school he was sent to, the harsh education at the school as well as the fatherlessness, the tense atmosphere and the fact that all the children there are orphans are enough for the artist to be an introvert. It is thought that the use of only black and white in Abstract Expressionist paintings after 1950 is related to expressing his feelings not with colour but with movement.

Conclusion

The unconscious in art contains the information that artists reflect in their paintings without their awareness. Abstract Expressionist artists have reflected unconscious effects on their works by using some techniques in the process of reflecting their inner world. As a result, in the analyzed works of the three artists who were taken as samples among the abstract expressionist artists, the lives, traumas and primitive impulses of the artists, that is,


these unconscious effects, are censored, forgotten, and unable or difficult to reach the level of consciousness, with the Automatism technique, the relaxation of the censorship mechanism and the release of the unconscious. It can be said that the knowledge that is present in the world is reflected in his works.

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Gender Effect on The Professional Integration and Remuneration of Tunisian Young Higher Education Graduates

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Abstract: In Tunisia, the problem of the professional integration of higher education graduates has persisted since the 1990s. A survey was developed among graduates to determine the indicators and determinants of unemployment among young graduates as part of the quality support program initiated by the World Bank. In this context, we compared the graduates' perceptions of agricultural engineers and licensed students in economic and managerial sciences about the entrepreneurial skills needed for employment and their evaluation of the corresponding academic programs. The survey analysis result indicates that unemployment affects girls much more, especially undergraduates. Significant gender differences were observed both in waiting time to get the first job and in remuneration, mainly for agronomic engineers. Engineer perceptions for entrepreneurship skills were significantly higher, revealing poor academic performances in this issue. Reform of the studying program integrating entrepreneurship, technology, critical thinking, and soft skills is an urgent issue to enhance the attractiveness of the agronomic institutes and increase youth engagement in the agronomic pathway.

Keywords: Gender, Agronomic Engineers, Entrepreneurship Skills

Introduction

Issues related to young university graduate employment are of concern in the current challenging socio-economic environment and massification of higher education because high unemployment rates of university

graduates were reported increasingly in many developed and developing countries (Wu, 2011; Xing et al., 2017; Esposito and Scicchitano 2022).

In Tunisia, estimated at 30.1% in 2020, the unemployment rate is 1.6 times higher than at the national level (INS, 2021). Engineer students, studying for two supplemental years compared to bachelors, represent 15% of the total regular students (MERS, 2021). Their labor market integrations are supposed to be easy and immediate. Therefore, they are less affected by unemployment when compared to their counterparts with other degrees. However, of all engineers, unemployment is more prevalent among agriculturalists (ONEQ, 2015). This situation affected the attractiveness of their corresponding academic institutes. Indeed, the total number of regular students in Tunisian agronomic engineering institutes has lost 20% of the total headcount during the last decade (ONAGRI, 2018). The unemployment rate is even higher for the Tunisian license graduates (Céreq, 2015). This conjecture situation emphasizes the failure of the educational system in preparing students to face workplaces in ever-changing industries and socio-economic environments, as explained by Aziz et al. (2016). Griffin and Annulis (2013) reported that the most common employer complaints turned around the lack of decision-making, problem-solving, teamwork, and self-learning skills by graduates. Misni et al. (2020) suggested that universities must realize that employability skills are not limited to securing a job but must also help graduates succeed in their work, and this could be achieved by understanding the demanded skills that employers require.

On the national scale, and besides unemployment problems, interest has risen in increasing gender gaps. The unemployment rate is superior for women, estimated at 40.7% versus 17.6 % for men (INS, 2021), although they represent 66% of the total regular registered students in 2020 (MERS, 2021). However, gender gaps in employment could differ according to sector activities and degree types of graduates (Oh and Lewis, 2011; Pullman, 2018; Jehn et al., 2019; Galperin and Arcidiacono, 2021). It is important to note that males and females perform differently in classrooms as well (see Banihashem et al., 2021; Noroozi et al., 2020; 2022). For engineers, female students represent 43% and two-thirds of the students in the agronomic field (ONEQ, 2015; MESRS, 2021). Paradoxically, field surveys reported that gender employment gaps were more severe in the agronomic sector to the disadvantage of women (ONEQ, 2015). This situation is also persisting on the international scale and has scarcely changed on the aggregate level over the last 15 years (OECD, 2017).

In this context, entrepreneurship training is gaining more and more ground to prepare students for self-employment (Premand et al., 2012; Jumana, 2019). Additionally, the tutelage authorities had initiated a debate on the reform of the Tunisian university agronomic system education and its restoration of attractiveness. Therefore, exploring the agronomic graduates' perceptions about entrepreneurship skills and their academic program adequacy with the labor market could enlighten specific education system deficiencies and help decision-makers adopt appropriate reform strategies. A comparison analysis about the importance of entrepreneurship skills to get a job between agronomic engineer perceptions and licensed students whose academic background is rich in entrepreneurship concepts could also bring more understanding of the situation.

In this context, this work is motivated by two objectives. First, it targets quantifying the gender gaps in the employment process for both degree types. Secondly, it aims to explore perception discrepancies related to the evaluations of the academic program and the importance of entrepreneurship skills between horticulture agronomic engineers and undergraduate students in economics, management, and marketing.

Methodology

The database used in this work is developed through an online survey for 2016-2020 Tunisian graduates of the High Agronomic Institute of Chott Mariem (ISA CM) and the Faculty of Economics and Management of Nabeul (FSEGN). The survey application link was repeatedly sent to graduates, using their last email given by the institute administrations, for a period of 3 months going from May to July of 2021 for undergraduates for all specialties for FSEGN and from October to December 2021 for all ISA CM agronomic engineers specializing in horticulture. These surveys campaigns were carried out for the first time in these two academic institutes as a part of their quality improvement process. ISA CM students' study for five years to get an agronomic engineering degree. However, FSEGN students spend only three years to get a degree in economics, management, or marketing. The rate of female representation, in these two institutes, is the same representing about 78% for the 2016-2020 period, which is higher than the national level.

The survey covered many topics like the actual professional situation, the first job remuneration, the waiting time to get the first job, the perceptions about the importance of generic and technical competencies for professional integration, and the perceptions about the academic program adequacy to the labor market. The perceptions were measured with a Likert scale from a negative perception of 1 to a positive one of 4.

100 and 379 fresh graduates participated in the survey for ISA CM and FSEGT, respectively. 299 and 94 responses were selected for statistical analysis after eliminating the responses with many missing values. The corresponding participatory rates of the target communities were 19% and 74%, respectively. The levels of women's responses were 75% and 73% for ISA CM and FSEGN institutes, respectively, which is close to their representativeness.

Chi-square test of independence and logistic binary regressions were used as statistical test analysis for gender and degree types' effect assessments and perceptions discrepancies.

Results

Gender Employment Gaps

The unemployment rate is close to 40% and 50% for agronomic engineers and licensed students of FSEGN, respectively (see Figure 4). The employment rate of men graduates represented 65 and 63% of the total men respondents for ISA CM and FSEGN, respectively. This rate was 60 and 49% for women respondents,

respectively (see Figure 4). The data analysis also reveals that the gender effect was significant for FSEGN (p value=0.043) and not significant for ISACM (p value=0.717).

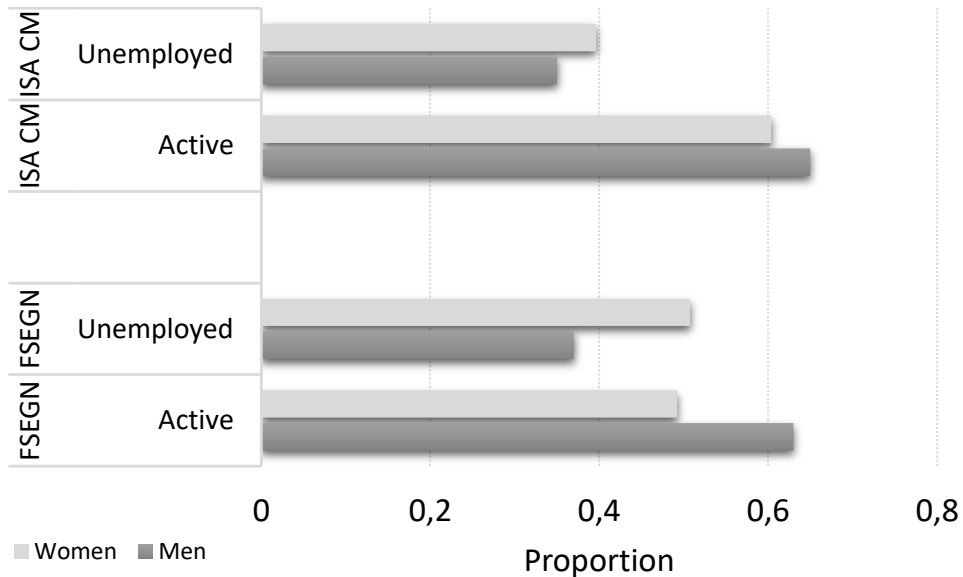


Figure 4. Unemployed And Active Graduates' Proportions Represented by Gender and Institutes

The middling period of waiting to be integrated into professional activities after graduating was estimated by a weighted average according to classes proportions presented in Figure 5. For the class corresponding to a waiting period of more than one year, the value considered was 15 months. The results showed that ISA CM women horticulture engineers were the most disadvantaged category regarding waiting time to be hired. These average periods for women and men were about 4 and 4.2 months, respectively, for the bachelors of FSEGN. They were about 8 and 4.5 months, respectively, for the engineers of ISA CM.

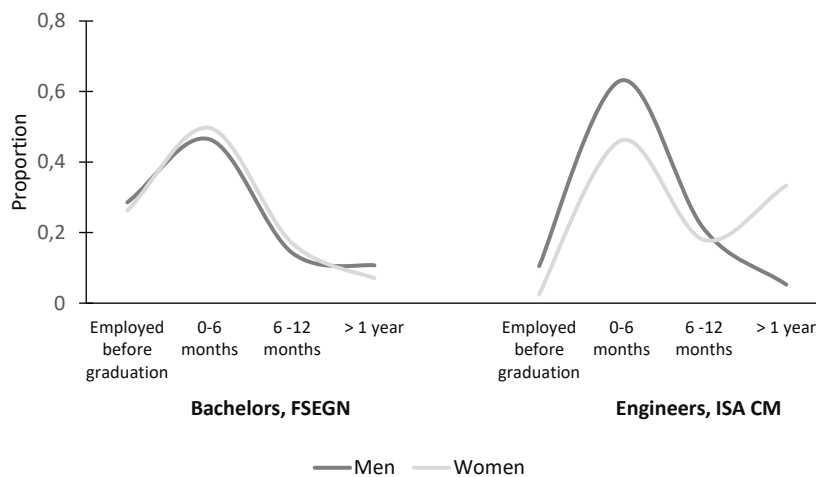


Figure 5. Density Curve of Distributions of Waiting Time to Get the First Job of Respondents by Institutes and Gender

The average first remuneration was estimated in Tunisian dinars (1\$=3,003DT according to the Central Bank of Tunisia on 7 April 2022) by a weighted average according to the proportions of the classes presented in Figure. The value considered for the class corresponding to remuneration higher than 1500 TD was 1750 TD. Results showed that women horticultural engineers at ISA CM were, once again, the most underprivileged in terms of the first pay scale. The average remunerations for women and men were about 691 and 910 DT, respectively, for the licensed students of FSEGN. They were about 654 and 704 DT, respectively, for the engineers of ISA CM.

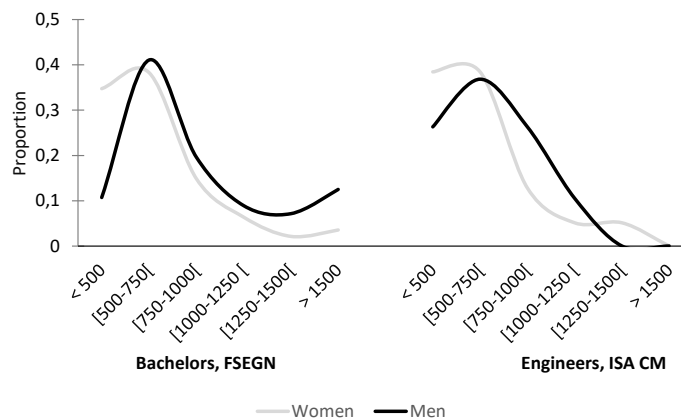


Figure 3. Density Curve of Distributions of The First Remuneration of Respondents by Institutes and Gender

Graduates Perceptions

The score levels of the student perceptions related to academic curriculum adequacy with the labor market requirement were similar between the two institutions and the lowest compared to the other scores for both institutions (see Table 1). Among entrepreneurship skills perceptions, communication skills were highly scored, whereas awareness of societal values had the lowest scoring for both institutes. ISA CM engineers gave more importance to technical skills, cross-culturally ability, and entrepreneurship skills, than the licensed students of FSEGN. These results were consistent with the binary logistic regressions (see Table 2). According to academic institutes (ISA CM vs FSEGN), the odds ratios of the perception scores were significantly superior to one.

Table 1. Means And Standard Deviation (SD) Of Graduates' Perception Scores for The Two Academic Institutes

Topics	Perceptions	FSEGN		ISA CM	
		Mean	SD	Mean	SD
Academic program adequacy	Recognition of degree in market job	2.82	0.86	2.73	0.88
	Adequacy of the theoretical training	2.73	0.82	2.81	0.83
	Adequacy of the practical training	2.55	0.88	2.52	0.86
Technical skills and	Ability to mobilize knowledge	3.07	0.74	3.35	0.67

Topics	Perceptions	FSEGN		ISA CM	
		Mean	SD	Mean	SD
cross-culturally ability	Methods and tools expertise	3.20	0.80	3.49	0.62
	Ability to work in an international context	3.00	0.88	3.38	0.67
Entrepreneurship skills	Project management	3.10	0.84	3.62	0.57
	Communication skills	3.54	0.70	3.72	0.52
	Ability to solve problems	3.46	0.67	3.64	0.50
	Working in teams	3.49	0.68	3.60	0.55
	Leadership	3.29	0.74	3.59	0.58
	Sense of initiative and creativity	3.30	0.75	3.61	0.57
	Ability to identify training needs	3.17	0.70	3.40	0.66
	Language skills	3.35	0.77	3.55	0.58
	Awareness of societal values	3.04	0.77	3.36	0.65

Higher odds ratios between ISA CM engineers and FSEGN graduate students are noticed for entrepreneurial skills than for technical skills and cross-culturally ability (see Table 2).

Table 2: Odds Ratio of The Binary Logistic Regression Depending on Institute and Gender

Topics	Student perceptions	Odds Ratio	Odds Ratio
		ISACM/FSEGN	Male/Female
Academic program adequacy	Recognition of degree in market job	0.70	0.74
	Adequacy of the theoretical training	1.40	0.60
	Adequacy of the practical training	0.90	0.80
Technical skills and cross-culturally ability	Ability to mobilize knowledge	5.54**	0.97
	Methods and tools expertise	5.16**	0.52
	Ability to work in an international context	5.95**	0.88
Entrepreneurship skills	Project management	22.21**	0.58
	Communication skills	4.15*	0.55
	Ability to identify training needs	4.73*	0.82
	Ability to solve problems	4.29*	1.78
	Working in teams	2.13	1.74
	Leadership	7.22**	0.62
	Sense of initiative and creativity	8.24**	0.84
	Language skills	3.63*	0.33*
Awareness of societal values	6.48**	0.37*	

** Significant to 1%, *significant to 5%.

Among the entrepreneurial skills, perceptions of the importance of project management, initiative and creativity, and leadership skills showed the highest odds ratio between the two groups of graduates. Gender discrepancies perceptions were only significant for languages skills and awareness of societal values. The odds ratios (male vs female) were significantly inferior to one attesting that men give less importance to these generic skills than women do.

Discussion

Although the results did not show a significant gender difference in the hiring rate of agricultural engineers, discrimination in salaries and the waiting time to be recruited were noticeable. These results are consistent with assertions in the published literature about gender discrimination (Boye et al., 2017; Shor et al., 2019; Matteazzi, 2020). The still conservative rural Tunisian environment, in favor of qualified men, is one of the barriers facing women in agriculture engineering to get an immediate job unless they consent to underpayment. Lack of high remuneration opportunities in agriculture employment sectors repulses male students in agronomic studying engagement. Indeed, the first wages of engineers were 23% lower than licensed students when comparing male university groups, despite the two additional years of study for engineers.

The persistently high unemployment rate of agronomic engineers could be related to the difficulties of the public sector to absorb the graduates (Grundke and Goldstein, 2022) and the discordance of university education with the agricultural profession (Agili, 2020). These unemployment causes were also reported in many other countries (Mirakzadeh and Ghiasv, 2011; Odongo et al., 2017).

Overall unsatisfied with their level of study, fresh graduates evaluated severely their academic program's adequacies to the employment market requirement. The contrasting high score perceptions related to the importance of technical and entrepreneurial skills for market labor reveal poor academic performances (see Farrokhnia et al., 2022). For needed competencies, placed at the first level for both institutes, communication skills seemed to be the most lacking skills for all the graduates. Engineering academic programs are more focused on technical skills, and less on entrepreneurial skills, unlike the licensed graduates in marketing, managerial and economic sciences, which increase the engineer perception scores of the importance of these skills in being hired. Among entrepreneurship skills perceptions, project management is the most discriminant given the desire of most engineers to succeed in self-employment projects and avoid jobless in the current economic Tunisian crisis characterized by the recruitment standstill in the public sector. Leadership skills and a sense of initiative and creativity also segregated the two categories of graduate perceptions, which reveal a greater eagerness of agricultural engineers to modernize their education programs by centering on courses that foster their creativity and critical thinking.

Female and male perceptions are expressed similarly for almost all the needed competencies except for language skills and awareness of societal values. Social engagement could positively influence the employer's hiring decision (Heinz, 2017) and female graduates were more aware of that. For language skills, women were more perceptive to these generic competencies in Tunisia, where gendering the French language was frequently reported (Walters, 2011).

Conclusion

Enduring high levels of unemployment and rare opportunities to be well-remunerated for their first job, agronomic engineering and licensed economic and managerial students had low regard for their academic programs and recognition of their diploma in the labor market. These negative perceptions are at the heart of the decline in the attractiveness of higher education. Fresh graduates are demanding modernizing their studying programs by incorporating entrepreneurship, technology, critical thinking, and soft skills. Agronomic engineers are more eager for entrepreneurship skills integration in their academic programs. Presently, accelerating the reform process of the academic program is an urgent issue to enhance the attractiveness of the agronomic institutes and increase youth engagement in the agronomic pathway.

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What ICT Teachers Think About Their Profession and the Course They Teach: A Case Study

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Abstract: The purpose of this research is to investigate ICT teachers' opinions about current and future status of their profession and the ICT course they are teaching in Turkey. It was carried out based on the case study approach within the qualitative research context. Using a convenience sampling method, the participants were made up of 10 ICT teachers selected on a voluntary basis from the "Informatics Teachers Platform" group on Facebook. Data were collected through semi-structured interviews and analyzed using descriptive content analysis. According to the findings, participating ICT teachers think that they are seen as technical staff and thus they are not given sufficient and necessary value. This causes professional anxiety among the participants. They find the current ICT course insufficient in terms of content and quantity and consider an update on these issues. Some also worry that the course will lose its importance in the future. Moreover, they think that the role of ICT teachers in the context of technology integration in education is not given enough importance.

Keywords: ICT teachers, Opinions, Profession, Case study

Introduction

Over the years, there have been many political and practical changes made in the Turkish educational system about teaching children information and communication technologies (ICT) in terms of related course's name, credit, curriculum, textbooks and teachers. In addition to the reasons for the changes made in education, it is also important how the practitioners feel about and responds to these changes and specifically how these changes affect their professional identity. Recent studies shows that political changes affect the emotional status of teachers and they might have feelings of anger, sadness, boredom, desperation, insurgence, disappointment, pessimism and burn out. (Köysüren & Deryakulu, 2017). In fact, such feelings may result in disruptive consequences on their professional identity and behaviors.

Emerging on social identity studies, professional identity is generally known as a conscious awareness of oneself as a worker and it has three dimensions: how much one cares about his/her professional roles (centrality), how interesting he/she finds them (value), and how compatible he/she views them with his/her other roles (consonance) (Moore & Hofman, 1988). Likewise, Kelchtermans (1993) states that professional identity has five dimensions: self-image, self-esteem, work motivation, task perception and future perspective. Professional identity is known as one of the important factors affecting many worker behaviors such as job satisfaction, dedication, burnout, desire to continue the profession and coping with changes (Day & Sachs, 2004).

Knowles (1992) identified the professional identity of teachers as the images and concepts that teachers have about themselves. On the other hand, Beijaard, Meijer and Verloop (2004) recognized the sum of other people's expectations and ideas, perceptions of the concept of teacher and its roles in society, and the characteristics teachers attach importance to in their professional life. As aforementioned as an effect of professional identity, teachers' perception about their profession has an impact on their teaching methods, the way they develop themselves, and their attitudes towards educational changes (Volkman & Anderson, 1998).

The review of the related literature suggests that many empirical studies approached important factors in constructing teacher professional identity with specific lenses (Hsieh, 2010). One group of studies examines the importance of personal factors such as emotional experiences of learning and teaching and self-image (description of individual characteristics). The second group of studies focuses on the context of teacher education programs including establishing and promoting aspects of being a "teacher", conceptualizing curriculum and instruction and pre-service teaching experiences. One another group highlights the importance of site/school context consisting of classroom practices (instructional design, teacher-student relationships etc.) and colleague and administrative staff relations. The last group of studies emphasizes external factors such as theoretical and empirical works, state and national policies, and reform initiatives and changes. According to Day, Kington, Stobart, and Sammons (2006), emotional feelings have also forming effect on teacher professional identity.

Since the target population of this study includes ICT teachers, it is necessary to share brief background information and historical development of these teachers in Turkey. The Departments of Computer Education and Instructional Technologies (CEIT) were established in 1998 in higher education. These departments have been offering pre-service education to train ICT teachers. Ministry of Education assigns as many as needed among graduates to public schools. Since 2013, they have been teaching "Information Technology and Software" course in 5th and 6th grade as a compulsory course and 7th and 8th grade as a selective course. A plenty of regulations/changes have been performed by Ministry of National Education over years regarding the title of the IT courses, course hours, grade levels, status of the course as elective or compulsory, curriculum and resources. Additionally, ICT teachers were assigned with various duties and responsibilities as a result of a need of working staff guiding technology use in education. They are responsible for teaching students IT knowledge and skills, leading technology integration in the schools, helping teachers use educational technologies, being a

model for the ethical use of technology and keeping technical tools working properly (Çakır, Çebi & Özcan, 2013). They experience problems about the changes and regulations germane to their occupation. Review of previous research indicates several factors affecting them negatively such as increasing work-overload coming with reforms and changes, vague job definition, varying perception of others about them and their course, technical problems in ICT labs, inefficiency of the curriculum, problems in teacher education (Köysüren & Deryakulu, 2017). Of course these factors may eventually bring about emotional burnout as well as occupational stress impacting their professional identity. Therefore it is important to examine their perspectives towards teaching profession. In this manner, this study aimed to investigate ICT teachers' feelings and opinions about current and future status of their profession and the ICT courses they are teaching.

Method

This study was designed as a case study within the qualitative research paradigm. Case study is known as a detailed study of a specific subject, such as a person, group, place, event, organization, or phenomenon. It helps to understand situations resulting from a new policy initiative or service development (Yin, 2009). Therefore, such an approach was suitable for the aforesaid specific purpose of examining feelings and opinions of ICT teachers about their profession.

Using a convenience sampling, the participants were made up of 10 ICT teachers selected on a voluntary basis from the "Informatics Teachers Platform" group on Facebook. Of the participants, 7 were male and 3 were female. They have been working in junior high schools (5-8 grades) with teaching experience between 2-11 years. Semi-structured interviews were conducted to collect the data. Due to the COVID lockdown situation, the researchers could not meet face-to-face but rather they sent participants interview questions and asked them to return with their written answers. An inductive data analysis procedure was employed. The researchers first carefully read interview transcripts to allow participant's opinions to emerge from the data. Then they identified significant statements and coded them by suitable and meaningful concepts. After that, they determined which codes could create categories through sorting and combining. Finally, they generated the major themes under which findings were presented. The followings were the framing interview questions:

- What are your feelings about your occupation as an ICT teacher?
- Do you have concerns about the future of your profession?
- Do you think that ICT teachers are given sufficient value?
- How do you see your role in technology use in education?
- What do you think about the curriculum of the courses you are teaching?

Results

The first theme was named as "perceived themselves as technical staff". Most of the participants (80%) think that they are seen as technical staff by others in the schools. Of these, 80% are uncomfortable with this situation

whereas 20% state that they are not bothered. Some representative comments include:

“The task of ICT teachers is to teach their students IT. Having a good command of technology and problem-solving skills should not make them technical service.”

“I think we are seen as technical staff. Perhaps, we are seen as such because we have more technological knowledge than other teachers but this undermines our status.”

“...I am not really bothered about this issue because I like to spend time with computers.”

The second theme was named as “difficulties of ICT teachers”. The majority of the participants (90%) think that ICT teaching is not a comfortable profession or even a difficult branch. Some comments related to this theme include:

“It is not a comfortable profession. The fact that some teachers allow children to play games in class degrades the value of our profession.”

“We are a more difficult branch than other branches because we need to constantly improve ourselves and we always deal with technical problems.”

“We are in the age of informatics and informatics teachers have a lot of work to do, so I think it is wrong to consider it as a comfortable profession.”

The third theme was named as “under appreciation”. All participants think that ICT teachers are not given the value they deserve. Their comments were aligned with the notions of value and importance:

“I don’t think it is given much value on the basis of public schools and there really doesn’t seem to be much expectation. But if we look at private schools, ICT teachers are expected to constantly produce something, and as such, it improves the teacher. This increases the value of our teachers. We must also do our best, learn new things and pass them to our students so that our value is better understood.”

“If importance was given to us, the number of appointments would increase and informatics laboratories would be established in every school.”

The fourth theme was named as “role in technology integration”. Half of participants think that their assigned role and authority in technology integration in education is insufficient. Representative comments for this theme include:

“I think that we should be the leader in this regard, but I do not think that the authority given to us is sufficient.”

“We need to be the leading branch in this regard and I am not satisfied with the position of our role.”

“I can say that mostly the administration is planning something and if they can’t get out of the way, they consult me.”

The final theme was named as “the status of IT curriculum”. Most of the participant teachers (80%) do not find the course hours sufficient. Some of them elaborated their opinions as follows:

“I do not find the lecture hours sufficient. I think that at least 2 lesson hours should be extended.”

“I think that the lesson hours are few and insufficient. In my opinion, courses should be added

gradually for 4 hours in the 5th, 6th and 7th grades, and 2 hours in each of the 2nd, 3rd and 4th grades.”
“Coding education should be started from younger age thus ICT courses should be started in primary schools. We should do this if we want a youth that produces our own national technology”

A little more than half of the participants (60%) are not satisfied with the curriculum’s current state. Representative comments on this issue included:

“Our curriculum needs updating. In particular, I think that robotics and coding should be more emphasized.”

“There is too much verbal content, programming and project work can be increased”

“I am not satisfied with the curriculum; I think it is an outdated program. It should be updated and developed according to the present”

Almost half of the participants have concerns about the importance of IT course. The following are the sample comments on this issue:

“I do not think that the IT course is given enough importance and that it has a future because there are no questions in the university exams.”

“I think that this course will be removed from the school curriculum and it will be given in a place independent from the school.”

“I am worried now, but I think the value of the information technologies course will increase in the coming years.”

Conclusion

This study shows that participating ICT teachers are quite worried about the future of both their profession and curriculum of the courses they taught. They expect that their role in technology integration or digital transformation in teaching and learning in the schools is appreciated. They do not want to be seen as pure technical personnel in the schools. They want to fulfill their professions in a more esteemed, valuable and trouble-free way and that they desire to feel themselves as teacher. Therefore this research suggests that necessary support should be provided to overcome negative emotions of ICT teachers as well as to prevent their possible disruptive consequences on teachers’ professional identity.

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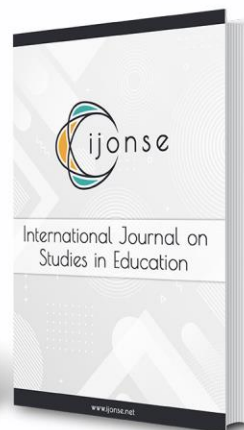
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