

MULTIDISCIPLINARY PERSPECTIVES IN EDUCATIONAL AND SOCIAL SCIENCES V

EDITOR

Mustafa KAHYAOĞLU

AUTHORS

Atikullah GHIASEE

Berrin GÜNER

Can MAVRUK

Ecaterina KORSHKOV

Gulamhuseyn MAMMADOV

Halil KÜÇÜKLER

Nihat BOZ

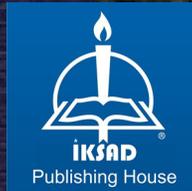
Nimet AKBEN

Nuri KARAKAŞ

Nurullah ŞİMŞEK

Selma ATABEY

Özen ARLI KÜÇÜKOSMANOĞLU



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PREFACE

Today, in parallel with technological developments, tools that make people's lives easier have emerged. Internet is one of the technological developments that makes communication between people faster. Depending on the developments in internet technology, people have the opportunity to communicate more easily with other people and share their ideas and opinions. Social media is one of the most used tools in communication processes over the internet. YouTube, instagram, facebook, twitter and Linkedin are the most used social media applications. Accordingly, it is very important to reveal the relationships between social media addiction of young people and loneliness, social appearance and anxiety. You can find detailed information on this subject in the section on the relationship between social media addiction and loneliness, social appearance and anxiety in young people.

The virus, also known as Covid 19, which spread to the world in a very short time and turned into a pandemic, has caused the fear of infection in people all over the world. The impact of Covid-19 and its new variants on people's resilience is a subject worth examining. The mediating effect of fear of Covid-19 on psychological resilience and psychological well-being and psychological disorders is presented in the relevant section. If students with high-level thinking skills are to be trained in courses such as science and mathematics, there is a need for teaching methods that will develop high-level thinking skills instead of rote-based practices. At this stage, it is necessary to reveal the appropriateness of the question types presented to the students in the courses where mental activities such as science and mathematics are at the forefront. Therefore, examining the question types used in science teaching may be useful in explaining this issue.

English language teaching is another important issue. English language education is very important in communicating with people all over the world. All developed countries are trying to teach English to their people. Therefore, presenting informal teaching approaches in English language teaching can be quite interesting for readers. However, tourism is a very important issue for our country. Again, the Cappadocia region is a very important region for adventure and balloon tourism. In the relevant section, the personality traits of the tourists participating in balloon tourism in the Cappadocia region were examined in detail according to the structural equation model. In yet another chapter, the ideological foundations of the Bolshevik support and the committees established in Anatolia during the national struggle in Turkey

were examined. In another section, the psychometric properties of the ones that should be included in a test to measure pedagogical content knowledge skills are presented. Coastal areas are important and vital areas in human life. More than 60% of the world's population lives here. They are very important regions for trade and industry. Therefore, the management of coastal areas from data to information is very important. In the relevant section, theoretical information on this subject is presented.

We would like to thank the valuable researchers who contributed to the preparation of the book and ISPEC publishing, which played a great role in the publication of the book.

Prof. Dr. Mustafa KAHYAOĞLU
October / 2022

CHAPTER 1

**PROBLEM TYPES AND SCIENTIFIC METHOD IN
TEACHING SCIENCE: THE EXAMPLE OF A CHEMISTRY
AND PHYSICS LESSON**

Assoc. Prof. Dr. Nimet AKBEN¹

¹ Ankara University, Faculty of Educational Sciences, Department of Elementary Education.
Ankara, TURKEY. E-mail: nakben@ankara.edu.tr. ORCID ID: 0000-0002-2346-0494

INTRODUCTION

1. WHAT IS A PROBLEM?

- If Adam has 300 TRY and saves 30% of his money, how many kilos of oranges and apples can he buy if oranges cost 5 TRY per kilo and apples cost 7 TRY per kilo?
- What is the density value of a substance which has a mass of 13.5gr and volume of 5cm³ and which substance could this density value belong to?
- Increased environmental pollution
- Millions of lives are lost due to the contagious Coronavirus disease (COVID-19) caused by the SARS-CoV-2 virus.

If each of the above listed situations are considered as a problem; in its simplest form, a problem can be defined as “every situation that creates difficulties for the person, whose answer is unknown and awaits a solution”. Many sources provide a definition for what is a problem, and some examples are given below:

- A question or issue to be solved based on theorems or rules (TDK, 2021),
- A situation which requires a solution or requires to be revealed, but in which the path to the solution is not clear (Grouws, 1996),
- Not knowing what actions to take in a particular situation (Robertson, 2001).

In addition, however, it can be said that the concepts of ‘question’, ‘exercise’ and ‘problem’ are often used interchangeably and are not necessarily considered completely distinct from each other (Aşıcı, 2020). While the concept of ‘question’ is defined as situations that can be solved by recalling previous information, the concept of ‘exercise’ can be explained as an application to reinforce a previously learned skill or algorithm. On the other hand, ‘problem’ includes situations that require the synthesis of previous knowledge (Krulik and Rudnick, 1988). Although these concepts should not be considered completely separate from each other, the small differences between them are significant and play an active role in the cognitive and metacognitive development of students. For example, in science lessons such as physics or chemistry, exercises with algorithm content are frequently used and it is known that these are questions that can be answered with minimum

effort (Harren, 1996). It is accepted by all educators that these exercises, which are frequently preferred due to their advantages of being easy to prepare and able to quickly be assessed, achieve solutions in a shorter time and lead students to memorisation. In these exercise-type questions, students can easily reach a solution by placing the given values into formulas they have memorised. However, it is not possible to consider these exercises, which are simply an application of algorithms, as a problem or to consider that students have solved a problem with this method. For this reason, it cannot be said that students' success in problem solving skills have been measured in test type exams, despite these students having shown a high performance in these exams (Nakiboğlu and Kalın, 2003). If the aim is to develop students' high-level thinking skills in subjects such as science and mathematics, it is clear that such rote-learning based applications do not serve this purpose. This situation brings to question the types of problems which exist in the disciplines of science and mathematics.

1.1. Problem Types in Math Lessons

An investigation of the types of problems used in mathematics shows that there are different classifications. Charles and Lester (1982) grouped the types of problems under six headings. The following information briefly explains the findings reached in regard to these headings.

- Exercises are types of problems that enable students to develop and become experienced in the basic operations by applying various algorithms.
- Simple transformational problems are those that involve verbal expressions translated into mathematical language. These problems, which are frequently seen in textbooks, help students to develop their understanding of mathematical concepts.
- Complex transformational problems differ from simple transformational problems in that they require at least a two-step process.
- Process problems, unlike the types described above, include processes such as planning, estimation, assumption, finding patterns, which are required in problem solving activities. In doing so, it helps to develop strategies for understanding, planning and solving the problem.

- Applied problems are problems that involve real-life situations and require the use of mathematical skills, concepts and operations for their solution.
- Puzzle problems are based on combining objects in different combinations to form a whole. It is a type of problem that is not always solely about mathematics, but can be solved with unconventional methods and is often fun.
- On the other hand, Jonassen (1997, pp.67-68) categorises problems in three main headings: structured, unstructured and puzzles.
- Structured problems are problems that contain all components of the problem and have a single correct answer, with a single solution.
- Unstructured problems are types of problems that are not completely defined, have more than one solution, or do not have a definite solution.
- In addition to the classifications mentioned above, mathematical problems are also commonly grouped as routine and non-routine problems (Altun, 2000).
- Routine problems include the four operations and can be solved with one or more steps. These types of problems, also called verbal problems, are commonly found in textbooks and frequently used by the teachers during lessons.
- Non-routine problems are also called real life problems because they represent a situation that is possible to encountered in real life. In order to find the solution in such problems, high-level cognitive skills such as organising information, classifying and being able to see the relationship between information is needed.

Apart from the mentioned problem types, it is seen in the literature that problems are often classified as standard and non-standard problems, taking into account the skills required for the solution (Aşıcı, 2020). The problems defined as standard in this classification are routine, and non-standard problems have the characteristic of being non-routine problem types. In this regard, the first three problem types given by Charles and Lester (1982) can be considered as standard problems, and the others as non-standard problems. Furthermore, when taking all classifications into account, it is apparent that cognitive skills such as knowing and applying the solution of standard or routine problems are required while metacognitive skills are required for non-standard or non-routine problems (Aşıcı, 2020).

2.2. Problem Types on Science Lessons

It is seen that the types of problems in science subjects are generally grouped under two headings: algorithmic and conceptual. Another classification refers to well-structured (routine) and unstructured (non-routine) science problems. When the contents of these classification types are examined, it is seen that algorithmic problem types and structured (routine) problems have the same characteristics as conceptual problem types and unstructured (non-routine) types of problems. Items that require the application of formulas and performing mathematical operations are types of algorithmic (well-structured-routine) problems. These are mostly problems that we are used to seeing in textbooks, that have only one correct answer and that require mathematical solutions. In solving these problems, students do not need to think very much and or to bring any interpretation to the problem. They can find the solution to the problem with the formulas they have memorised. For example, in a physics or chemistry lesson, they may be asked about the structure of the atom in a problem: when provided with the number of electrons and neutrons of an ion, students can find its atomic mass by calculating it. There is only one correct answer to this problem and the student is assessed according to this answer. Conceptual (unstructured-non-routine) problem types are questions that aim to reveal how students define and interpret concepts. In order for students to be able to answer such problems, they must have developed an in-depth understanding of the concepts. Unstructured problems are usually situations where a clear definition of the problem is not given, the solution depends on processes, and there are certain criteria to evaluate the solution (Lohman & Finkelstein, 2000). These are such problems that may be encountered in daily life, that do not have a single correct answer, that may even require the use of knowledge acquired from different branches of science, and that contain answers that may be different according to the morality of the person, the environment in which they were raised, or the values they believe in (Dede & Yaman, 2006). The purpose of posing such problems to students is to develop their ability to choose an appropriate strategy, implement this strategy and interpret the results when faced with such a problem, by understanding the logic and nature of the solution of the problem (Altun, 2000). In addition, students who are faced with these types of problems will review their conceptual understanding and improve their knowledge which they can use in solving algorithmic problems. In addition, students who solve algorithmic problems correctly by making use

of the equals they have memorised will be considered successful even if they do not have sufficient conceptual knowledge about the subject.

When studies related to problem types are examined, it was observed that students who were exposed to the same content in chemistry, and who were subject to algorithmic and conceptual problems, achieved high success in algorithmic problem solving, while low success in conceptual questions (Nakhleh and Mitchell, 1993). This finding shows that students could answer algorithmic questions with the formulas they have memorised, but they could not comprehend the concepts. However, students who have acquired conceptual understanding can use this knowledge in solving algorithmic problems. As students have difficulties in conceptual problems, and that they are successful in solving algorithmic problems easily leads to teachers to prefer this type of problem in exams (Nakiboğlu and Kalın, 2003). On the other hand, it is not possible to say that students who are only confronted with algorithmic problem types can easily develop high-level thinking skills such as creativity, critical thinking and problem solving.

Following the information given above about the definitions and types of problems, the question of what kind of process should be used to solve these problems, which skills will be needed according to their types and which skills will be developed comes to mind. Within the scope of this study, the following information was ascertained in the research on problem solving in science and mathematics education.

2. PROBLEM SOLVING MODELS

If the individual comes across a situation in which he does not know what to do is considered a problem, the way in which they attempt to solve the problem can be defined as problem solving. In other words, problem solving is a way of dealing with a task whose solution is not already known (National Council of Teachers of Mathematics [NCTM], 2000) or a means of reaching a solution with acquired prior knowledge.

What is problem solving in educational settings? How should it be? What should students gain through problem solving actions?

Considering that problem solving is a necessary life skill for every individual, it can be said that it is a necessity to provide students with problem solving skills at all levels of education. In this context, when today's science and mathematics courses are examined, it is seen that the common goal in all of these programs is to educate individuals who can produce knowledge, have developed high-level thinking skills such as problem solving and critical

thinking, and can use these skills practically in daily life (MEB, 2018a, b, c, d). With this aim in the curriculum, it is emphasised that educational environments should be arranged in a way that allows students to develop both problem solving and higher-order thinking skills. Problem solving requires the coordination of various knowledge, abilities, attitudes, beliefs and heuristics. Considering this characteristic, it is not a result, but a process that starts with the understanding of the problem (Latterell, 2003) and it is of great significance. Students' application of problem solving steps in other subject areas will also help them to solve other problems they encounter in their daily life (Kargın, 2017). While solving a problem, individuals will go through a scientific process such as understanding the problem, collecting data for the solution, choosing the plan they think is the most appropriate path to the solution, finding the answer to the problem and checking the accuracy of the answer, and thinking about alternative ideas for solving the problem (Karataş and Güven, 2004).

Various problem solving models have been found in the literature review while conducting the research on models. The problem solving models in mathematics (Güner and Erbay, 2021; Gürel, 2018; Kıray and İlik, 2011) and science (Gürel, 2018) found and to be considered within the framework of this study is summarised in the table below.

Table 1: Problem Solving Models in the Areas of Mathematics and Science

| <i>IN MATHEMATICS</i> | | <i>IN CHEMISTRY</i> | <i>IN PHYSICS</i> | | <i>IN SCIENCE</i> | |
|----------------------------------|---|---|--------------------------|-------------------------------------|--|--|
| <i>Polya (1957-1985)</i> | <i>Dewey (1957)</i> | <i>Bingham (1998)</i> | <i>Sutherland (2002)</i> | <i>Serway & Beichner (2000)</i> | <i>Akdeniz (2005)</i> | <i>Küçüközer (2017)</i> |
| <i>Understanding the problem</i> | <i>Recognising the problem</i> | <i>Recognising the problem</i> | <i>Read</i> | <i>Gather</i> | <i>Recognising the problem</i> | <i>Problem comprehension/analysis</i> |
| <i>Making a plan</i> | <i>Understanding and recognising the problem</i> | <i>Explaining the problem</i> | <i>Underline</i> | <i>Organise</i> | <i>Developing temporary hypotheses</i> | <i>Physical/conceptual description</i> |
| <i>Carrying out the plan</i> | <i>Identifying the options that are needed in solving the problem</i> | <i>Gathering information and data about the problem</i> | <i>Reorganise</i> | <i>Analyse</i> | <i>Developing solutions</i> | <i>Developing a plan for a solution/strategy development</i> |
| <i>Checking the solution</i> | <i>Gathering data</i> | <i>Selecting and organising the data</i> | <i>Recall</i> | <i>Learn</i> | <i>Gathering data</i> | <i>Implementing a plan/strategy</i> |
| | <i>Data assessment</i> | <i>Identifying means for solutions</i> | <i>Relate</i> | | <i>Deduction</i> | <i>Assessment of performance of solution to the problem</i> |
| | <i>Reaching generalisations</i> | <i>Assessment of the path to the solution</i> | | | <i>Testing solutions</i> | |
| | <i>Putting the solution to practice and assessing its effectiveness</i> | <i>Putting the solution into practice</i> | | | | |
| | | <i>Assessing the method for solution</i> | | | | |

Considering the problem solving steps given in Table 1, although different steps have been suggested by different researchers or even if the field change, it can be seen that there are steps common to all of them. The common steps in the problem-solving process can be listed as follows:

- Recognising the problem,
- Collecting data/information about the problem,

- Collecting data needed to solve the problem,
- Finding the solution,
- Making deductions,
- Assessing the solution.

When these steps in the problem solving process are compared with the steps followed in the scientific process, it is seen that they have great similarities (Helgeson, 1992:1). This similarity is inevitable when we consider that the scientific method covers the process starting with the recognition of a problem and following through for a solution of the problem. Since problem solving and scientific method involve the same steps, it can be stated that the problem solving method and the teaching approach points to scientific research methods (Dede and Yaman, 2006). The steps followed in scientific research methodology is as follows (Ünal and Moğol, 2020):

- Recognising the problem,
- Gathering information about the problem,
- Presenting a valid proposition (establishing the hypothesis) by establishing the possible relationships considered for the solution of the problem,
- Collecting data with observations and experiments necessary to solve the problem,
- Finding a solution based on the data,
- Investigating proof of the hypothesis with the solution found,
- Repeating and applying observations and experiments in cases where the hypothesis is not proven,
- Recording the findings,
- Presenting the results with interpretations,
- Generating new research questions based on the results.

These steps, which are valid for scientific research, are also valid for the scientific method which is applied in our education system. The scientific method is used synonymously with the problem solving process (Kalaycı, 2001; Ünal & Mongolian, 2020) and it is acknowledged that the human brain only stores information without comprehending if the scientific method is not used. For this reason, it is believed that applying the scientific method or problem solving method can contribute to the development of students' mental skills and, thus, allow them to easily solve problems in their daily life

(Ünal and Mongol, 2020). In today's science curriculum, it is emphasised that the information should not be given directly to students for rote learning, but that they should acquire the information themselves by using the scientific research method (MEB, 2018b, c, d, e). It is believed that only by these means, students can acquire more meaningful and permanent information by acquiring the information themselves. It is stated that the problem solving skills of students should be improved by including, not only exercise-type questions in which operations based on memorised formulas are applied, but also non-routine problem types in mathematics curriculum (MEB, 2018f). These steps, which are valid for scientific research, are also valid for the scientific method adopted in our education system. It is believed that with the scientific method, which is used synonymously with the problem solving process (Kalaycı, 2001), information is not only memorised, but instead meaningful and permanent learning is possible.

3. 5E AND 7E MODELS

The 5E model is one of the leading models that creates a framework (facilitates) the use of scientific method or problem solving steps in physics, chemistry or science lessons and enables teachers to plan lessons according to this method. The steps in this model matches the scientific research steps and offer the student the opportunity to construct knowledge. The model steps are as briefly described below:

1st E-Engage: In this step, the student's prior knowledge about the subject is revealed and it is aimed to draw their attention to the subject they will learn. For this purpose, materials such as pictures, slides, stories, etc. can be used. In doing so, it is aimed to ensure that students form questions in their minds and are ready to question and learn.

2nd E-Explore: This is the step where students need to be most active mentally and physically. Students who become ready to learn about the topic in the previous step are now expected to develop hypotheses and make predictions. Teachers should guide students in planning experiments in line with their hypotheses, without giving direct instructions. At this point, students should be given opportunities to work with each other to discover new ideas, make observations, collect data, test their hypotheses by testing their predictions. With these activities, students are expected to start finding answers to the questions posed during the interest-generating stage. Meanwhile, teachers are expected to guide students in reaching the answers with guiding questions, the resources they provide and the feedback they give.

At this step, in which high-level cognitive skills at the level of application, analysis and synthesis are used, possibilities are considered, hypotheses are tested, experiments are carried out and findings are obtained. In short, at this step students are given opportunities to develop concepts and skills.

3rd E-*Explain*: This is the step where students are expected to provide explanations about concepts by revealing their conceptual understanding and process skills. The teacher should help students replace their ineffective ideas with more accurate ones, and should give explanations only to add depth and contribute to students' explanations. Students give their explanations by means of writing, art, drama, graphics, etc. and come to generalisations by using them.

4th E-*Elaborate*: At this step, students apply the knowledge or problem-solving approaches which they gained in the previous steps to new events, problems and daily life situations. Students encounter new information and problems that did not exist previously. Students, who try to solve the problem by deepening their knowledge in the light of their current knowledge and experience, learn to struggle, to act again, to cope with new situations, to critique situations.

5th E-*Evaluate*: This is the step where the performance, skills, concepts and practices of the student are evaluated. Tests, portfolios, interviews, etc., as assessment tools. can use. It is also an opportunity to evaluate students' level of understanding, as students are encouraged to question their own concepts (Akben, 2011).

Later on, the 5E model was further developed and the 7E model, which includes 7 steps, was created. As Kanlı (2007) cites from Bybee, the first four stages of this model are the same as the stages of *arousing curiosity, discovery, explanation and extension* in the 5E model from 2003. In the 7E model, these four steps are followed by the stages of *association* (inclusion), *exchanging* (exchange of ideas) and *evaluation*. Since the first four steps are the same as the 5E model, the 5th, 6th and 7th steps are explained below.

5th E *Extend*: At this step, the teacher should guide the students so that they can associate the concepts they have learned with examples from daily life to more advanced events and concepts in other fields. Students try to establish a relationship between what they learn and real-world concepts.

6th E *Exchange*: It is the stage where students exchange ideas in interaction with their classmates and others. In this way, students seek cooperative solutions to the problems presented to them.

7th E *Evaluate*: In this model, the evaluation step is not complete at once, as in the 5E model. Evaluation is based on a process, whereby evaluation methods are used. In addition, at the end of the lesson, the students are asked open-ended questions such as “What do you think about this?” or “Why did you think so?” (Kanlı, 2007).

It is stated that, upon considering the grade levels of the students, while the 5E model is recommended for primary and lower secondary school students, the 7E model can be applied (in addition to the 5E model) for upper secondary students.

Considering the importance of using the scientific method in science lessons and providing students with problem-solving skills, the positive impact of using the 5E and 7E models for this purpose has been proven by many studies, it can be stated that using these models in lessons should be a requirement, not a choice. Despite this need, it is known that teachers have reservations about using these models and that they have concerns about making mistakes, especially in development of the steps. For this aim, this study has developed lesson plans for chemistry based on the 7E model and the 5E model for a physics lesson was developed by selecting the attainments for upper secondary level.

The topic of “Chemical Equilibrium” was taken as a basis for the chemistry lesson and a 7E model lesson plan was developed for 11th grade students:

- To explaining the chemical equilibrium over the forward and reverse reaction rates,
- To be able to make calculations by deriving equilibrium expressions in terms of concentration and pressure for reversible reactions,
- To investigate the relationship between different equilibrium constants.

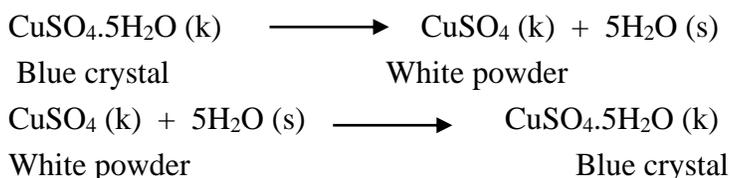
3.1. 7E Model Lesson Plan for Chemical Lesson

1st E-Engage: The first attainment of this lesson is that students can associate equilibrium to forward and reverse reaction rates. Thus, before going into the concept of equilibrium, the aim is to understand that there are two-way reactions, as well as unidirectional reactions. For this purpose, at this step, the attempt is to draw the attention of students to the reversible reactions, without undertaking the concept of equilibrium. The two different situations suggested below are given. Depending on the grade level, conditions and

choice, one of the following two situations can be preferred or both can be applied.

Preference 1 Experiment

$\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ (Copper (II) Sulphate pentahydrate) is a blue coloured crystal, as shown in the following reactions. When this crystal is heated, it loses its water and turns into Anhydrite (anhydrous) CuSO_4 (Copper (II) Sulphate). Solid CuSO_4 is a white powder. When a few drops of water are added to CuSO_4 in its white powder form, a blue coloured $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ crystal can be obtained again.



This experiment can be conducted in the classroom/by the students and/or a video can be recorded and shown.

Preference 2 Experiment

Heat pads are brought to the classroom so that students can use them. If this is not possible, videos such as “How to use the helios heater pads” can be watched. After the experiment in the classroom or watching the video, the students can be asked various questions, such as:

- At the beginning, was the bag warm or cold?
- Why did the substance inside the bag change when the metal on the bag was pressed?
- What do you think is the reason for the temperature change?
- What happens when you reheat the bag?

Preference 3 Experiment

Students are shown a picture of a car battery and asked questions such as:

- What is the use of batteries in vehicles?
- What does it mean to charge a battery?

By doing so, students can understand that batteries provide electrical energy to vehicles and produce this energy as a result of chemical reactions. Afterwards, it can be explained that by reversing this process by charging the

batteries, the initial chemical substances are regenerated with electrical energy provided.

2nd E-Explore: At this step, an experiment is conducted with students using Sodium Acetate (CH_3COONa). For the experiment, the students are divided into groups. Each group works with solutions at different temperatures, all groups can work with solutions at all temperatures, or individual students can have solutions prepared at different temperatures. All the findings obtained at the end of the experiment are shared with the class.

Experiment:

Hypothesis: An amount of CH_3COONa sinks to the bottom. The substance gives off heat as it sinks to the bottom.

Dependent Variable: Dissolution amount

Independent Variable: Temperature

Controlled Variable: Solvent and solute amount

Tools-Materials of Experiment: To be given to each group: 2 x 100 mL beakers, CH_3COONa , hot water, glass funnel, filter paper, baguette, spatula, ice.

Experiment Method: After giving materials to each group:

Group 1: 25mL of water up to 60°C (As the solubility is 139g/100g water, 139/4g is taken)

Group 2: 25mL water up to 70°C (153/4g.)

Group 3: Heats 25mL of water to 80°C (161/4g.) and determine how many grams of CH_3COONa are completely dissolved. They are instructed to continue the process until the insoluble solid remains.

(All solutions at 60°C , 70°C , 80°C can also be prepared for each group.)

Then, these solutions are filtered and the temperature is reduced to 5°C . A small amount of CH_3COONa is thrown into this solution and they are asked to record their observations. The results recorded by the students are shared with the class.

Result of the Experiment: The following questions are asked to the students.

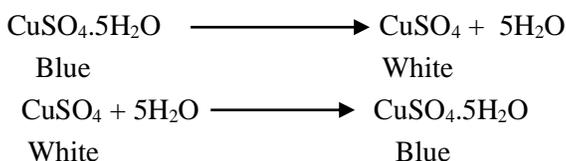
-How does the solubility change with temperature?

-Were the expected changes observed after lowering the temperature of the solution? Why?

- Explain what you observe when a small amount of CH_3COONa is thrown into the low temperature solution?
- What would you expect to happen if you reheated this substance? Why?

Observe by heating the substance.

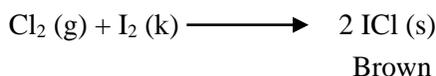
3rd E - Explain: Students are divided into groups of four. Each group is given a spatula of $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ inside a porcelain capsule, which students are asked to heat and observe the colour change when heated (students are not told what the substance is). They are asked to continue the heating process until the substance in the capsule turns completely white, and when this happens, the groups are instructed to end the heating process.



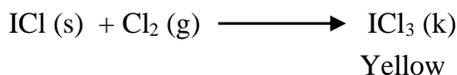
After the heating process is completed, the students are asked to drop a few drops of water onto the white powder with a dropper. The students who observe a colour change are asked to discuss among themselves and try to guess the reason for the change from blue to white or the change of white to blue. Then, each group is asked to choose a spokesperson and explain their predictions to the class. If the student guesses are not sufficient, the students are asked to consider the effect of water and the reaction with heating and then with water. (Since students do not know that it is a hydrate compound, they may think of it as a reaction with H_2O . Depending on the grade level, the concept of hydrate is explained, or it can only be mentioned as the removal and addition of water regarding the colour change.)

If the conditions do not allow to do the experiment given above, the following reactions can be given and the existence of reversible reactions can be shown, allowing students to discover the situation by discovering it.

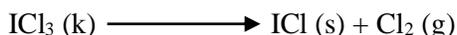
If Cl_2 gas is passed over I_2 in its solid state, brown ICl liquid is obtained.



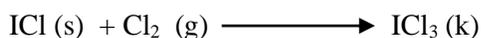
If Cl_2 gas continues to be given after ICl formation, yellow coloured ICl_3 starts to form.



If the chlorine gas is stopped, now, it should be observed that the yellow crystals turn into brown liquid.



As a result, a reversible reaction takes place between iodine monochloride and iodine trichloride.



After these explanations about equilibrium, it is explained that the equilibrium is dynamic in the extension phase.

4th E - Elaborate:



Figure1: Color Changing Mug (URL-1)

At this step, students can be asked how hot or cold substances placed in the mug can cause a colour change by first showing the above visual to the students. Before and/or after this image is shown, videos about such items made with thermochromic paint are viewed. If this is not possible, it can be asked how toothbrushes that change colour as they brush their teeth also show this feature. After the students' opinions and class discussions on this subject, the topic of dynamic equilibrium is introduced and the students are made aware of dynamic equilibrium by presenting the following visuals. With is aim, students are first shown the equilibrium which shows the reverse reaction:



Then, students are asked what is being explained by the arrows showing the ions in the image below and their movements.

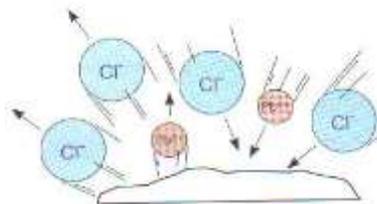
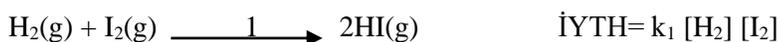
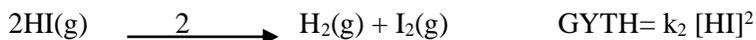


Figure 2: Happening of the same rate in both direction (Gallego & Ingram, 2000).

In addition to the above reactions, the following reactions are provided to explain the dynamic equilibrium.



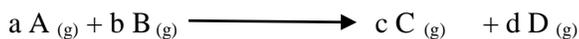
Then, reminding that products turn into reactants in equilibrium reactions, they are asked to write down the reaction of the products to reactant and its rate equation.



In case of equilibrium, $K_{\text{equilibrium}}$ is explained and its formula is given using the equation Forward Reaction Rate (FRR) = Reverse Reaction Rate (RRT).

$$k_1 [\text{H}_2] [\text{I}_2] = k_2 [\text{HI}]^2 \quad K_{\text{equilibrium}} = k_1 / k_2 = [\text{HI}]^2 / [\text{H}_2] [\text{I}_2]$$

Since k_1 and k_2 values will be constant at equilibrium temperatures, their rates will also be constant and this is called the equilibrium constant. Since rate constants (k_1 , k_2) depend on temperature, the equilibrium constant also depends on temperature. If the equilibrium constant is greater than 1 ($K \gg 1$), the equilibrium will have a tendency towards the products. If it is less than 1 ($K \ll 1$), the equilibrium is directed towards the inputs. As a result, the concentration of the inputs increase.



For the reaction, the following explanation is given:

$$K_{\text{equilibrium}} = K_C = \frac{[C]^c [D]^d}{[A]^a [B]^b}$$

$$K_P = \frac{(P_C)^c (P_D)^d}{(P_A)^a (P_B)^b}$$

$$(P \cdot V = n \cdot R \cdot T)$$

$$P \cdot V = M \cdot V \cdot R \cdot T$$

$$M = P / R \cdot T$$

If K_P is removed from the $K_C = K_P (1/ R \cdot T)$ equilibrium, $K_P = K_C (R \cdot T)^{\Delta n}$ is obtained.

Δn = total molarity of the product – total molarity of the input

5th E - *Extend*: At this step, the following text can be read to the students, as it is expected that the students will be able to associate the concepts they have learned with examples in daily life, more complex events and concepts in other field areas.

The temperature of the water in Pamukkale, which is located in Denizli – Turkey, has 17 thermal springs and the water temperature varies between 35-100 degrees. These spring waters, which have been flowing since antiquity, flow over the travertines from a 320m long channel from the spring. From here, 60-70m of it flows into the travertine surfaces where precipitation occurs. The water makes its way over an average of 240-300m. Calcium carbonate, which precipitates from calcium bicarbonate water flowing over the layered pools and banks, is initially in the form of a soft gel. It hardens over time and becomes the “travertine”. However, when visitors walk on the surface, it leads to the deterioration of the travertines.

Some visuals and/or videos can be shown to accompany this text.

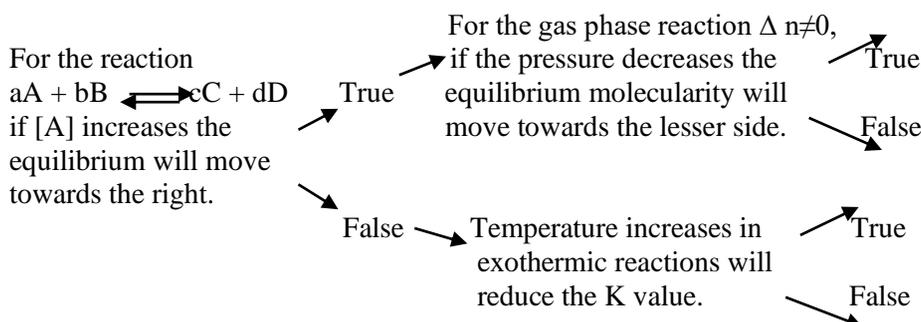
6th E - *Exchange*: At this stage, as the students are expected to find a solution to the problem in interaction with their classmates and other groups, the following reading passage containing the information about the text above can be provided to the students.

Under pressure, groundwater containing dissolved carbon dioxide carries the calcium carbonate (CaCO₃) to the regions they pass through, by dissolving it. (The solubility of CaCO₃ is 1.7mg/100mL.) In addition, traces of Ca(HCO₃)₂ are formed on damp CaCO₃ surfaces with the effect of CO₂ in the air; therefore, all water in contact with limestone contain Ca(HCO₃)₂ in dissolved form. (The solubility of Ca(HCO₃)₂ is 1.2g /100mL). Most of the dissolved calcium bicarbonate turns into water-insoluble CaCO₃ due to

evaporation of water. (Limestone forms in places where this condition occurs where it passes.) Similar to spring water that come to the surface, when the water suddenly comes out into the open to an environment which not under pressure and the carbon dioxide evaporates, the calcium carbonate dissolved in the water precipitates on the rocks in very thin layers (Wikipedia). This soft accumulation, which is formed as a result of the precipitation of lime, hardens over time and forms travertines in the form of steps.

Weather conditions, heat loss, spread and duration of the flow are effective in the formation of the white colour. The precipitation continues until the carbon dioxide in the thermal water comes into equilibrium with the carbon dioxide in the air. In the on-site analysis shows that, while the carbon dioxide amount of the water at the spring is 725mg/L on average, this amount drops to 145mg/L when the water leaves the travertines. Similarly, calcium bicarbonate decreases from 1200mg/L to 400m/L. Likewise, Ca decreases by 576/8mg/L. According to the results of this analysis, 499.9mg of CaCO_3 precipitates on the travertine from 1L of water. This means an amount of 43191g per day for 1L/s of water precipitation. Since the average flow rate of water is 466.2L/sec, an area of 13584m² area can be whitened. In practice, these conditions are difficult to meet. However, according to this theoretical approach, 4.9km² of a thickness of 1mm area can be whitened annually.

7th E - Evaluate: The evaluation phase of the 7E model is not conducted at once, as in the 5E model. Students can be asked open-ended questions about various chemical equilibrium issues. In addition, if there is a need to make a short evaluation at the end of the lesson, the following question prepared with the *diagnostic branched tree technique* can be asked to the students.



3.2. 5E Model Lesson Plan for Physics Lesson

The lesson plan prepared for the 5E model for a physics lesson, the following two attainments for the topic of “Constant Acceleration in One Dimension” are based on the 11th Grade “Motion and Force” unit of the curriculum.

- Analyses motion with constant acceleration in one dimension.

a) *Equations for motion are given.*

b) *Students are instructed to draw and interpret the position-time, speed-time and acceleration-time graphs related to motion with constant acceleration and to convert between graphs.*

- Calculates motion with constant acceleration in one dimension.

1st E - Engage: At the step, two different situations can be suggested, as given below. Depending on the grade level, conditions and choice, one of these two situations can be preferred or both can be applied.

Exercise for Situation 1



Figure3: Green wave (URL-2)

-What does green wave mean, as seen in the picture?

Exercise for Situation 2

You visit various companies to get information about cars.

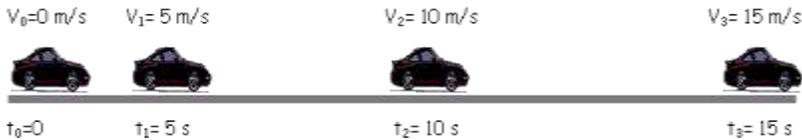
One company representative gives you the following information about two cars which have the same engine:

Car No 1: This car goes from 0 to 100 kilometres per hour between 10.4 to 10.7 seconds.

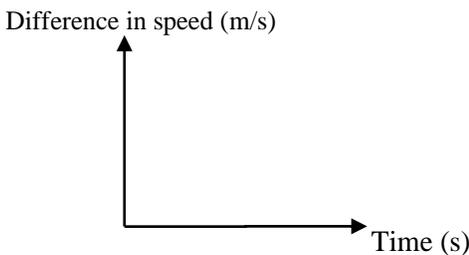
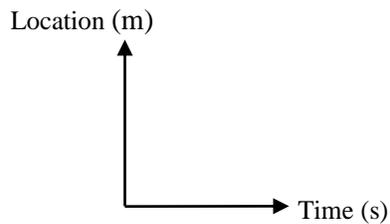
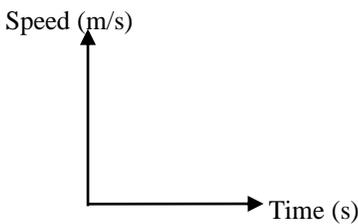
Car No 2: This car goes from 0 to 100 km per hour in 12.2 to 12.5 seconds

What does this information mean to you?

2nd E - Explore: At this point, students are given the below visual and instructed to draw graphs.



The picture above shows the speed reached by a vehicle at the end of 15 seconds after starting to move. Draw the graphs below, taking this data into account.



After drawing the graphs, the students are asked what they can say about the movement of the car, taking into account the picture provided. Then they are asked to design an experiment in which the speed of an object will change (increase - decrease) equally, at equal time intervals. For this purpose, an experiment worksheet is given below.

Experiment Design

Independent variable:

Dependent variable:

Control variable:

Hypothesis/hypotheses:

Tools-Materials:

Method:

Result: (Show your results on a graph)

3rd E - Explain: At this step, in order to explain the concept of acceleration, various questions should be asked to the students first and the students should be encouraged to recognise the problem. If there are mistakes in the explanations of the students, the teacher should intervene to correct them or complete what is missing. At the end of this step, the teacher may provide students the information as summarised below.

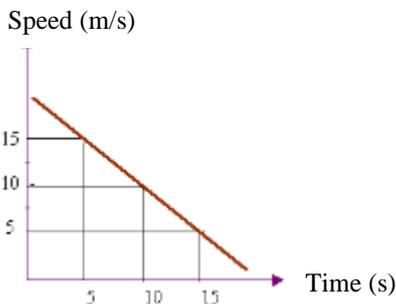
If an object in motion has different locations in equal time intervals, the motion of this object is called accelerated motion. The amount of change in speed per unit time is defined as acceleration. It is calculated with the Acceleration = Speed/Time equation and is expressed with the symbols $a = v/t$. Its unit is m/s^2 .

If the speed of a motion increases or decreases in a stable manner, that is, if the change in speed per unit time is constant, this motion is called a motion with constant acceleration.

4th E - Elaborate:

Situation 1, where the students are expected to provide an answer.

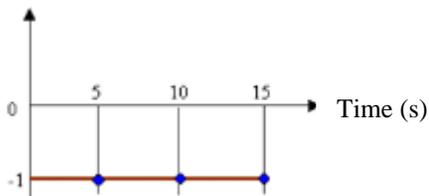
- The below question is asked according to the speed-time graph given for an object in motion.



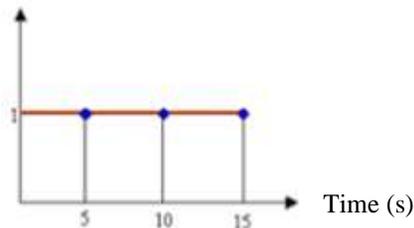
- According to this, which of the below is the speed-time graphic?

Why?

Acceleration (m/s^2)



Acceleration (m/s^2)



Situation 2, where the students are expected to provide an answer.

A vehicle waiting at a red light starts to move when the green light comes on, and it takes 8 seconds to accelerates with a constant acceleration of 5 m/s^2 for a period of time. After this, it slows to a stop with an acceleration of -2.5 m/s^2 . Accordingly, show the speed, acceleration, distance and time values of the vehicle on a picture. (Don't forget to show the signs)



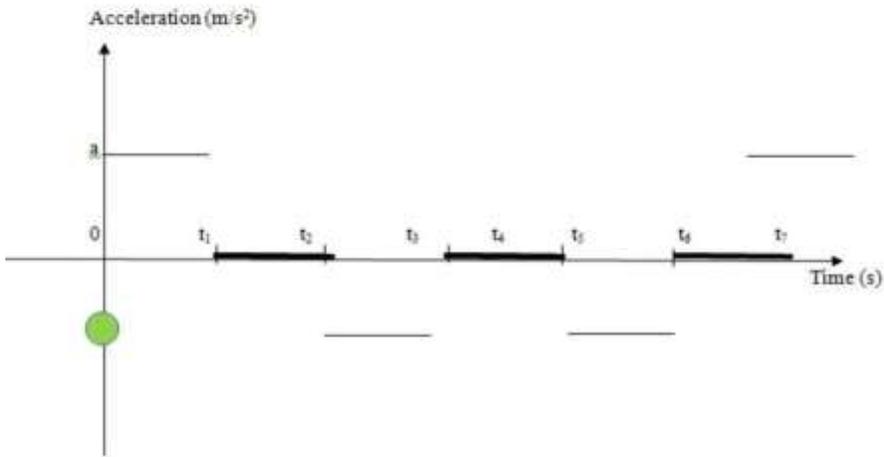
5th E - Evaluate:

Question 1. The vehicle, whose initial speed is zero, accelerates at 4 m/s per second as shown. (Increases its speed by 4 m/s per second). This motion takes 5 seconds.

- Draw the speed-time and position-time graphs of the object accordingly.



Question 2. Place an object at the point shown in green in the graph given below. Define the motion of the object for each time interval, taking into account the acceleration-time values of the object. Draw speed-time and position-time graphs.



CONCLUSION

One of the main aims of science lessons, which is emphasised in the curriculum of science subjects, is to ensure students acquire problem-solving skills. Due to its nature, the same aim is also present in the curriculum of mathematics lessons. When the problem types for these two disciplines are examined, it is seen that not only numerical problems but also verbal problems are the case, and the problem solving steps in both disciplines are very similar to each other. Therefore, this research study was carried out with the belief that students' problem solving skills can be improved with practices undertaken in science lessons and that these can also contribute to the solution of problems in the field of mathematics.

As a conclusion of the research study, it was seen that the scientific method, which is frequently recommended to be used in learning environments in science lessons, can improve students' research-inquiry skills, and makes a significant contribution to improving their thinking and problem-solving skills for problem situations they may encounter in their daily life. For this purpose, the research attempted to ascertain how this method can be applied to physics and chemistry lessons (which are science subjects), and it has been found that the 5E and 7E models are among the most suitable models for upper secondary education level students. On the other hand, it was seen that these models are not often applied in lessons. In this context, among the most important reasons put forward by the teachers

for this reason is that they think that they may make mistakes while creating the steps of the method and that they may experience problems, such as discipline and lack of time during the lessons in the classroom environment. However, it is clear that these perceived problems will not be experienced in a lesson prepared rigorously by taking into account the steps of this model. Based on this idea, this study attempted to provide lesson plans based on the 5E and 7E models taking into account the attainments taken from upper secondary physics and chemistry curricula were developed and examples were presented for the use by teachers. Before the lesson plans were prepared, all the steps of the models were provided in detail and an attempt was made to explain how they were constructed in terms of learning outcomes. It is hoped that these and similar examples will encourage teachers to apply the methods and may guide their further work. In addition, it is believed that the methods are important in terms of objectifying practice and not remain in theory.

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CHAPTER 2

USING INTERACTIVE ACTIVITIES FOR TEACHING ENGLISH IN CHILDREN

Ecaterina KORSHKOV¹

Dr. Halil KÜÇÜKLER²

¹Comrat State University, Faculty of National Culture, Department of Foreign Languages, Moldova - Comrat, minakatea23@gmail.com, ORCID ID: orcid.org/0000-0002-7829-1595.

²Dr., Balıkesir University, Foreign Languages Department, hkucukler@gmail, ORCID ID: orcid.org/0000-0002-7674-540X.

INTRODUCTION

Teaching profession is the oldest profession in the world. Since primitive times, a man was forced to study and teach in order to continue. In the history of pedagogy, a variety of forms of educational organization are known. Each new historical stage in the development of society leaves its own imprint on the organization of training. As a result, pedagogical science has accumulated significant material in this area. Modern education is aimed at personal-oriented education (the task of the teacher is not so much the transfer of knowledge as the formation of the personality of students and their readiness for self-development), as well as an emphasis on remote indicators of the teacher's performance (this is not only the use of knowledge and skills learned in this educational institution, but also the ability of students to self-development, self-organization). The effectiveness of pedagogical work determines the level of professionalism of the teacher (Vygotsky,1996). In general, the professionalism of the teacher is determined by the fact that he knows how to teach and educate, how to transfer students from one state of training, education, upbringing to another, and do it in quick and economical ways. Modern education, quality is associated with the introduction of new training technologies into the educational process, which would provide qualitative changes in the training of future specialists.

Among the innovative technologies of training is the technology of active training, when using which the professional qualities of doctors and pharmacists are formed through immersion in a specific situation, modeled for educational purposes. The main essential feature of using active learning methods is the game nature, which is mainly carried out due to the presence of various roles. In the process of role interaction, educational and simulated practical tasks are solved, values, knowledge, and skills are exchanged during the implementation of specific pedagogical tasks. Each new historical stage in the development of society leaves its own imprint on the organization of training. As a result, pedagogical science has accumulated significant material in this area. Modern education is aimed at personal-oriented education (the task of the teacher is not so much the transfer of knowledge as the formation of the personality of students and their readiness for self-development), as well as an emphasis on remote indicators of the teacher's performance (this is not only the use of knowledge and skills learned in this educational institution, but also the ability of students to self-development, self-

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1. Theoretical Aspects of Teaching Methods

The goal of formal education is to prepare and educate people so they can be adequately integrated into the community they live in (Baruah,1991). An important role in non-formal education is played by a special environment that is created with specific pedagogical goals. The position of updating the creation of special educational environments is based primarily on the scientific views of L. Vygotsky (Vygotsky,1996),who recognized the social environment (or rather, the environment in general, with a dominant social component) as the main educational, personally dominant factor. He determined the organization of such an environment as the most important, priority task of the teacher. An example of the specific implementation of these ideas in modern practice is the organization of summer schools, expeditions, environmental camps and some other informal education events. To begin with, we note that modern teaching methods, unlike traditional ones, are characterized by slightly different features, namely (Brown and Yule, 1983) indicated the following comments:

- Modern training methods are already being adapted in the process of development to a special pedagogical plan. The development is based on a specific methodological and philosophical view of the author of an individual selection;

- The technological sequence of actions, operations and interactions is based on the target installations that represent a clear expected result;
- Implementation of methods involves related activities of teachers and students, which has a contractual framework and which takes into account the principles of differentiation and individualization, and also optimal use of human and technical potential. Communication and dialogue should be mandatory components.

Teaching methods change over time, as they are closely related to the social, cultural, technological context. For example, at the earliest stages of the development of mankind, the method of imitation prevailed - young members of the primitive community watched the elders and thus learned to create tools, get food, and so on. The emergence of the language made it possible to teach descendants orally. Writing and then printing fixed reading books for a long time as one of the main methods of learning. And of course, the invention of computers and the Internet also played a role in the way people teach and learn (Ibid). Babansky formulated the principle of optimality in the choice of teaching methods, based on the fact that each of them is focused on solving certain pedagogical and educational problems (Vakulenko, 2001). Therefore, it is very important for a teacher, trainer or methodologist to understand the advantages and disadvantages of different methods in order to apply them most effectively.

There are also other classifications:

- Verbal

We are talking about the transfer of information from mouth to mouth. In modern education, this is the most widely used method. It is primarily expressed in lectures. A type of verbal training is personal consultation on the issue of interest.

- Visual

Visual methodology involves the use of additional tools that directly or indirectly reflect the subject of study. Conditionally visual options can be divided into: the use of diagrams, tables and models, for example, school posters on the anatomy of a person or skeleton;

- the use of technical devices, an example is the study of physical

- phenomena using an ammeter;
- video and audio materials, an example is watching a documentary about World War II.

According to research, the perception of information using visual techniques is increased by tens of percent. That is why modern schools are equipped with multimedia equipment and technical tools.

- Practical

Practices are based on engaging the audience in the process. Considering that this technique reflects the greatest effectiveness, it begins to be used more actively. Examples of involvement include: trainings and practical tasks, an example is herbarium collection; games aimed at solving specific problems, an example is a business game in order to find a compromise solution. It is difficult to build the process exclusively on practical methods, but it is necessary to include them in the general course. Especially when it comes to difficult or important topics. It will be easier for students to delve into the essence and remember.

Ways to transfer knowledge:

a) a business game is an imitation of a specific situation that a person may encounter. Situational scenarios from future professional activities are most often used. The players are tasked with solving a specific issue. The game always has a theory, that is, a description of the characters and events preceding a particular passage. The heroes need not only to complete the task, but also to play the role of a fictional character or even a real person, to put themselves in his place

b) the educational game, unlike the business game, is aimed at solving specific goals for participants in gaining knowledge. The basic principles of the educational game include: modeling - superimposing real situations on the game; having a problem - students should not only survive the incident, but also look for optimal solutions; joint activities - all participants are involved who, through dialogue, must learn communication and group interaction. It is permissible to conduct a training game both before mastering the material in order to find out the level of knowledge of students, and after. In the second version, there will be a fixation of the received information and a clear example of its application in practice. What is the difference between formal and informal education?

- Formal education is recognized by the state as well as the industry,

and people tend to gain employment opportunities based on the level of formal education achieved.

- Non-formal education is not recognized by the state, but plays an important role in general human development. This training system is mostly casual and verbal and is not structured like formal education.
- Teachers in the formal education system are formally trained and given responsibility for teaching depending on their competence.
- Formal education takes place in classrooms and informal education in life.
- Formal education has a specially designed curriculum, while non-formal education lacks a curriculum and structure.

The distinctive features of non-formal education also stand out:

1. the functional nature of the content, its susceptibility to the local environment and the ability to respond sensitively to its needs;
2. specificity of goals: often set in the near future, limited geographically, contextually or by the group;
3. the program is designed to meet specific, predefined needs with a student-centric approach;
4. flexibility in implementation;
5. heterogeneity of target groups;
6. activities that can be organized and systematized, alien to routine;
7. activities, occasionally organized and short-term;
8. the use of volunteer or non-staff teachers, the involvement of non-professionals on a paid or voluntary basis;
9. self-sufficiency and broad participation.

2. The Using of Non-formal Methods in the Teaching of English

Learning English at the desk, by memorizing the rules, doing grammar exercises and retelling numerous texts, often does not arise in adulthood. It is understandable: ten years of school cramming have proven to many the inefficiency of traditional methods of learning foreign languages.

For those who have become disillusioned with the traditional approach to education, today there is a huge choice of alternative methods. Unconventional methods are based on the identification of non-obvious, hidden possibilities of the human brain. Rules and theories in non-traditional

methods are paid as little attention as possible, while the main emphasis is on unconscious mastery of foreign languages. Alternative techniques can be roughly divided into two large groups: some offer as complete immersion in the language environment as possible, others - memorizing language constructions by repeating them repeatedly. There are also techniques of the twenty-fifth frame (when a hidden picture built into the video sequence affects the subconscious) or techniques for learning languages in a dream (Christine C. M. Goh, 2007). Although these methods are often mistaken for quackery, today, in fact, there are all kinds of (varying degrees of high-tech) methods that allow you to learn languages without putting any effort into this. However, for the most part, all these miracle techniques relate so far to the possibilities of the future. Today, however, it is still more effective and more reliable to learn the language while awake, but everyone can choose the educational methodology at their discretion.

2.1. Games: Advantages And Disadvantages

In this part of the study, it is going to be carried out some of an informal education experiences as studio "Kid's up!". The teaching experiences are some practices using non-formal education methods, working with children from 2 to 14 years old (*Images 1-4*):



Image 1: Game “Cards” for studying English



Image 2: Lesson with children 2-5 years old



Image 3: Lesson with children 2-5 years old



Image 4: Lesson with children 10-14 years old

In this regard, an interview was held among parents (*Appendix 4*). 30 parents joined the interview. Of which 13 are men and 17 are women. Ages 25 to 50. About 70% of parents know about informal education. At the same time, they use such methods in the study of the house. Children from the age of 2 know many words in English and practice them in ordinary life (*Appendix 5*):

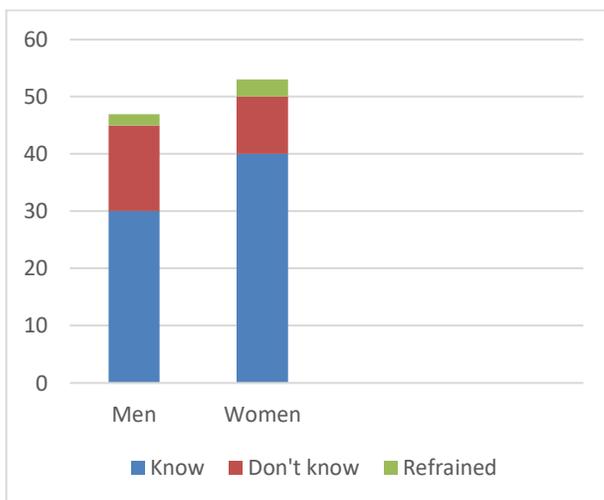


Chart 1 – Interview reflection of parents about non-formal education

Methods are used to learn English in the modern world. In this section, it is going to be looked at methods in the most common method aimed at helping participants get into the working atmosphere and get to know each other better. The Ice breakers are the activities, which can be represented by two exercises: Stuck in the back and discovering while moving. The game "Stuck in the back" has the goal of demonstrating different biases and stereotypes that exist in relation to different cultures, and determine the main reasons for the latter. Use the discovering while moving exercise effectively to meet participants and search for information about each other. Questions can be diverse, culturally oriented, or general, such as: I have got three pets; I speak three languages. To cheer up and create a friendly atmosphere, energize participants before any activity, you can use a method called "Energizers" - "Antidepressants." The level of mood with which participants begin to complete the task depends not only on how the method was presented, but also on each participant or entire group. Below, it is offered antidepressants that it is thought that they best suited for maintaining intercultural communication and learning. «60 seconds – how much is it?» - this exercise aims to discuss the perception of time by representatives of different cultures and even in homogeneous groups. "The onion of diversity" - this exercise is used to show the similarities that can be found in different cultures and demonstrate how much they share in common. Here it can be discussed the following questions: What similarities and differences are of interest to us?

Secret fairway - another hurdle-breaking exercise. 7-8 participants line up with a train and hold on to each other. Everyone except the first is blindfolded. The first participant is the helmsman. The helmsman must lead his ship to the opposite wall bypassing the mine obstacles without a single word. The main difficulty is that the "tail" has the property of wagging and flying on "mines" so that this does not happen, each participant must exactly repeat the movement of the previous one. The exercise can be complicated by increasing the length of the ship and the number of mines.

Living bridge - the group stands in two lines, facing each other. Opposing people hold each other's hands tightly. A person lies down in his hands and moves to the end along the "living bridge." Then the next, etc.

Silent mirror, talking mirror - two people are chosen who will be mirrors - silent and talking. The leader is selected, he becomes the face of the mirrors. Behind him stands any of those present. The task of the silent mirror is to show this person with pantomime, the task of the speaker is to speak associations with this person. The presenter can turn to any of the mirrors to guess who is behind him.

Geometric shape - long ropes are tied into two large rings (rope rings as many as groups are created, the length of the rope depends on the number of participants). Children become in a circle, holding on to a rope ring with both hands. The counselor invites the guys to build a square, triangle, pyramid, star, diamond, closing their eyes and not letting go of the rope. Participants have the right to consult, talk out loud, look for a solution in the exact time allotted.

Camera - The group is divided into pairs. The first in a pair becomes a photographer, the second camera. The camera closes his eyes, the photographer brings him to an interesting place in the room, and slightly pressing on his head "takes pictures" (the camera opens his eyes for a second, and then closes again). Then the camera must guess where the pictures are taken. The roles then change. In fact, the exercise has a hidden subtext, which is mentioned in the subsequent discussion. The most important points are as follows: which of the photographers led his camera, whether he warned about the dangers, whether he was thinking about a partner or only about himself. How comfortable the camera was with its photographer, how much he trusted him. Who was more pleasant to be a photographer (that is, a presenter), who a camera (that is, a slave), etc.

Guru - Participants close their eyes and begin to walk around the room, putting their hands in a protective pose in front of them. The host touches the

shoulder of one of the participants, who becomes Guru (teacher). He opens his eyes, but from that moment on he has no right to talk. Everyone else walks around the room with their eyes closed. When they meet, they ask each other: "Are you a Guru!?" If someone does not receive an answer, it means that he has had unheard of happiness - to meet the Guru on his way. He puts his hands on the teacher's shoulders and goes after him, opening his eyes. From now on, he must also be silent. If 2 "regular" players meet, to the question: "Are you a Guru!?" Both answer: "Guru!" - and both continue to search further. The game ends when all the players have found Guru and lined up behind him in a chain.

Hooray, they love me! - all players stand in a circle, facing each other, "numb," put their heads down, look at the socks of their boots. At the signal of the presenter (count three), everyone looks up and looks at one of the people standing in the circle. If the two met with glances, they loudly shout "Cheers, they love me!!!," extend their hands to each other, hug and leave the circle. The circle narrows. The game continues until all the pairs are formed.

Pencil in a glass (older children!) - the group stands in a tight circle. There is a man in the center. A person should be mentally relaxed. He begins to fall (without bending his legs) in some direction. The group catches him and brings him back. The first option: a person chooses where to fall. The second option: The group pumps a person in any direction. Safety: The initial position of those standing in a circle is the right leg forward, the left back at the stop, the hands are extended forward. A person is caught in the palm of his hand. The group requires a lot of attention and accuracy, otherwise a person can be greatly harmed. If there is a very weak person in the group, then you can either put him between two strong ones, or put a stronger person behind him, who will put his hands under his shoulders and duplicate him (while it is important not to offend this person himself).

When it is read a summary or listen to a lecture, it is passively consumed information: some part of the knowledge is stored in memory, and some flies out of our heads. Another argument in favor of cards: it is easy to repeat material with them. Do not carry textbooks and notes with you, do not turn the pages for hours. The technique helps to organize information and refresh it in memory in small portions at a convenient time. There are three options:

- By hand, when everything is written and pasted on its own.
- With the help of familiar text and graphic editors like MS
- Word or Power Point, then the cards will only have to be printed.
- With services and applications.
- When I work with this method, I have some regulars:
- Make short cards!

One phenomenon is one element. It can be a single word or a dictionary definition. Making a card with a whole list of exception words is ineffective: it's like looking at the same list in the summary. It is better to do separately for each word and combine them into the series "Exceptions." And do not try to fit a chapter from a textbook on one piece of paper - choose the main thoughts.

- Write clearly!

Often, the brain "stumbles" and cannot remember the information, because it is too difficult to submit: with smart words or teething speech turns. They should not be in the card - convey only the essence of the phenomenon. And if in the definition or description you cannot do without a complex word, make a separate card for it.

- Use colors and highlights!

For example, emphasize the reference words in definitions. Or indicate parts of speech in words in different colors, if necessary. Try to make the card visual and interesting.

- Add context to definitions!

It is not enough to remember the material - you still need to be able to correctly apply what has been deposited in memory. To learn not only to crank information, but to use it, add context to the defining side of the card. For example, a sentence in which a word in a foreign language appears, or a topic in which a definition is needed. Just don't overdo it. Remember that the card should be simple in the first place. If the context complicates everything, throw it away.

- Use images!

It's just that words are remembered worse than those next to which the

image stands. Add pictures to each card using the association method. This is more convenient to do in special programs. But if you stick a picture or draw a diagram with your own hands, then it is much better to remember the material (*Image 6*):



Image 6: Cards with images

2.2. The Impact of Movie Screenings on Learning English

What is the main problem in the study of English? It is seemed to know words, even grammar is not at zero, but it is impossible to speak and understand others. Because there is not enough practice. If it is aimed to master the language, then it is needed not only to receive, but also - most importantly - to apply knowledge. Therefore, many teachers recommend immersing themselves in the language environment (Brown and Yule,1983).Surrounded by English speech, learners and involuntarily begin to remember everything we know. We have no choice: otherwise we will not understand anything. So, we consolidate the knowledge gained earlier. When faced with new words and constructs, the brain tries to comprehend them, which often happens successfully in context. So, we get new knowledge. Periodically repeating all this in new contexts, we finally remember and - most importantly - learn to use.

What does use this method mean?

- Understanding speech by ear is improved.

Remember the phrase "My name is John, I live in London," which teachers included at school in an audition? Announcers from these tapes uttered each phrase very clearly - we learned to understand them. But with living people it is more difficult. In films, actors speak in the same way as in ordinary life. If you plan not to limit your circle of communication exclusively to announcers, then you should learn to perceive ordinary speech by ear.

- The vocabulary is expanding.

There are many common words in films and TV shows, you know some of them, and some will be new to you. At the same time, you do not just encounter unfamiliar words, but hear them in context - this helps to better understand and remember the features of their use. Especially if they are phrasal verbs or idioms. And of course, there is a lot of colloquial vocabulary in cinema, which is not in English textbooks. To master the language, you need to cover these words and expressions.

- The correct pronunciation is formed.

Many English words are often mispronounced because they are more often encountered in writing rather than in spoken language. In the cinema, we hear how certain words are pronounced, with what intonation the carriers speak. In addition, you will learn to distinguish between accents, which in the future will facilitate communication with native speakers.

- Grammatical constructs are assimilated.

Learning to use verb tenses, for example, is much easier if you not only read about them in textbooks, but also hear how native speakers use them. Over time, having listened to the heroes of the series, you will learn in your speech to feel where one or another auxiliary verb is needed, and where the article is missing. And another important plus of this method. For a long time, teachers have found that interest in the learning process increases its effectiveness. If you like to watch a movie, then you can successfully combine entertainment and training.

In the practice, once a week we watch a movie in a studio where children of different age categories (*Images 7-8*):



Image 7: Children watch the movie

Recommendations for learners of English through cinema:

Principle 1: choose the optimal volume.

If you are not used to watching a movie in English, then it can be difficult to defeat the whole film in one go.

Principle 2: Choose the optimal level of complexity.

If you do not know the language well and immediately decide to watch a film where the actors speak quickly, with an accent, complex phrases, then such a viewing is unlikely to bring much benefit. And if it is too easy for you, then you will just be glad that you understand everything, but there will be no progress in learning the language. Therefore, it is best to choose videos where it is not too difficult for you, but you experience some difficulties.

Principle 3: Try not to use subtitles.

If your level of English is not zero, then try to forget about Native language subtitles. Without them in any way? Then turn them on at the same time as English and gradually try to move on only to the latter. They can be used if your level is medium and lower. Starting with Intermediate, it is recommended to try to do without any subtitles. The main task is to rely on hearing, and not on written text.

Principle 4: First of all, try to capture the big picture.

You don't need to worry if you don't understand every word. Your task is to understand the general meaning of what has been said. Try to comprehend unknown words and turns by context.

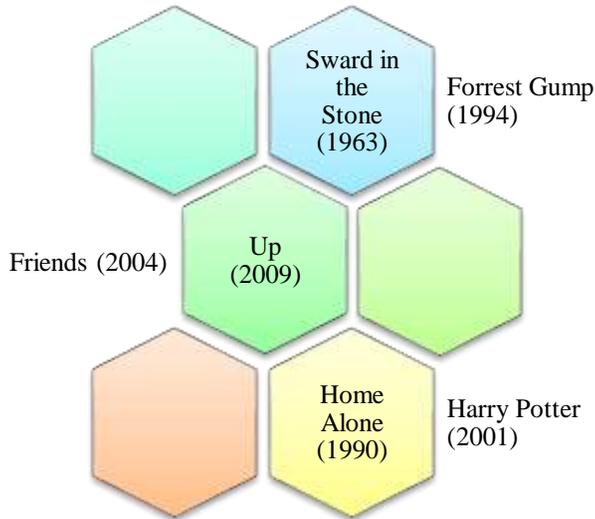
Principle 5: Fix unfamiliar words and expressions to teach them later.

To really expand the vocabulary, new vocabulary must be written out

and repeated periodically.

For the learners of English, It has been compiled a list of films for good and easy study of English from a beginner level (*Appendix 6*):

Table 1: The list of popular movies for studying English



In the course of the practice of English learners, It will considered working with one student. Her name is Daria. She is 3 years old. We started doing English with her when she was 2.4. For six months of work, thanks to the use of cards, watching her favorite cartoons and listening to music, it is learned English at grade 2 level. The girl went around the house and called all the items in English, which contributed to a good memorization of new words and their daily practice.

2.3. Listening to Music in Shaping the Correct Pronunciation

Music is a good source of correct pronunciation and vocabulary learning of any language. There are advantages of learning the language by songs:

1. Increasing your vocabulary!

Let's say you have an average level of English, you understand the texts of modern pop artists and then you decide to listen to the song Sting - Englishman in New York, which has become a classic. Surely you will notice how diverse the vocabulary of a piece of music is, for example: notoriety,

propriety, sobriety. Write down unfamiliar words and phrases, learn them and surprise your English teacher. By the way, thanks to rhymed lines, the lyrics and words from it will be remembered more easily than the vocabulary from the textbook.

2. Studying idioms!

In Linkin Park - Numb, you will hear the line - Put under the pressure of walking in your shoes. How to translate this? With literal translation, something slurred and completely meaningless is obtained. And if you look at the dictionary, you will find out that in someone's shoes is an idiom that means "to put yourself in the place of another," "to understand the feelings of another person."

3.improve your understanding of English by ear!

Listening to any material in English, you are working on listening. Songs are no exception: favorite hits will help you get used to the sound of English speech.

4.Improve your pronunciation!

Listening to a good pronunciation, we involuntarily copy it.

5.Learn English anywhere!

Songs and lyrics to them are easy to find on the Internet, so this is one of the most accessible techniques for improving English.

6. Musical works reflect the culture, mentality and moods of people, as well as the events that take place in the country. Now let's consider examples of songs and their texts to demonstrate the advantages of this method of study (*Appendix 7*):

Table 2: Examples of songs

| Song's name | Song's text | Opportunities |
|--------------------------------|---|--|
| Wake me up - Avicci | Feeling my way through the darkness, Guided by a beating heart I can't tell where the journey will end, But I know where it starts They tell me I'm too young to understand They say I'm caught up in a dream Well life will pass me by if I don't open up my eyes Well that's fine by me So wake me up when it's all over When I'm wiser and I'm older | There are many metaphors for more advanced English learners in the song, as well as quite a lot of repetitions in it, which will help you work out the pronunciation properly. |
| Thinking out Loud – Ed Sheeran | When your legs don't work like they used to before And I can't sweep you off of your feet Will your mouth still remember the taste of my love? | A nice slow song with a repeating chorus and a great option for training imperative (imperative mood) in |

| | | |
|--------------------------------------|---|--|
| | <p>Will your eyes still smile from your cheeks? And darling I will be loving you till you're 70 And baby, my heart could still fall as hard at 23 And I'm thinking about how People fall in love in mysterious ways Maybe it's all part of a plan For me, I fall in love with you every single day</p> | English! |
| Someone you loved – Lewis Capaldi | <p>I'm going under and this time I fear there's no one to save me This all or nothing really got a way of driving me crazy I need somebody to heal Somebody to know Somebody to have Somebody to hold It's easy to say But it's never the same I guess I kinda liked the way you numbed all the pain</p> | The song has a sea of idioms and enduring phrases such as 'let my guard down' and 'pull the rug', great for replenishing vocabulary. |
| Cocomelon | <p>The wheels on the bus go round and round Round and round Round and round The wheels on the bus go round and round All through the town The doors on the bus go open and shut Open and shut Open and shut All through the town The wipers on the bus go swish swish swish Swish swish swish Swish swish swish swish Swish swish swish Swish swish swish swish The wipers on the bus go swish swish swish All through the town The signals on the bus go blink blink blink Blink blink blink Blink blink blink</p> | Ideal for learning words with younger children. Colorful pictures and pleasant music. |
| ABC song | <p>Aa-Bb-Cc-Dd-Ee-Ff-Gg Hh-Ii-Jj-Kk-Ll-Mm-Nn-Oo-Pp Qq-Rr-Ss, Tt-Uu-Vv Ww—Xx, Yy-and-Zz, Now I know my A-B-C Come on now and sing with me.</p> | Forget that the alphabet is just a set of letters! This song turns it into a vivid series of associations, in which for each letter there is a |

| | | |
|----------------------|--|--|
| | Aa-Bb-Cc-Dd-Ee-Ff-Gg Hh-Ii-Jj-Kk-Ll-Mm-Nn-Oo-Pp Qq-Rr-Ss, Tt-Uu-Vv Ww—Xx, Yy-and-Zz, Mother will be pleased with me Now I know my A-B-C. | different object in the house. Thus, the baby will be able to remember a lot of simple words. |
| I see something blue | I see something blue. Blue! I see something blue. Blue, blue, blue, blue... I see something blue. Find something blue! Yellow! I see something yellow. Yellow! I see something yellow. Yellow, yellow... I see something yellow. Find something yellow! Red! I see something red. Red! I see something red. Red, red, red, red... I see something red. Find something red! Purple! I see something purple. Purple! | This song contains small interactive pauses in which the child needs to find items of a given color in the picture. In the future, you can play a similar game with him: name the color and look for it around. |
| Greeting song | Good morning, good morning, good afternoon. Good evening, good evening, good night, good night. Nice to meet you. Nice to meet you, too. Good bye, Good bye, see you. Good morning, good morning, good afternoon. Good evening, good evening, good night, good night. Nice to meet you. Nice to meet you, too. Good bye, Good bye, see you. Good morning, good morning, good afternoon. Good evening, good evening, good night, good night. Nice to meet you. Nice to meet you, too. Good bye, Good bye, see you. | We propose to introduce a new domestic tradition of greeting each other in English. For example, ask "how are you?" and answer. From the following song, children can learn the main greeting phrases: |

There is a method of learning the language by song (<https://englex.ru/6-websites-for-learning-english-with-songs>):

- Choosing a song

First, select the song you want to work with. There can be only one selection criterion: you should like the song, because you will have to listen to it 3-5 times in a row. If you have difficulty perceiving English by ear, we can advise you to dwell on a composition that is performed at a slow or medium

pace to make it easier for you to make out the words.

- Trying to understand the text

Listen to the composition, trying to understand the maximum words. At the same time, you need to listen not only to the text, but also to the intonation of the artist - this will also help you to understand the meaning of the song. If you have chosen a new composition for yourself, listen to it twice to catch the essence.

- It is listened and read the text

Listen to the song and at the same time read its text (you can simply include subtitles), while trying to understand each word in the performer's speech, you can even listen to illegible excerpts several times.

- It is written out unfamiliar words
- Listening to the song without lyrics

It is listened to the song again and, without spying on the text, it is tried to make out every word of the artist by ear and remember what the new words mean. At this stage, you must already fully understand the text.

3. Attitudes of Teachers about Non-formal Education

The training strategy for teachers in formal, informal and informal education is aimed at: obtaining a high quality education that provides the opportunity to form the professional competencies necessary for the practical activities of the teacher, acquiring strong skills and skills that increase the competitiveness of the graduate and contribute to the development of a professional career. In education, as in other spheres of life, certain changes occur:

- the model of education, which includes three levels: bachelor's, master's and graduate school (formal education);
- a process that truly runs throughout life, in which everyone acquires views, values, skills and knowledge from everyday experience and gains educational influence from the resources of his environment;
- ranging from family and neighbors, from work and games, from the market, library and media (informal education);
- a separate activity or a substantial part of a wider activity designed to serve the subjects of training and realizing the goals of training (informative education).

These changes require the formation of a new type of teacher, not only performing educational and educational functions, but also able to respond in a timely manner to changes in the labor market, the requirements of society and a changing society. Recently, there has been an expansion of the teacher's role repertoire. Along with traditional roles (teacher-organizer of educational activities, teacher educator and teacher - mentor), the teacher has the need to fulfill such roles as tutor, moderator, facilitator. The transformation of the roles of the teacher "is due to the influence of external and internal factors, innovations within the professional spheres, where the problems of formal, informal and informal education, individual educational trajectories of the teacher are updated" (Ройтблат, 2011: 127).

Consider the new roles of a modern teacher, which include innovative ideas and approaches in his educational and psychological and pedagogical activities. There are many opinions on the problem of tutoring. Tutor - mentor, mediator, person who teaches to independently solve problems (translate them into tasks); this is a position accompanying, supporting the process of self-education, individual educational search; a culture that was formed in history in parallel with the culture of teaching and learning. However, tutoring in modern conditions of the development of the education system takes on a broader meaning. The tutor accompanies a person in his mastery of the methods of new activity and appears in the educational space of the school as a result of the appointment and assignment of him to a certain group of students, or as a result of the choice of the tutor to the students themselves (Doronina, 2012: 33).

There are several types of tutoring:

1. The training tutor is engaged in tutoring. The object of his activities are groups of school students experiencing difficulties in educational activities.
2. The tutor in research activities accompanies and contributes to the development of the technology of this activity for students, helps in the design and presentation of results (contests, conferences).
3. Tutor in project activities masters with students the technology of writing projects, posing problems, seeing problems in society, as well as finding options for ways and ways to solve them.
4. The Tutor-Social Producer carries out activities to organize social and educational practices for students, professional trials, excursions to enterprises, meetings with specialists of various professions, school days in

universities and university days in school, visiting the fair of educational places "Education and Career."

5. Tutor - a psychologist forms a psychologically comfortable environment for school students and teachers.

6. A tutor on professional self-determination motivates students to achieve the desired, declared result (Chaney and Burk, 1998).

Organizational forms of student tutoring include:

- An intergrowth tutoring group, including several small tutoring groups consisting of students in grades 6-8 of the school, united in groups around their tutoring. Student tutoring is built mainly around the collection of portfolios and presentations of their work. A difficult task in providing tutoring support within the framework of an inter-age tutoring group is the problem of integrating tutoring support and the educational space of a teenage school.

- The class (group) of tutoring support creates a situation of constant and diverse involvement of a teenager in the program of tutoring support, which is built as the development of significant objectivity with an emphasis on portfolio collection and project implementation. Student tutoring is carried out at two levels: individual support by a personal tutor and class support as a whole by a class tutor. The effectiveness of this model of tutor support is associated with: highlighting a special intermediary position "class tutor"; building tutorial accompaniment as the context of class life; study of the event series of tutoring at the levels of individual history, group history and class history.

- The club of educational routes (travels) is created for a specific expedition (cognitive action, educational question) and as a possible option for his life, the complete dissolution of the first composition and the recruitment of a new one after the presentation were considered. The organization of tutoring support is characteristic: 1) the club form of the organization; 2) consideration as sources of education of any organizations engaged in both educational (for example, a museum) and any other activities (a store, a sports club, a fire department, etc.); 3) availability of an expeditionary stage - a real (maybe virtual) trip to sources of education selected in accordance with their own interests, during which targeted collection of information is carried out according to a previously developed plan; 4) the presence of a group of associates with whom some similarity of interests and the general place of the expedition unites (Колычевой, 2012:3).

The main elements of moderation technology include: Interaction (organization of interaction between students or pupils). The teacher at the stage of planning a lesson or educational event should provide and lay in the plan mechanisms for effective interaction, and in the course of a lesson or educational event they should be implemented efficiently.

Communication. Effective interactions are impossible without organizing an orderly exchange of information between all participants in the educational process. Communication is a means of sharing information, knowledge, as well as expectations, moods, feelings that are conveyed to a partner in conversation or in non-verbal communication. The organization of bilateral and multilateral discussions (dialogue and polylog), the use of various channels and forms of communication, the use of methods to stimulate the communication process - all this makes it possible to ensure the effectiveness of interaction.

Visualization. Visualization of the stages of the educational process makes it possible to materialize the course of education and education, makes it possible to "touch" the results and achievements of students (pupils). Colorfully designed presentations create a high mood among students (pupils) and the teacher, a festive atmosphere and a positive motivational field in the class or group. Connecting visual memory will provide increased survival of knowledge.

Motivation. Maintaining tone, developing self-confidence and positive attitude of all participants in the educational process, stimulating cognitive activity and creative process, revealing and developing the abilities of students, promoting their effective cooperation - the catalyst for these processes is motivation.

Monitoring of educational process. Monitoring the educational process includes tracking and reconciliation of the results of each section of the lesson with the planned ones, as well as formal and informal recording of the progress and results of the educational process and making adjustments as necessary during the lesson. In the process of moderation, it is very important to monitor two processes: the implementation of the lesson plan and group dynamics.

Monitoring the educational process includes tracking indicators of the degree of education:

- 1) motivational and value attitude towards one's personality and others;
- 2) a system of values expressed in various spheres of interest;

- 3) level of intellectual development, circle of cognitive interests;
- 4) the level of formation of moral culture;
- 5) level of development of communication skills and skills;
- 6) personality focus (on oneself, on communication, on business);
- 7) the level of formation of operational skills (organizational qualities of the individual).

Reflection. Understanding new knowledge, skills, qualities and values, critical analysis of information, generating responses to environmental challenges, as well as self-assessment of oneself, one's behavior, one's role, one's contribution to the process of group work, adjustment of one's activities based on this assessment and the needs of the group is a mandatory attribute of modern education.

One of the hallmarks of modern reality, which is perceived by teachers with difficulty, is the gradual death of old professions and the increase in the number of new, unusual and unusual. This process is accompanied by rather tough competition. There is always someone who is faster, stronger, more creative and in some ways better than us. We begin to try to frantically retrain, but purely physically we cannot have time for everything. If this happens in our life, it is advisable to start looking at it from the position of holism (from the ancient Greek "whole, whole"; in a broad sense - a position in philosophy and science, proceeding from the qualitative originality and priority of the whole in relation to its parts). When we begin to look at life from the point of view of a holistic approach, we notice that for a person it is tantamount to achieving success (balance, happiness - call it to your taste) in four dimensions: the physical world, the emotional world, the mental world and the spiritual world (the world of deep meanings). The union of these spaces gives rise to a holistic and stable experience of life satisfaction.

The next step is to form competence: conscious or unconscious. In this process, it is important to understand that all its stages are cyclical: for example, for speed and automatism, you have to pay for the lack of control over the details. Paradoxically, a higher level is not always optimal for performing certain job duties. There is no "final growth point" here: the process develops in a spiral.

And finally, it is worth emphasizing the important difference between an adult and a teenager: an adult does not seek to "try everything and at once," he knows that the energy resource is limited, so he consumes it rationally. The

target audience of teachers is the same, only practices are different. In order to select and subsequently apply the best of them, it is necessary to regularly exchange experiences at sites intended for non-formal education. This means that partnership in the modern world, especially in the educational sphere, is much more important than competition.

3.1. The Role of Private Schools and Kindergartens in the Formation of Free Communication Skills

There are two main differences - the compilation of a methodological program and the organization of the educational process. The latter is probably defining. In a private school, the whole system is built on an individual approach to each child. There are from 4 to 6, rarely 7 people in the foreign language group, which gives the teacher the opportunity to interview each student in the lesson, constantly monitor the progress of students, and monitor their progress. At each lesson, the teacher has enough time to discuss the material passed with each child, pay attention to the nuances, and jointly find out the controversial points. This promotes a very close student-teacher bond.

In a private school, there is no obligation to build an educational process based on the methods of only authors according to the methodology. A comprehensive approach to this issue, using foreign manuals of foreign authors, a variety of grammatical and lexical manuals, materials for preparing for international exams and the Unified State Exam in a foreign language.

The school provides an opportunity to create a fairly rich resource-center of foreign literature of modern authors and classics in the original language, manuals of foreign methodologists on teaching a foreign language by non-speakers of the language. The school has a bank of educational video and audio materials, feature films, books on the history and culture of the countries of the language being studied.

In a private school, lessons with a native speaker are necessarily organized, which gives huge advantages to the development of communication skills of students, provides the opportunity to model real situations of communication and immersion in the language environment. Learning English begins in the kindergarten group created at the school. Children study animal names, colors and some basic grammatical constructions twice a week in a playful manner. Direct study of the first foreign language under a specialized program begins with the second half of the first class, and the study of the second foreign language begins with the

fifth grade. As years of study increase, the number of study hours increases.

4. CONCLUSION

In the course of the research and experiences, It was highlighted the features of working with methods of informal education, the basic principles and made recommendations. The school as an educational organization, its culture, way of life, organization of life, traditional ways of implementing various areas of activity, communication, relations are quite informative. You can distinguish:

- information of an activity-role nature, including values, norms, patterns of behavior and methods of implementation of activities cultivated in the school and the main role repertoire (how to behave in school, how to communicate with a teacher, how to resolve conflicts, how to resist negative influences from high school students, how to live in a team, etc.);

- information of organizational and managerial (power) nature, including information on compliance, status characteristics of various members of the school community, as well as on the norms of power and subordination adopted in this school, style and management system. Each student, using various mechanisms (imitating, identifying, focusing on symbols of power and subordination, assigning norms and standards of behavior, assimilating views and beliefs, etc.) finds out his place in the system of power relations, determines legitimate and illegitimate ways of advancement in the power hierarchy;

- information on norms and values of relations with the external environment (trust and openness, alienation and distrust, opposition of "we" - "they," etc.);

- spiritual and practical information: norms, values, methods, styles, etc., self-expression, leisure activities, relations between representatives of the opposite sex, attitude towards representatives of other age and social groups, attitude to reference personalities and informal leaders of groups.

An important role is played by the general focus of life, which can be:

1) individualist, built on the priority of personal achievements, satisfying personal needs. The characteristics of school life are:

- non-interference in personal life, connivance, organization of practice, in which you can only hope for yourself and it is necessary to independently defend your own interests, protect yourself,
- calculation of individual initiative of each (and in fact - individual)

- members of the school community,
- distance in interpersonal relations;

2) collectivist, group-oriented activity. A distinctive feature is the clearly expressed group identification of the individual, accompanied by a certain positively colored emotional attitude, pride in one's own membership. The characteristics of school life are:

- perception of the school as an educational organization ready to represent, support and protect the interests of every member of the school community,
- impact of success or failure of the school, class on the well-being of its members,
- cohesion, close interpersonal and intergroup contacts,
- the regulatory mechanism is a sense of duty, moral obligations.

It should be borne in mind that education in the process of inclusion in the life of a school to a greater extent than systematic education is subject to the effect of distortion of information.

Distortions - situations in which information is received by the consumer that is not adequate to the real one. They may be unintentional (lack of information, lack of readiness of the child due to age or individual characteristics to adequately perceive this information, ambiguity of information, difficulty in the mechanisms of information transfer, etc.) conscious (making amendments that deliberately distort the content of information, as a rule, due to disagreement with the content of information or in order to use the situation in their own interests), filtering (cutting off part of information for various purposes, resulting in simplification of information, rearrangement of accents, change of emotional background, etc.).

It must be stated that in a modern school this component of the education process is not paid enough attention. So, only in recent years began to pay attention to the obvious presence in the school of the so-called hidden (secret) content of education, actively consumed by children throughout school life.

The emergence of informational and informal learning is a direct consequence of the development of new network information and communication technologies that overcome spatiotemporal boundaries, providing instant access to any information that expands ideas about the reality of everyday life, which now includes the virtual reality of the Internet.

In this regard, there is an increasing need to pay more attention to educational models such as informal and informal education. With a number of advantages, they are able to become, along with formal education, the core elements of the educational system.

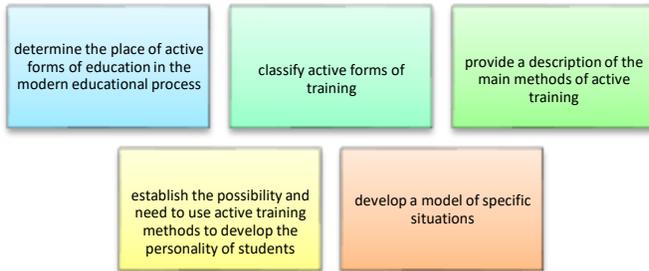
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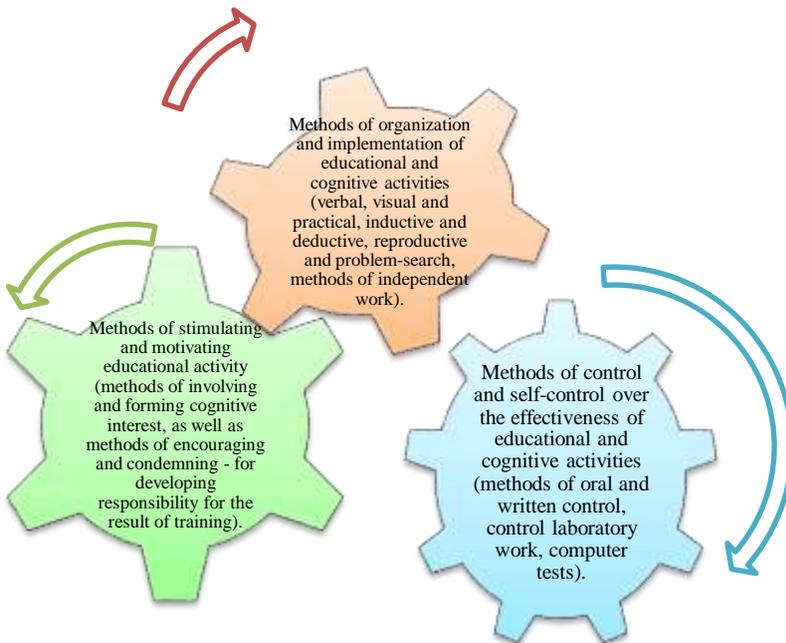
INTERNETLINKS

<https://englex.ru/6-websites-for-learning-english-with-songs/>

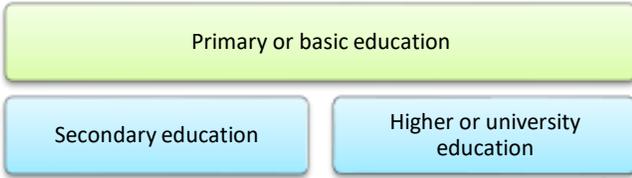
Appendix 1



Appendix 2



Appendix 3

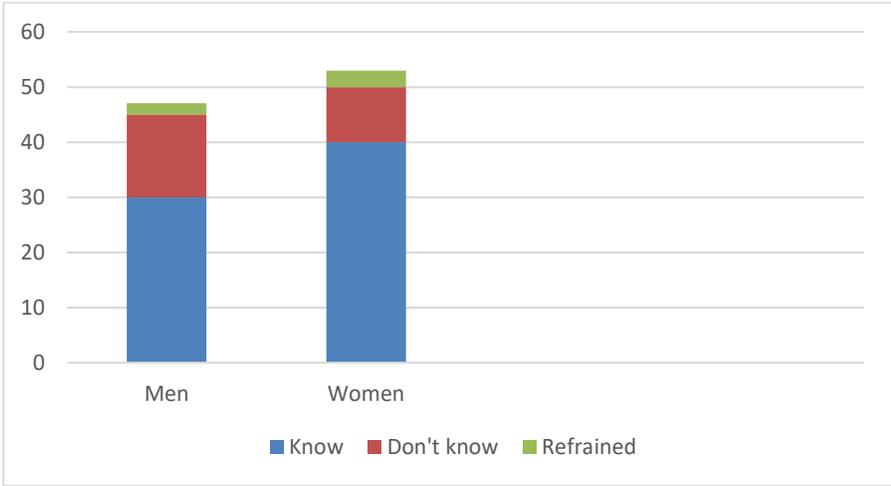


Appendix 4

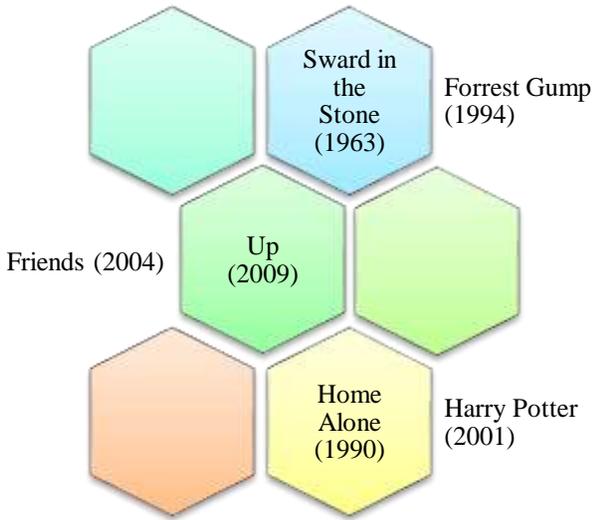
Interview Items

| | |
|---|--|
| Name, Surname | |
| Age | |
| Sex | |
| City, village | |
| Do you know about non-formal education? | |
| Do you like this method or no? | |
| Do you know examples of practices of non-formal education? | |
| How can we develop this direction in our region? | |

Appendix 5



Appendix 6



Appendix 7

| Song's name | Song's text | Opportunities |
|-----------------------------------|---|--|
| Wake me up - Avicci | Feeling my way through the darkness, Guided by a beating heart I can't tell where the journey will end, But I know where it starts They tell me I'm too young to understand They say I'm caught up in a dream Well life will pass me by if I don't open up my eyes Well that's fine by me So wake me up when it's all over When I'm wiser and I'm older | There are many metaphors for more advanced English learners in the song, as well as quite a lot of repetitions in it, which will help you work out the pronunciation properly. |
| Thinking out Loud – Ed Sheeran | When your legs don't work like they used to before And I can't sweep you off of your feet Will your mouth still remember the taste of my love? Will your eyes still smile from your cheeks? And darling I will be loving you till you're 70 And baby, my heart could still fall as hard at 23 And I'm thinking about how People fall in love in mysterious ways Maybe it's all part of a plan For me, I fall in love with you every single day | A nice slow song with a repeating chorus and a great option for training imperative (imperative mood) in English! |
| Someone you loved – Lewis Capaldi | I'm going under and this time I fear there's no one to save me This all or nothing really got a way of driving me crazy I need somebody to heal Somebody to know Somebody to have Somebody to hold It's easy to say But it's never the same I guess I kinda liked the way you numbed all the pain | The song has a sea of idioms and enduring phrases such as 'let my guard down 'and' pull the rug ', great for replenishing vocabulary. |
| Cocomelon | The wheels on the bus go round and round Round and round Round and round The wheels on the bus go round and round | Ideal for learning words with younger children. Colorful pictures and pleasant |

| | | |
|----------------------|---|---|
| <p>Greeting song</p> | <p>Good morning, good morning, good afternoon. Good evening, good evening, good night, good night. Nice to meet you. Nice to meet you, too. Good bye, Good bye, see you. Good morning, good morning, good afternoon. Good evening, good evening, good night, good night. Nice to meet you. Nice to meet you, too. Good bye, Good bye, see you. Good morning, good morning, good afternoon. Good evening, good evening, good night, good night. Nice to meet you. Nice to meet you, too. Good bye, Good bye, see you.</p> | <p>We propose to introduce a new domestic tradition of greeting each other in English. For example, ask "how are you?" and answer. From the following song, children can learn the main greeting phrases:</p> |
|----------------------|---|---|

CHAPTER 3
DEVELOPING A PCK TEST:
PSYCHOMETRIC PROPERTIES
OF THE KNOWLEDGE OF TEACHING FUNCTIONS TEST¹

Assist. Prof. Dr. Nurullah ŞİMŞEK²

Assoc. Prof. Dr. Nihat BOZ³

¹ This paper is based on PhD study of the 1st Author under the supervision of the 2nd Author.

² Kırıkkale University, Faculty of Education, Department of Mathematics and Science Education, Kırıkkale, Türkiye, nsimsek@kku.edu.tr, <https://orcid.org/0000-0003-2536-8285>

³ Independent researcher, Ankara, Türkiye, nihatsby@yahoo.co.uk, <https://orcid.org/0000-0002-1937-8084>

INTRODUCTION

Teaching as a profession requires special skills and knowledge. Therefore researchers have great interest in studying teachers and prospective teachers. These studies examine and discuss how to educate and train teachers. There are questions whether or not just having a sound subject matter knowledge (SMK) assures being a quality teacher. Currently it is almost commonly agreed that teachers need special kinds of knowledge. Pedagogical content knowledge (PCK) was defined by Shulman in 1986s and now it is regarded as a special kind of knowledge that differentiates subject matter specialists and teachers. Though there are controversies on its structure and nature it keeps its attractiveness in the literature.

On one hand there are researchers who try to understand and conceptualize PCK as a construct, on the other hand researchers try to develop tests that assess or measure PCK. In this study we report a part of a PhD study that aimed to develop a multiple choice PCK test and use this test to compare prospective mathematics teachers' PCK who are enrolled to different kinds of teacher education programs.

In our context there are different paths for being a secondary school mathematics teacher. There are education faculties and arts and science faculties. Secondary school science and mathematics education departments aim to raise mathematics and science teachers. On the other hand arts and science faculties aim to raise scientists and mathematicians. However, those arts and science faculty students who want to be a teacher can enroll to Certificate of Education programs provided by education faculties. They can attend to these programs either after graduation or during their undergraduate study. Hence in author b's PhD study we aimed to compare PCK knowledge of prospective teachers from different sources in the context of functions b means of a multiple choice test. In this paper, we will report about our experiences and steps we went through in developing Knowledge of Teaching Functions Test (KTFT). Furthermore we will report KTFT's psychometric properties. We used both Item Response Theory (IRT) and Classical Test Theory (CTT) in developing KTFT. We will present our analysis according to both of these theories.

The research question of this paper can be stated as below:

“What are the psychometric properties of KTFT?”

By answering this question we add support to the studies that aimed to develop quantitative data gathering instruments which are more economical, usable in large samples, generalizable and having psychometric

properties. Hill, Ball and Schilling (2008) pointed out the scarcity of studies that focus on measuring PCK by means of psychometric tests. This scarcity still remains, although there are some projects that deal with PCK test development (LMT, COACTIVE, DTAMS, TEDS-M).

Theoretical Background

Lee S. Shulman is the first scholar who used the term Pedagogical Content Knowledge (PCK) in a meeting of American Educational Research Association in 1985. He defined PCK as an amalgamation of subject matter knowledge and general pedagogical knowledge. He claims that PCK is a special kind of knowledge that teachers possess and that differentiates teachers from subject specialists. Shulman (1986) claimed that PCK

“.... goes beyond knowledge of subject matter per se to the dimension of subject matter knowledge for teaching. I still speak of content knowledge here, but of the particular form of content knowledge that embodies the aspects of content most germane to its teachability (p.9).”

Shulman’s propositions have been attracting attention of the researchers since then. Therefore there is vast amount of literature on PCK. There are criticisms of PCK too. Depaepe, Verschaffel and Kelchtermans (2013) reported these criticisms under five headings: (1) PCK has inadequate theoretical and empirical foundation for being a separate category in the knowledge base of teacher. (2) Shulman describes PCK as a factual knowledge type that can be achieved and used independently of classroom context. (3) There are doubts among researchers on whether PCK can be separated from content knowledge empirically and theoretically. (4) Shulman conceptualized PCK in a very narrow frame, just in two categories. (5) Since PCK depends on cultural differences it has no certain shape.

The researchers have studied to address these criticisms. Shulman’s colleagues (Grossman, 1990; Marks, 1990) expanded the PCK model. While Grossman (1990) defined PCK by decomposing it into four components, Marks (1990) conducted research in mathematics education and constructed components of PCK based on empirical findings. Marks (1990) decomposed PCK into following components: (1) Students’ understanding, (2) Media for instruction, (3) Subject matter, (4) Instructional Processes.

Like Grossmann (1990) and Mark (1990), researchers carried out empirical studies in order to understand the nature and the structure of PCK by referencing Shulman. For example Cochran, DeRuiter and King (1993) used the term “knowing” instead of “knowledge” to emphasize the dynamic

nature of PCK. They criticized the term “knowledge” for also not being suitable to constructivist “terminology”. Therefore they used the term Pedagogical Content Knowing.

Gess-Newsome (1999) defined PCK by means of two models; transformative model and integrative model. Transformative model states that subject matter, pedagogical, contextual and all the other knowledge that are needed to be a teacher transformed into a new type of knowledge. This new knowledge is PCK that is required for instructing students. On the other hand integrative model states that teacher selects from combination of subject-matter, pedagogical and contextual knowledge in order to teach. Thus integrative model does not treat PCK a separate component of teacher knowledge base rather it recognizes PCK as a container of SMK, pedagogy and context.

In order to make PCK more tangible in the context of science education Park and Oliver (2008) defined a new PCK model by referencing the previous studies of Magnusson et al. (1999) and Grossman (1990). They separate PCK firstly into two dimensions; knowing and applying. They further divided the PCK into 6 components: (a) suitability to science education, (b) knowledge of assessment, (c) curriculum knowledge, (d) knowledge of teaching strategies, (e) knowledge of understanding students, and (f) teacher self-efficacy beliefs.

The framework that paved the way for measuring PCK empirically by means of psychometric tests in mathematics education context was created by Hill, Ball and their colleagues (Ball et al 2008; Hill et al., 2008; Hill et al., 2005). These scholars based their frameworks on Shulman’s definition and created a more overarching model which they called “mathematical knowledge for teaching (MKT)”. MKT model has two domains: SMK and PCK. SMK has three components: (a) Common Content Knowledge (CCK), (b) Knowledge at the Mathematical Horizon, and (c). Specialized Content Knowledge (SCK). Similarly PCK has three major components: (a) Knowledge of Content and Students (KCS), (b) Knowledge of Content and Teaching (KCT), and (c) Knowledge of Content and Curriculum. One of the most important contributions of MKT framework is that it encourages researchers to construct psychometric tests for measuring PCK.

Although the studies on PCK produced various frameworks and provided theoretical bases for PCK, they could not put a communal definition. In order to alleviate differences among PCK frameworks 22 science educators from 11 different research teams and 7 different countries organized a PCK

summit in the USA in 2012. As a result of this summit, they created the following teacher knowledge base model (see Figure 1).

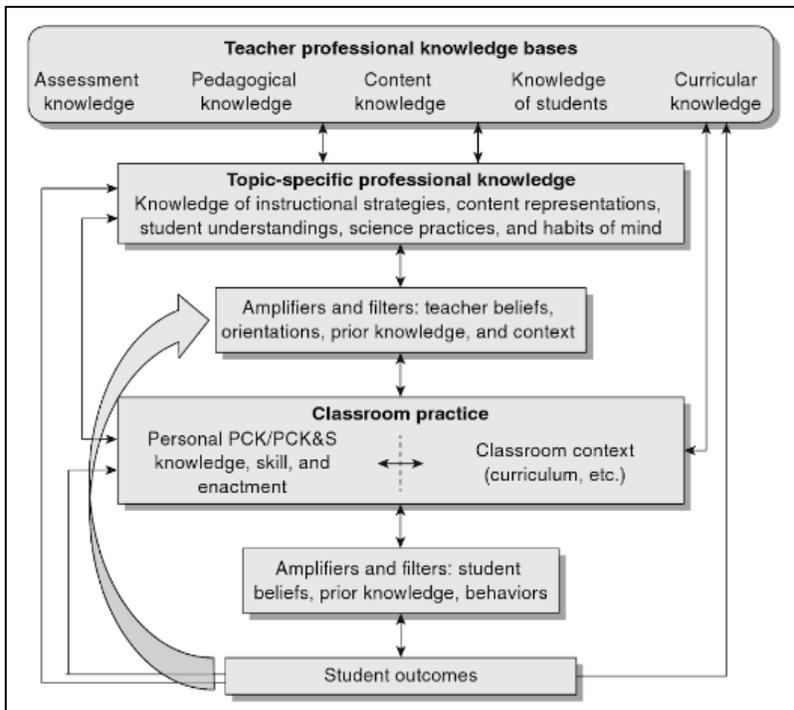


Figure 1. Model of teacher professional knowledge and skill including PCK and influences on classroom practice and student outcomes (Gess-Newsome, 2015, p. 31)

From these discussions we can deduce that either separate or not there should be a special type of knowledge teachers need to use for accomplishing their teaching duties. Therefore researchers, education institutions and all professional stakeholders of education require objective methods of assessing and measuring this type of knowledge.

The first studies in this domain aimed to understand PCK and find empirical support for PCK theory. Therefore they used mainly qualitative approaches. Recently researchers shift their attention to the development of objective and reliable tests for measuring PCK. Baxter and Lederman (1999) reported assessment methods of PCK research under three headings: (i) concept map, card sorting and pictures, (ii) triangulation, (iii) convergent and inferential techniques. However, there are serious criticisms about concept maps and card sorting techniques (Baxter & Lederman, 1999).

Aydın and Boz (2012) reported that in science education the researchers preferred mostly the triangulation method. Similarly in mathematics education this method is the favorite (Şimşek and Boz, 2016). In triangulation, the different combinations of interviews, observations, lesson plans, and vignettes were employed.

Convergent and inferential methods include Likert type scales, multiple choice tests and short answer questions. These formats are used mainly for measuring teachers' attitudes and beliefs. Although there is a growth recently, there is scarcity of studies that use multiple choice tests for measuring PCK.

Measuring PCK by means of Tests/Scales

Four major project groups working on teacher knowledge that use scales and tests are: (i) LMT (Learning Mathematics for Teaching), (ii) DTAMS (Diagnostic Teacher Assessments in Mathematics and Science), (iii) COACTIV (Cognitive Activation in the Classroom), and (iv) TEDS-M (Teacher Education and Development Study in Mathematics). LMT, COACTIV and DTAMS are national studies, however TEDS-M is an international study supported by the International Association for the Evaluation of Educational Achievement (IEA). As Aydın (2014) reports in TEDS-M project there were prospective elementary school class teachers and secondary school mathematics and science teachers from 17 countries. In order to test SMK of prospective mathematics teachers, the topics included in the test are: numbers, algebra, geometry and data. Three sub-domains of PCK are tested: curriculum knowledge, knowledge of planning for teaching and learning, and knowledge of mathematics for teaching and learning.

In DTAMS for measuring PCK and SMK of prospective secondary mathematics and science teachers, a team of teachers, maths/science educators and mathematicians/scientists developed 6 different tests that had 10 multiple choice and 10 open ended questions. They used three strategies to satisfy the test reliability. Firstly, they determine the depth and the extent of the knowledge required to be a mathematics teacher. They based this determination on national recommendations, standard tests objectives, and studies related to misconceptions of students and teachers. Secondly, teams composed of mathematicians, mathematics educators, and teachers constructed a summary of secondary school mathematics content and they constructed original assessment questions parallel to this content summary.

Thirdly, they employed national critics to evaluate the suitability of the questions.

1600 teachers took the test. The data obtained from 1600 teachers was used to find reliability scores. They employed three different statistical reliability tests. Cronbach Alfa reliability coefficient for internal consistency, Pearson product-moment correlation coefficient for Equivalence reliability, intra-group correlation coefficient and agreement percentage of three scores for inter-scorer reliability are calculated (Saderholm et. al., 2010).

Teaching and Learning Function Concept

The previous literature review was about PCK without any specific mathematical topic. In this part we will discuss studies about the place of functions in school curriculums, students' difficulties and alternative conceptions they face and construct in their journey to learn functions.

Function concepts are related to all topics in mathematics especially to sets, relations, limit, derivative, continuity and transformative geometry. Therefore, functions constitute the core of curriculums in many countries. For example there are four attainment targets in 9th grade, seven targets in 10th grade and 11th grades in mathematics curriculum (Ministry of National Education, 2013). These targets are related to topics such as definition of functions, even and odd functions, inverse functions, composition of functions, function applications, graphs of functions, function types etc.

In learning these functions topics, there are various difficulties and alternative conceptions; these are well documented in the literature. For example, Bayazit (2008) documents and classifies these difficulties and conceptions. In order to report these briefly we present the following list: (1) Students regard functions as one-to-one relations. Therefore they don't think a relation that relates an element in domain to more than one element in co domain as a function. (2) Similarly, students accept one-to-one relations that are not well-defined as functions. (3) Students think that all graphs of functions must be smooth, continuous curves or lines. (4) There is a tendency among students that all algebraic expressions that contain x and y 's are functions. (5) The circle symbol " \circ " used in function composition is regarded as multiplication symbol. (6) Similarly, the " -1 " symbol to show inverse of functions (f^{-1}) is regarded as multiplicative inverse. (7) Constant functions are not regarded as functions etc.

The PCK studies in the context of functions date back to 1993s. For example, in her qualitative study, Even (1993) examine the relation between SMK of functions and PCK of functions, Ebert (1993) tried to define the structure of PCK in the context of functions and graphs. Even and Tirosh (1995) investigated the relation among knowledge about students, SMK and knowledge of instruction in order to discuss the nature of PCK. Sanchez and Llinares (2003), Lucus (2005), Zou (2014) can be listed among the studies that study PCK in the context of functions. All these studies used qualitative research methods. We find them useful to construct our PCK test, especially to write items of the test.

1. METHOD

Since this paper is based on Author b's (2016) PhD study, its research model was casual comparative. In this casual comparative study a multiple choice test was constructed and used to fulfill the aims of that PhD study. PhD study aimed to compare PCK knowledge of prospective teachers from different sources. Gender is another factor that was used to compare PCK. Since space limitations, in this part we present the methods we followed in test construction. We took the similar steps that were explained in Downing (2006) for test construction. As can be seen from this figure 2 we went through a lengthy process of developing our PCK test. These steps took approximately two years. We conducted three pilot studies. We closely worked with the experts in PCK, test development, and language.

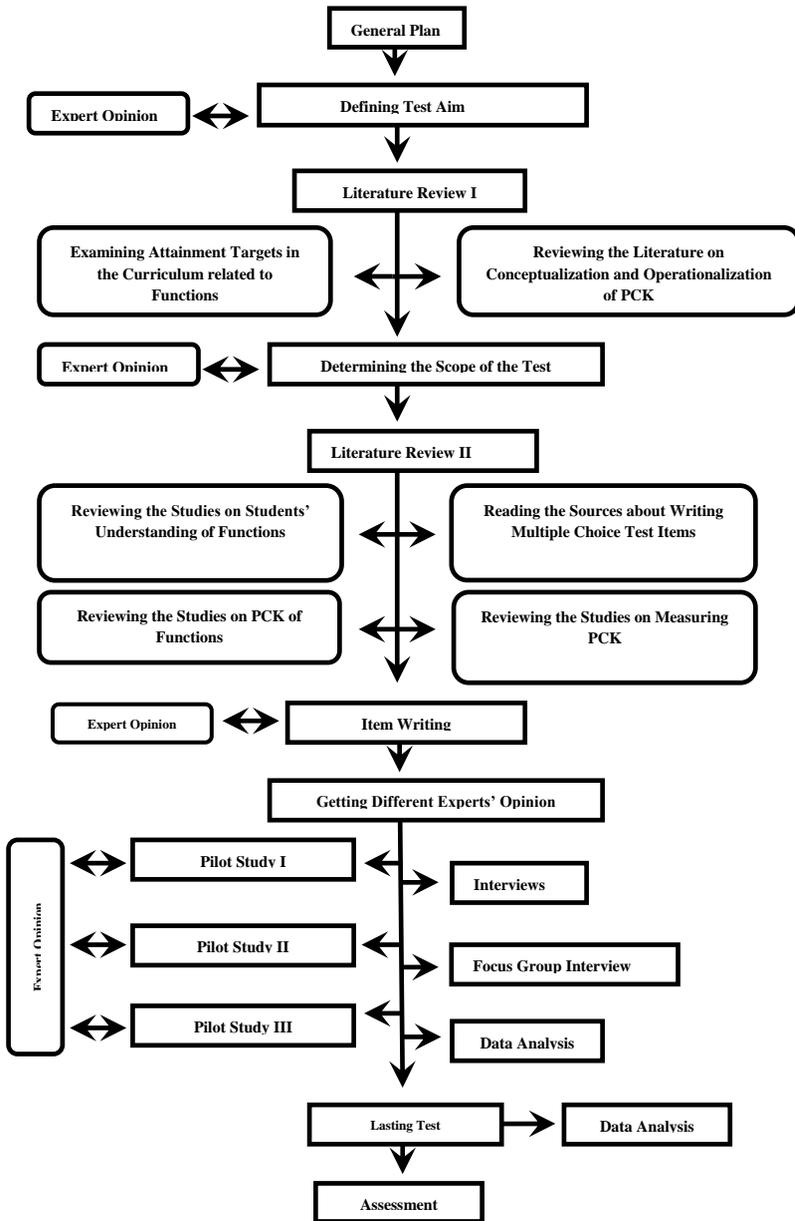


Figure 2. The making of KTFT: its steps

The aim of the test was to measure the knowledge of teaching functions of prospective teachers. Therefore we named the test “the Knowledge of Teaching Functions Test (KTFT)”. We began by determining the content and the scope of the test. In shaping the scope of the test with regard to functions we scanned the curriculum and selected the attainment targets according to the following two criteria: (1) The selected function targets should be the fundamental and prerequisite to other targets. (2) The target should be reported as students facing the most difficulties and misconceptions in the literature.

Thus, we limited the scope of the test by these two learning targets: *functions and their representations and composition of two functions and inverse of functions*. As can be seen from these topics they are prerequisite to other function topics and fundamental to understanding functions.

In order to determine the scope of the test regarding PCK, we focused on its components. From these components we selected three of them to include in the test. Our rationale in this selection based on the following issues: (1) Must be the most accepted PCK component by researchers in this domain, (2) Must be regarded as the core and the most important components of PCK, (3) Must have the rich literature about it. (4) Must be approved by two experts (scholars having PhD thesis on PCK)

We used Park and Oliver’s (2006) table of PCK components defined by different researchers from Shulman (1987) to Ball et. al. (2008). We noticed from this table that following two components are the most popular among the scholars in this field: (1) *knowledge of instructional strategies and representations*, (2) *knowledge of students’ understanding*. Later we agreed to add the following component to the test. (3) *curriculum knowledge*.

In the literature it is commonly agreed that “*knowledge about students’ understandings*” component of PCK should include knowledge about students’ alternative conceptions (misconceptions). They operationalize this knowledge in terms of actions such as *awareness, diagnosis, defining and analyzing*. Thus, in this study we base our conceptualization of PCK’s this component on students’ misconceptions. In order to measure this knowledge, we put questions in the test whether prospective teachers *analyze and identify* given students’ incorrect answers/solutions presented in vignettes.

Knowledge of instructional strategies and representations takes jointly the central place in PCK. This knowledge component includes knowing how to transform complex mathematical topics into understandable representations, that is knowing how to present mathematics in teaching.

Thus, we agree with Ball et. al. (2008), Magnusson et. al. (1999), Fennema and Franke (1992) that this component includes knowing the best operational representations of mathematical concepts, knowing factors that make understanding these concepts easier or more difficult, knowing analogies, examples, representations, and explanations that help teaching and knowing strategies and examples for helping students to correct their alternative conceptions. In order to operationalize this knowledge, the scholars (Krauss et. al., 2008, Saderholm et. al., 2010, etc.) collectively regard following actions as the basis of this component: (1) Making particular mathematical topics understandable to students by suitable analogies and representations. (2) Using appropriate strategies peculiar to the topic. (3) Using suitable strategies to alleviate students' alternative conceptions.

In a similar vein we operationalize this PCK component as determining the appropriate strategies for teaching function concept and alleviating students' alternative conceptions that they constructed in their journey to learn functions.

In the literature *curriculum knowledge*, is one of the components that most frequently takes place among components of PCK. Although Shulman (1986) did not place curriculum knowledge in PCK, a great deal of researchers (Ball et. al., 2008; Geddis et. al., 1993; Grossman, 1990; Hasweh, 2005; Magnusson et. al., 1999; Park & Oliver, 2006; Tamir, 1988) accept this knowledge in PCK. Shulman (1986) expects a professional teacher to know curriculum and alternative curriculum materials for a given subject or topic within a grade. Furthermore Shulman claims that teachers should be familiar cross-curricular materials. According to Shulman (1986) "The curriculum and its associated materials are the materia medica of pedagogy, the pharmacopeia from which the teacher draws those tools of teaching that present or exemplify particular content and remediate or evaluate the adequacy of student accomplishments (p. 10)."

After Shulman various researchers (Ball et. al., 2008; Grossman, 1990; Magnusson et. al., 1999; Park & Oliver, 2006) accepted curriculum knowledge as a component of PCK and provided similar definitions of curriculum knowledge. For example, Magnusson et. al (1999) conceptualized curriculum knowledge under two categories; knowledge of aims and targets and special curriculum knowledge. First category includes aims of targets of teaching a lesson and vertical curriculum knowledge that includes the topics that are prior and after the current topic. Second category contains knowledge

about a particular teaching domain and programs and materials related to teaching topics in that teaching domain.

Ball et. al. (2008) hypothesized that curriculum knowledge includes knowing how mathematical concepts and topics arranged in the curriculum, the relations among them, crosscurricular and intra-curricular links. In the light of above studies and according to experts’ opinions we operationalized curriculum knowledge as below:

- To know the arrangement of attainment targets of function knowledge in Secondary School curriculum.
- To be aware of explanations that are given with the attainment targets of functions in the curriculum and to be able to interpret these explanations.
- To know the skills that mathematics curriculum aims to give students learning functions.

As a result, we constructed the following statements table of *the Knowledge of Teaching Functions Test* we developed in the light of the discussions presented above.

Table 1: Statements Table of KTFT

| | | PEDAGOGICAL CONTENT KNOWLEDGE | | |
|-----------|--|---|---|----------------------|
| | | Knowledge about students understandings | Knowledge of instructional strategies and representations | Curriculum Knowledge |
| FUNCTIONS | Functions and representations | | | |
| | Composition of two functions and inverse of a function | | | |

1.1. Writing Test Items

After determining the scope of the Knowledge Teaching Function Test (KTFT) and constructing its statements table we began to write the items. The preparation stage of item writing began with literature review of several bodies of work; learning and teaching functions, theories of teacher

knowledge and particularly pedagogical content knowledge. After being competent in this domain, we studied technical knowledge on writing test items. In this respect, we extensively researched and studied topics such as multiple choice test item and its structure, types of multiple choice test items, principles on writing multiple choice test items, development of multiple choice test items, and item analysis. In the next step of preparation stage we investigated the difficulties and experiences of project teams (LMT, SII, DTAMS, COACTIV and TEDS-M) who developed various PCK tests. Finally we interviewed three mathematics teachers whose teaching experiences range 5 to 15 years. These interviews were about students' and teachers' difficulties about functions. Notes taken from interviews were also used in writing test items.

After preparation phase we started to write test items. One of the authors wrote the item the other author who was more experienced checked and criticized each item according to the following criteria:

- Scientific correctness of the item
- Clarity and answerability
- Appropriateness of the item's root
- Clarity and appropriateness of distracters
- Appropriateness of each item to its cell in the statements table
- Appropriateness of figures and graphics
- Undisputable correctness of true choice and undisputable falseness of distracters

In order to see detailed information about the birth of an item of the Knowledge of Teaching Functions Test please see the unpublished dissertation of the author (Şimşek, 2016). After writing and re-writing according to feedbacks, we developed 25 items. The tests composed of these items were ready to be sent to external check. We asked help for checking and giving feedback from two mathematics educators, a mathematics teacher, a measurement and assessment expert, and a language expert. Before sending 25 items to the experts, we developed special feedback forms that include criteria on controlling the items. Experts checked the items and wrote feedbacks for each item. We made required changes to the items according to these feedbacks. After these changes our test was ready to be piloted. We conducted three pilot studies. A summary of these pilots presented in the table below.

Table 2: Sample of pilot studies, aim, data gathering instruments and analyze methods

| Pilot Studies | Participants | Aim | Data gathering techniques | Analysis |
|---------------|--|--|---|---|
| Pilot I | 23 university students who passed their fundamental mathematics courses and who had not taken any courses related to mathematics teaching and who had not had any experience on teaching mathematics | To control whether or not the items can be answered just by mathematical knowledge | I. pilot form consisting 25 items Semi-structured interviews | Descriptive analysis |
| Pilot II | 26 prospective mathematics teachers | To see appropriateness of test items to target population | I. pilot form consisting 22 items Focus group interviews | Descriptive analysis |
| Pilot III | 240 prospective mathematics teachers | To calculate item and tests statistics | I. pilot form consisting 22 items | Rasch analysis Item analysis according to classical test theory. |

In the first pilot study 23 university students who took the test were from mathematics department and electrical and electronics engineering department. They took the test in the classroom environment. Before the test, the aim of the test was clearly explained to the students in order to help them feel comfortable. Although it was a multiple choice test they were asked to write the reasons for their choices. They were instructed that if they did not know the answer they should leave the question unanswered and explain the reasons why they could not give a response. There was no time limit to the test.

After this, we interviewed with two of these participants. The reason for these interviews was to discuss the answers and underlying reasons with the test taker so that we could see appropriateness of the items to their intended aims. The interviews took place in first author's office and lasted about 50-60 minutes. Each item was checked and discussed with the participants. We wanted to see whether or not the items could be answered just by mathematical knowledge. II. Pilot study started by distributing the test which had some amendments according to the analysis of the I. Pilot study. After I. pilot study we eliminated some items and made changes on some of them. We also made changes on the instructions of the test form. 10 male and 16 female prospective mathematics teachers took the test. They were fifth-year (final year) students. In the second stage of the Pilot II study we conducted focused group interviews. There were two groups, each group had 8 students. These interviews lasted about 75 minutes.

After the required changes made according to the Pilot II study's analysis, new test form was taken by 240 students in the Pilot III study. This sample was selected in a way that it could represent the sample of the main study. The demographical data of these prospective teachers is presented in the following table.

Table 3: Demographical Data of the Pilot Study Sample

| University* | f | Program | | Sex | |
|--------------|-----|---------|-------|------|--------|
| | | PFTC** | ME*** | Male | Female |
| A university | 106 | 55 | 53 | 41 | 65 |
| B university | 89 | 87 | --- | 37 | 52 |
| C university | 45 | --- | 45 | 21 | 24 |
| Total | 240 | 142 | 98 | 99 | 141 |

*University names were coded as above for ethical reasons.

** Pedagogical Formation Training Certificate program

*** Mathematics education program

After statistical analysis of the data gathered from III. Pilot study some adjustments and changes were made and the final version was ready. In the final version of the KTFT test, in order to increase participants' motivation the places of items 16 and 3 were changed, similarly places of item 20 and 21 were changed. This test was distributed to 647 students from 9 different universities. The demographic variables about the participants of the main study can be seen from the table below.

Table 4: Demographical Data of the Main Study Sample

| University* | f | Program | | Sex | |
|--------------|-----|---------|-------|------|--------|
| | | PFTC** | ME*** | Male | Female |
| D university | 152 | 110 | 42 | 44 | 108 |
| E university | 44 | 44 | - | 17 | 27 |
| F university | 73 | 39 | 34 | 20 | 53 |
| G university | 195 | 155 | 40 | 48 | 147 |
| H university | 28 | - | 28 | 11 | 17 |
| K university | 39 | - | 39 | 10 | 29 |
| L university | 64 | 64 | - | 12 | 52 |
| M university | 33 | - | 33 | 11 | 22 |
| N university | 19 | 19 | - | 9 | 10 |
| Total | 647 | 431 | 216 | 182 | 465 |

*University names were coded as above for ethical reasons.

** Pedagogical Formation Training Certificate program

*** Mathematics education program

There were 14 state universities who had mathematics education departments during our study. We selected 9 of them to visit and apply the KTFT test. We selected them purposefully considering our accessibility situation. We applied the test to all final year students of these universities. The participant students took the Knowledge of Teaching Functions Test in the 2nd (last) semester of 2014-2015 academic year during April and May. Author b himself were responsible to apply tests in a serious environment in classrooms. He explained clearly the aim of the test in order to help participants to complete the test under no pressure. There was no time limit and the test lasted approximately 30 minutes.

2. Analysis and Results

We used both item response theory (IRT) and classical test theory (CTT) to analyze the data. Therefore firstly we will present analyses according to IRT.

After careful analysis of the data gathered from the last application of KTFT test we developed the final version of the test by discarding the following items: 1, 2, 4, 5, 6, 7, 8, 13 and 18. The remaining 13 items are selected to be in the final version. A sample of these items is presented in appendix section. The distribution of these items is shown in the following statements table:

Table 5: Statements Table and Items

| | | PEDAGOGICAL CONTENT KNOWLEDGE | | |
|-----------|--|---|---|----------------------|
| | | Knowledge about students understandings | Knowledge of instructional strategies and representations | Curriculum Knowledge |
| FUNCTIONS | Functions and representations | 1, 8 | 5,10 | 2, 4, 13 |
| | Composition of two functions and inverse of a function | 7 | 3, 6, 9, 11, 12 | 2, 4 |

2.1. Item and Test Analysis of KTFT’s final version

We will present statistical analysis of KTFT according to both IRT and CTT. We begin with presenting CTT statistics. However firstly we check its assumptions: unidimensionality and local independence. We used MPlus software to conduct confirmatory factor analysis. In this way we saw how good KTFT fit to single-factorial model. The fit indexes given by Mplus software are: χ^2/df , RMSEA (root mean square error of approximation), CFI (comparative fit index) and TLI (Tucker-Lewis index).

Table 6: Goodness of fit values of KTFT to single factorial model and perfect & acceptable goodness of fit values

| Fit Indexes | Perfect Fit Range | Acceptable Fit Range | Obtained Fit Indexes | Result/Fit |
|-------------|-----------------------------|--------------------------|----------------------|------------|
| χ^2/df | $0 \leq \chi^2/df \leq 2$ | $2 < \chi^2/df \leq 5$ | 1,07 | Perfect |
| CFI | $0,95 \leq CFI \leq 1,00$ | $0,90 \leq CFI < 0,95$ | 0,99 | Perfect |
| TLI | $0,95 \leq TLI \leq 1,00$ | $0,90 \leq TLI < 0,95$ | 0,98 | Perfect |
| RMSEA | $0,00 \leq RMSEA \leq 0,05$ | $0,05 < RMSEA \leq 0,08$ | 0,01 | Perfect |

This table indicates that KTFT fit to single factorial model. Since unidimensionality is closely related to local independence and unidimensionality guarantees local independence KTFT meets local independence assumption. In order to investigate model-data fit we produced the Table 7.

Table 7: KTFT's -2loglikelihood and RMSEA values according to IRT Models

| | Rasch | 2PLM | 3PLM |
|-----------------|----------|----------|----------|
| -2loglikelihood | 10643,29 | 10565,47 | 10560,52 |
| RMSEA | 0,04 | 0,01 | 0,01 |

The Table 7 indicates our data fits to all three IRT theory. Therefore in order to choose the best fit model we investigated ($S-X^2$), see Table 8.

Table 8:KTFT's Item-Model Fit $S-X^2$

| Item | Rasch | | | 2PLM | | | 3PLM | | |
|------------------------|---------|----|--------|---------|----|--------|---------|----|--------|
| | Ki-Kare | sd | p | Ki-Kare | sd | p | Ki-Kare | sd | p |
| 1 | 28,31 | 11 | 0,0029 | 15,14 | 10 | 0,1266 | 13,94 | 9 | 0,1242 |
| 2 | 8,76 | 10 | 0,5560 | 4,98 | 9 | 0,8362 | 2,44 | 8 | 0,9647 |
| 3 | 4,56 | 10 | 0,9188 | 5,07 | 9 | 0,8282 | 7,01 | 8 | 0,5368 |
| 4 | 15,41 | 10 | 0,1174 | 11,23 | 10 | 0,3414 | 11,23 | 9 | 0,2595 |
| 5 | 14,62 | 11 | 0,1999 | 10,64 | 10 | 0,3880 | 5,61 | 8 | 0,6914 |
| 6 | 13,62 | 10 | 0,1908 | 12,40 | 10 | 0,2586 | 13,92 | 9 | 0,1249 |
| 7 | 23,78 | 10 | 0,0082 | 6,23 | 10 | 0,7961 | 4,69 | 8 | 0,7907 |
| 8 | 22,91 | 10 | 0,0111 | 13,95 | 9 | 0,1237 | 16,81 | 9 | 0,0516 |
| 9 | 9,25 | 10 | 0,5102 | 6,26 | 9 | 0,7143 | 5,74 | 9 | 0,7662 |
| 10 | 16,31 | 10 | 0,0910 | 13,19 | 10 | 0,2129 | 10,97 | 9 | 0,2794 |
| 11 | 14,33 | 10 | 0,1578 | 4,79 | 8 | 0,7803 | 6,91 | 8 | 0,5480 |
| 12 | 17,98 | 10 | 0,0551 | 8,45 | 9 | 0,4911 | 7,11 | 9 | 0,6263 |
| 13 | 19,43 | 10 | 0,0350 | 6,19 | 9 | 0,7214 | 7,08 | 8 | 0,5297 |
| | Rasch | | | 2PLM | | | 3PLM | | |
| Number of misfit items | 4 | | | 0 | | | 0 | | |

This table indicates 4 items misfit to Rasch Model. On the other hand all items fit to both 2PL and 3PL models. To choose which better fit model is we employed -2loglikelihood ratio (G^2) test.

Table 9: KTFT's -2loglikelihood Values, Number of Parameters and G2 change between models with respect to 2PL Model and 3PL Model

| | 2PL Model | 3PL Model |
|----------------------|-----------|-----------|
| -2loglikelihood | 10565,47 | 10560,52 |
| Number of Parameters | 26 | 39 |
| ΔG^2^* | 4,95 | |
| Sd** | 13 | |
| p*** | 0,976 | |

* $\Delta G^2 = -2\log\text{likeli}\square\text{ood}_{2PL} - (-2\log\text{likeli}\square\text{ood}_{3PL}) = G^2_{2PL} - G^2_{3PL}$

** Sd: degree of freedom, difference between number of parameters of models.

*** $X^2(13) = 4,95, p = 0,976$

According to -2loglikelihood ratio (G2) test there is not statistically significant difference ($p > 0,05$) between 2 PL model and 3 PL model, therefore any one of these models can be used for our data set. However since number of items and sample size are closely related to information about items provided by the models, we could claim that 2PL model is the most suitable for the current data set (13 items, N=647).

2.2. Analysis of Item Parameters

We used IRTPRO to find discriminative power indexes and difficulty indexes of 13 items. The findings can be seen in the Table 10.

Table 10: Discriminative Power and Difficulty Indexes of 13 Items in KTFT

| Items | Discriminative Power Index (a) | Difficulty Index (b) |
|-------|--------------------------------|----------------------|
| 1 | 0,64 | 0,93 |
| 2 | 0,68 | 2,10 |
| 3 | 1,09 | 0,66 |
| 4 | 0,60 | 1,10 |
| 5 | 0,75 | 0,48 |
| 6 | 0,73 | 0,87 |
| 7 | 0,48 | -0,66 |
| 8 | 0,61 | 1,02 |
| 9 | 0,68 | 1,26 |
| 10 | 0,76 | 0,48 |

| | | |
|----|------|-------|
| 11 | 1,54 | 0,25 |
| 12 | 0,63 | 1,06 |
| 13 | 0,54 | -1,28 |

This table shows that discriminative power indices range between 0.48 and 1.54. Using Baker (2001, p.34)'s labels 13 items can be categorized as follows:

Table 11:Discriminative Power Labels

| Items | Discriminative Power | Labels |
|-------|----------------------|---------|
| 7 | 0,48 | Low |
| 13 | 0,54 | |
| 4 | 0,60 | |
| 8 | 0,61 | |
| 12 | 0,63 | |
| 1 | 0,64 | |
| 2 | 0,68 | Average |
| 9 | 0,68 | |
| 6 | 0,73 | |
| 5 | 0,75 | |
| 10 | 0,76 | |
| 3 | 1,09 | |
| 11 | 1,54 | High |

Table 11 shows that 6 items (7, 13, 4, 8, 12 and 11) have low, another 6 items (2, 9, 6, 5, 10 and 3) have average and only 1 item (11) have high discriminative power. When we look at difficulty indexes in Table ... these indexes range between -1.28 and 2.10. Item 13 is the easiest and item 2 is the most difficult for the participants. Since difficulty indexes fall into a broad interval we can claim that participants are measured according to wide-ranging skills.

IRTPRO gave also item characteristic curves, item information functions, test information curve and test characteristic curve. We begin by presenting item characteristic curves of 13 items in the Figure 3.

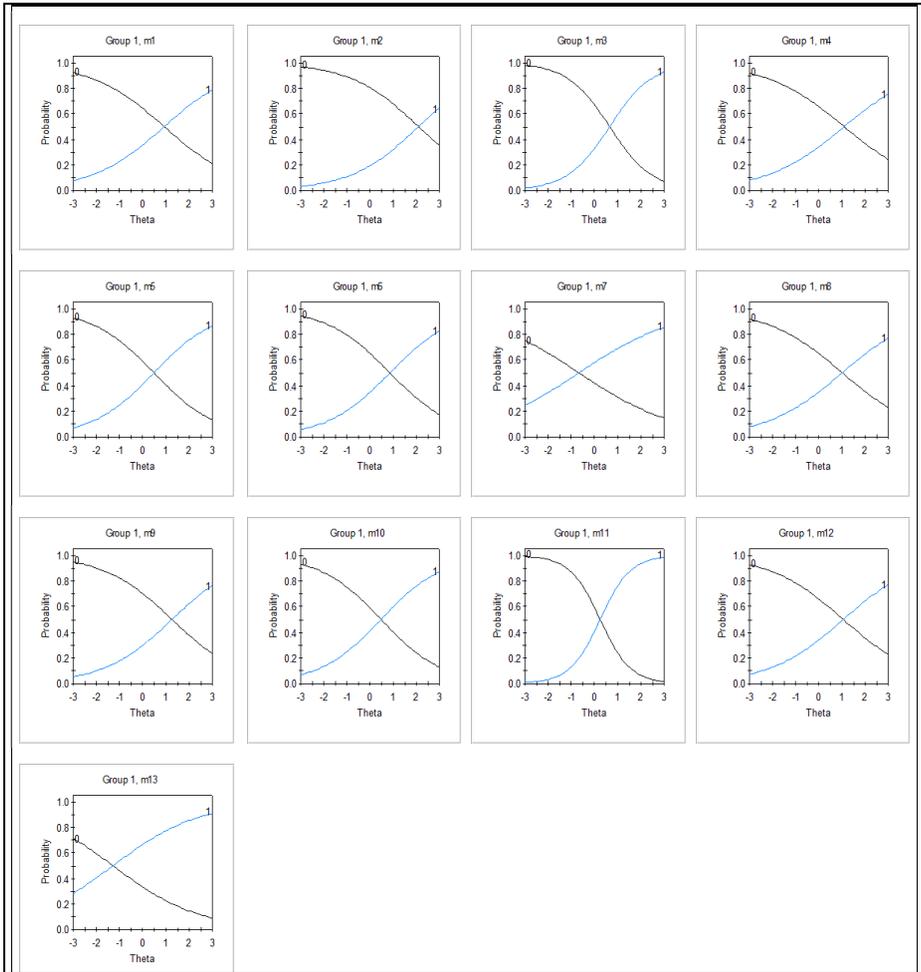


Figure 3: Item characteristic curves of 13 items in KTFT final version

In 2PL model the slopes of item characteristic curves show the discriminative power indexes. The higher the slope is the higher the discriminative power is. The most ideal item characteristic curve is S shaped. Item information functions show the contribution of each items to the test. Following figure shows each item's information functions.

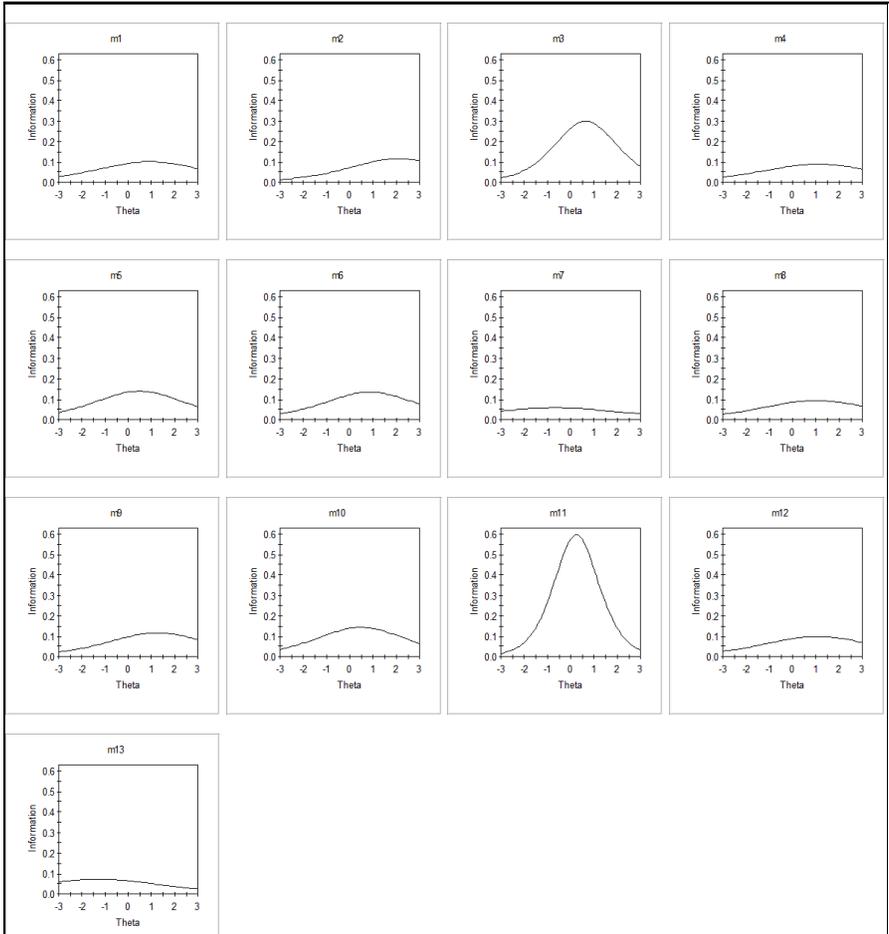


Figure 4: KTFT Items' information functions

Table 12:Theta Values

| It ems | The maximum information value | Theta value at maximum information |
|-----------|----------------------------------|---------------------------------------|
| 1 | 0,101 | 0,70-1,10 |
| 2 | 0,115 | 1,90-2,30 |
| 3 | 0,299 | 0,60-0,70 |
| 4 | 0,89 | 1,10 |
| 5 | 0,139 | 0,40-0,60 |
| 6 | 0,134 | 0,80-1,00 |
| 7 | 0,58 | (-0,90)-(-0,40) |
| 8 | 0,93 | 0,80-1,30 |

| | | |
|----|-------|-----------------|
| 9 | 0,116 | 1,00-1,50 |
| 10 | 0,143 | 0,30-0,60 |
| 11 | 0,595 | 0,20-0,30 |
| 12 | 0,99 | 0,90-1,20 |
| 13 | 0,73 | (-1,60)-(-1,00) |

Figures 3, 4 and Table 12 indicate that item 11 is the one that provides the most information and item 11 provides the least information. Only items 13 and 7 have negative theta values, they show more information about low ability participants. Remaining 11 items have positive theta values therefore they provide more information about high ability participants.

IRTPRO also provides information about KTFT as a whole. The following figure shows KTFT's total information curve.

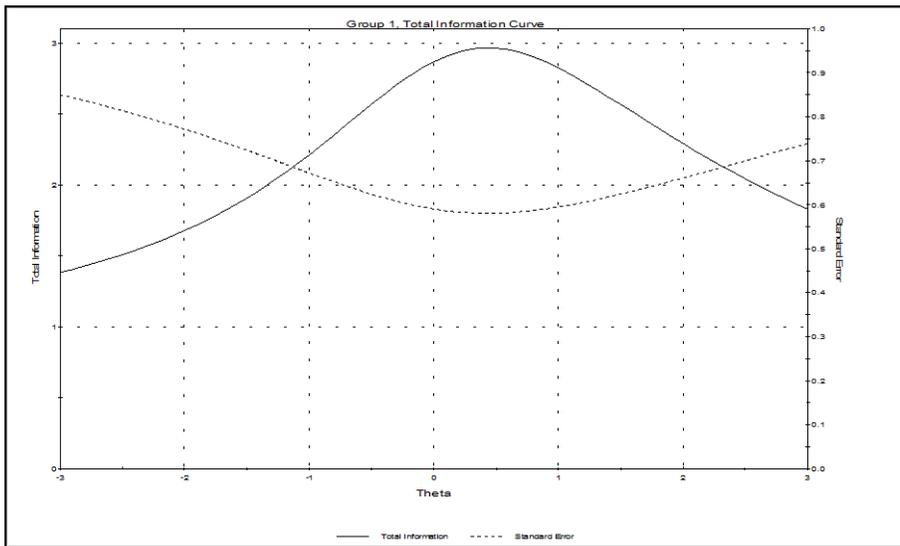


Figure 5: KTFT Information Function

Figure 5 indicates that KTFT provide the highest information with the value of 2.9654 at 0.40 theta level. Standard error at this point is 0.5807. KTFT shows more information about the participants that fall into -0.10 and 1.00 theta levels. Furthermore KTFT has more discriminative power at this theta interval. Besides we can claim that since test information function have

wide distribution KTFT is suitable for measuring knowledge of participants having various theta levels.

2.3. Reliability of KTFT

IRTPRO produced 0.61 as the reliability coefficient for KTFT. Although this is not a high reliability coefficient, it can be considered as acceptable.

2.3.1. Classical Test Theory Analysis of KTFT

In this theory we looked at discriminative power indexes and difficulty indexes of items of KTFT. We used the ITEMAN software to conduct analysis In Table 13 we presented our findings of this analysis.

Table 13: Item statistics of KTFT according to CTT

| Item | Item Statistics | | Item Response frequency (%) | | | | | |
|------|------------------|----------------------------|-----------------------------|-------|-------|-------|-------|-------|
| | Difficulty Index | Discriminative Power index | A | B | C | D | E | Empty |
| 1 | 0,37 | 0,45 | 0,11 | 0,11 | 0,37* | 0,17 | 0,23 | 0,01 |
| 2 | 0,21 | 0,31 | 0,21* | 0,02 | 0,35 | 0,24 | 0,17 | 0,02 |
| 3 | 0,36 | 0,52 | 0,04 | 0,25 | 0,26 | 0,09 | 0,36* | 0,00 |
| 4 | 0,35 | 0,43 | 0,19 | 0,02 | 0,35* | 0,37 | 0,06 | 0,00 |
| 5 | 0,42 | 0,51 | 0,05 | 0,42* | 0,04 | 0,22 | 0,27 | 0,00 |
| 6 | 0,36 | 0,50 | 0,14 | 0,37 | 0,02 | 0,36* | 0,10 | 0,01 |
| 7 | 0,57 | 0,43 | 0,18 | 0,57* | 0,10 | 0,07 | 0,05 | 0,03 |
| 8 | 0,36 | 0,47 | 0,36 | 0,07 | 0,08 | 0,36* | 0,12 | 0,01 |
| 9 | 0,31 | 0,45 | 0,18 | 0,31* | 0,13 | 0,16 | 0,20 | 0,01 |
| 10 | 0,42 | 0,46 | 0,32 | 0,04 | 0,08 | 0,42* | 0,11 | 0,03 |
| 11 | 0,43 | 0,67 | 0,43* | 0,13 | 0,18 | 0,07 | 0,18 | 0,02 |
| 12 | 0,35 | 0,41 | 0,35* | 0,06 | 0,09 | 0,17 | 0,30 | 0,03 |
| 13 | 0,66 | 0,43 | 0,04 | 0,07 | 0,11 | 0,10 | 0,66* | 0,02 |

*Correct choice

Discriminative Power indexes in Table 13 are further categorized as in Table 14 according to Şeker and Genç (2006) criteria.

- 0.00 or negative: No discriminative power,
- 0.10 – 0.19: Little discriminative power,
- 0.20 – 0.39: Average discriminative power,
- 0.40 - 1.00: High discriminative power.

Table 14: Categories of Discriminative power indexes of KTFT Items

| Items | Discriminative power | Category |
|---|----------------------|----------|
| 2 | 0,20 - 0,39 | Average |
| 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 | 0,40 - 1,00 | High |

As can be seen from Table 14 only item 2 is in the average category, all other items are in high category. As a result we can claim that KTFT has high discriminative power. Similarly KTFT is a difficult test because 8 items (1, 2, 3, 4, 6, 8, 9 and 12) have difficulty index below 0.40 (Table...) which are accepted as difficult items. Furthermore, the difficulty indexes are in 0.21-0.66 interval and their average is 0.39. The most difficult item is item 2 and the least difficult item is item 13.

3. Conclusions and Discussions

The aim of this paper is to report about a multiple choice test aimed to measure prospective teachers' pedagogical content knowledge in the context of functions. We named this test "Knowledge of Teaching Functions Test (KTFT)". KTFT was developed and analyzed taking both IRT and CTT into consideration. The reason using both of these theories was to benefit from superior suggestions of each theory.

KTFT was based on two fundamental knowledge base: functions and PCK. When we compare KTFT with previously conducted test development studies we noticed that there were some similarities and differences. In the mathematical topic dimension, the comparison of KTFT study with other test studies reveals that the most of test development studies embraced more than one mathematical topic since they were carried out by large project teams (LMT, COACTIVE, DTAMS, TEDS-M). Numbers, algebra, geometry, measurement, statistics and probability were the topics involved in these projects. Since it is widely claimed in the literature that PCK has topic-specific nature (Cankoy, 2010), KTFT test can be regarded as more valid.

The scope of KTFT was determined by looking at school mathematics (grades 9, 10, 11, 12) curriculum. This is a common practice in PCK test development (Mercimek, 2013; Krauss, Baumert & Blum, 2008).

PCK is the second knowledge base that is investigated in the development of KTFT. In the large research projects we noticed that PCK is

conceptualized and operationalized differently by different research teams. For example Ball and her colleagues at Michigan University developed mathematical knowledge for teaching model. After developing this model they developed tests according to their model. In this model, PCK is conceptualized by means of three components: knowledge of students and subject, knowledge of teaching and subject and curriculum knowledge (Hill, Ball & Schilling, 2008). This approach is taken in other large research projects. In COACTIV, DTAMS and TEDS-M projects research firstly conceptualized a model according their perspectives and then developed test questions according to their models. In relatively smaller scale research studies, researchers took one of these models directly and developed tests (e.g. Esen, 2013; Güler, 2014).

In this study we did not take a model directly, instead we conceptualized and operationalized PCK by examining previous studies in detail and then constructing our framework in the light of our research aims. Thus, we chose the most accepted components in the literature: knowledge about students and knowledge of teaching strategies and representations.

Although the conceptualization of PCK is constructed according to the literature, the nature of PCK cannot be laid down as needed. The complex structure of PCK, the lack of universally accepted conceptualization, the difficulty in dismantling PCK with clear lines and the interaction between PCK components caused a lot of problems during test question development. Especially since there are not clear cut boundaries among PCK components, it was difficult for us to put a question into particular components. Although we conceptualized PCK with three components, we regarded PCK as a whole body of knowledge that was amalgamated from three components. Due to these difficulties we regarded KTFT as a single factorial design, and examined its psychometric properties accordingly. These kinds of difficulties were also experienced by other PCK test developers, such as Esen (2013), Hill et. al. (2008). Furthermore in studies such as COACTIV, DTAMS, TEDS-M; although at item writing stage PCK components were taken into account, the structure of the tests constructed as having single factor.

One of the distinguishing features of the KTFT in our study is that it measures just PCK. Other PCK tests in the literature are developed to measure not only PCK but also SMK. Another distinguishing feature is that we prepared test items such that they could not be answered just by mathematical knowledge. This adds additional support to its validity.

As we pointed earlier KTFT test contained difficult items. Such kind of difficulty might affected the KTFT's reliability. One of the reasons for KTFT is being difficult might be that the participants faced such questions in KTFT for the first time. As a matter of fact there are claims in the literature asserting that PCK can only be gained on the job (see Fennema, E., & Franke, M. L. (1992)). Therefore, prospective teachers might have little or no PCK. Although there are counter ideas to this claim, our study may contribute to this discussion.

Another reason for KTFT having just satisfactory level reliability coefficient (0.61, not high) might be its total number of items being small (22 items). It is a well-known fact that number of items has important effects on the reliability and standard error of tests.

4. Recommendations

We advise PCK test developers to carefully read studies in the literature that conceptualizes PCK. Then they would see that there is a lot of ambiguity on PCK theory. Hence they should develop their tests with this in mind. This would help them a lot in being clear about the limitations of their studies.

Previously developed tests and their reports would be another helper for test developers. These kind of studies will inform them about advantages and dis-advantages of different data gathering methods. This is very important for measuring or assessing such a complex structured PCK.

From the experiences we had from this study we could advise researchers to develop PCK tests for a specific topic. This would add support the validity of their tests. We also recommend researcher to think over finding extra strategies to get high reliability coefficients for their tests. If the number of reliable and valid PCK tests increases in the literature these can be used by teacher educators in their courses such as teaching methods to assess prospective teachers.

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Appendix

Sample Items

Item 2:

I. $f: \mathbb{R} \rightarrow \mathbb{R}, f(x) = ax + 3b - 4x$ and f is a unit function $4a - 3b = ?$

II. $f: \mathbb{R} \rightarrow \mathbb{R}, (x) = 5x + 9$ find inverse function of f .

III. $f: \mathbb{R} \rightarrow \mathbb{R}, (x) = x^2$ and $g: \mathbb{R} \rightarrow \mathbb{R}, (x) = x + 1$ if then $g \circ f(x) = ?$

According to the current mathematics curriculum which one(s) of the above problems is/are suitable to grade 9 level?

- A) Only I B) Only III C) II-III D) I-II E) I-III

Item 3

Teacher Kevin asked his students to find the inverse of $f: \mathbb{R} \rightarrow \mathbb{R}, (x) = 2x - 6$. One of his students wrote the following solution.

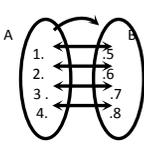
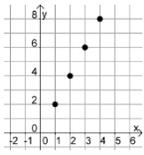
$$f^{-1}(x) = (2x - 6)^{-1}$$

$$f^{-1}(x) = \frac{1}{2x - 6}$$

In order to cause a cognitive conflict on this student, which one of the below questions is the most appropriate to be asked by Teacher Kevin?

- A) Can you check your operations?
 B) Would you find the inverse of $g: \mathbb{R} - \{0\} \rightarrow \mathbb{R}, g(x) = \frac{1}{x}$
 C) Would you check one-to-oneness and ontoeness of the function?
 D) Are you sure about your solution?
 E) Can you show that $(f \circ f^{-1})(3) = 3$

Item 13

| | |
|--|--|
|  | $f: \{1, 2, 3, 4\} \rightarrow \{2, 4, 6, 8\}$  |
| $f: \{1, 2, 3, 4\} \rightarrow \{2, 4, 6, 8\}$ $f(x) = 2x$ | |
| $f: \{1, 2, 3, 4\} \rightarrow \{2, 4, 6, 8\}$ $f = \{(1, 2), (2, 4), (3, 6), (4, 8)\}$ | |

Teacher Faith helps his students to construct function concept by attracting their attentions with function examples similar to the above ones.

What are the skills his students most probably to develop owing to teacher Faith's above teaching approach?

- A) Proving - Problem solving
 B) Problem solving - Hypothesizing
 C) Proving - Making connections
 D) Mathematical communication - Hypothesizing
 E) Mathematical communication - Making connections

CHAPTER 4

THE RELATIONSHIP BETWEEN SOCIAL MEDIA ADDICTION AND LONELINESS AND SOCIAL APPEARANCE ANXIETY IN YOUNG PEOPLE

Assist. Prof. Dr. Berrin GÜNER¹

¹ Aydın Adnan Menderes University, Faculty of Humanities and Social Sciences
- Department of Sociology. berringuner@gmail.com.

INTRODUCTION

Today, in parallel with technological developments, it is seen that tools that make people's lives easier have emerged. Internet is one of the technological developments that enable communication between people to become faster. In parallel with the development of internet technology, people have the opportunity to communicate with other people more easily, as well as to share their ideas and opinions. Social media is one of the most used tools in communication processes over the internet (Demir, 2016: 28). Social media applications have emerged since the 1990s, when internet tools developed rapidly, and they have entered the lives of everyone who can access technological tools today (Şardağ-Karabulut, 2015: 1). Today, in many studies on different cultures, it is stated that the prevalence of social media use is at a high level (Kesici, 2019: 315; Golder et al., 2015: 878; Kowal et al., 2020: 1). YouTube, instagram, facebook, twitter and linkedin are the most used social media applications. These social media applications are used not only by individual users, but also by corporate structures and companies for public relations activities or sales-marketing purposes (İnce, 2017: 77).

When the information in the literature is evaluated, it is seen that the use of social media is becoming increasingly widespread, and on the basis of this, it is seen that social media facilitates human life in many ways. On the other hand, excessive and unconscious use of social media causes social media addiction over time, and social media addiction brings many psychosocial problems. Loneliness is at the forefront of these problems, and research findings support the view that there is a significant relationship between social media addiction and loneliness (Jafari et al., 2019: 1; Ezoë and Toda, 2013: 407; Kim et al., 2017: 637). In addition, it is seen that young people addicted to social media generally have social appearance anxiety and are therefore addicted to social media for the purpose of socialization. The results of the research show that there is a significant relationship between social appearance anxiety and social media addiction (Kocaman and Kazan, 2021:2638). At the end of the literature review, it was seen that the studies on the relationship between social media addiction and loneliness and social appearance anxiety in young people are limited in our country. In this context, this study aimed to examine the relationship between social media addiction and loneliness and social appearance anxiety in young people.

SOCIAL MEDIA AND ITS FEATURES

Social media applications are among the applications that emerged in the 1970s, developed rapidly in the 1990s, and started to be widely used by many people with the development of web 2.0 technology since the 2000s (Akıncı-Vural and Bat, 2010: 3349). Blogs are one of the most widely used social media tools today. Blogs are basically web pages where people share their personal observations, experiences and opinions (Özudogru, 2014: 36). Another widely used social media application is microblogs. In these applications, it is seen that people use a limited number of words while explaining their feelings, thoughts and opinions. For example; Twitter, which is a microblog, limits each blog post to 140 characters (Menteşe, 2013: 8). Another social media tool that people commonly use is "Wiki". The word wiki emerged with the abbreviation of the words "What I Know is" in English, and its Turkish equivalent means "as far as I know" (Menteşe, 2013: 8). While wiki pages are generally enriched with content shared by users by citing sources, it is seen that the most used wiki application today is "Wikipedia" (Kahraman, 2014: 21-22). Another social media tool that users have widely preferred in recent years is video-media sharing pages. It is seen that users share their own videos on video sharing pages. While the shared videos are sometimes published publicly, sometimes users can limit the audience to watch the videos. Video sharing applications allow users to create videos as well as uploading ready-made videos to the system. In addition, users can also view videos uploaded by different people or film-video companies (Menteşe, 2013: 11). Social networking sites are at the forefront of other social media applications that people commonly use. The main purpose of these sites is to enable people to communicate and socialize. It is seen that the most preferred social networking site today is Facebook (Kahraman, 2014: 22; Borrelli et al., 2021: 882; Khumsri et al., 2015: 51; Halima and Amer, 2015: 239).

When its structural features are examined, it is seen that social media applications have different features from traditional communication tools. While the shares made and the content presented in traditional communication tools are under the control of certain people, everyone can easily share their own content on social media (Baloğlu, 2015: 1). For this reason, when compared to traditional media tools, it is seen that social media applications

have more content and unique users (Ying, 2012: 20). Another feature of social media is that it offers faster communication opportunities compared to traditional media tools. In studies on this subject, it is stated that people see social media faster than traditional media tools (Utma, 2019: 118).

When the information in the literature is evaluated, it is possible to say that social media tools are basically applications that accelerate communication and interaction between people. However, it is seen that social media is used for many different purposes today because of its features and providing easy access to people. When the studies are evaluated, in addition to providing communication between people, social media's public relations activities (Allagui and Breslow, 2015: 1; Taylor and Kent, 2010: 207; Graham et al., 2013: 1), consumers' purchasing processes (Oyman and Akıncı, 2019). : 441; Atıgan, 2020: 1892; Söyleyici and Çetinkaya-Bozkurt, 2017: 36), in the processes of providing brand image and corporate reputation of enterprises (Bilgin, 2018: 128; Dijkmans et al., 2015: 58; Becker and Lee, 2019: 231).), in addition to this, it is seen that it is used for purposes such as evaluating leisure time (Kocaman-Karoğlu and Atasoy, 2018: 826).

SOCIAL MEDIA ADDICTION IN YOUNG PEOPLE

Today, it is seen that the use of social media among young people and adults has turned into a daily routine (İşlek, 2012: 1). At the beginning of the factors underlying this is the practicality of social media in the process of communication and accessing information and providing convenience to people. Thanks to social media, people save time as they can easily access information. However, excessive use of social media by people also brings social media addiction (Çiftçi, 2018: 418). In the studies in the literature, it is stated that the use of social media is becoming increasingly widespread, especially among young people, and research findings on young people show that social media addiction has started to increase in young people (Al-Menayes, 2015: 23; David and Warriar, 2021: 160; Hassan et al., 2020:1). In a study conducted on this subject, it was aimed to examine the frequency of social media use and the factors affecting the level of social media addiction in individuals living in different countries. The aforementioned study was conducted on individuals using social media in 32 different countries. At the end of the study, it was found that people's social media addiction levels

showed some differences between countries, and it was reported that the level of social media addiction varied between 13% and 31%. In the study conducted by Doğan (2019: 13), it was aimed to examine the factors related to the level of social media addiction in young people, and it was found that 12.6% of the participants in the study had symptoms of social media addiction. In a different study conducted by Erdoğan (2019: 32), it was aimed to examine the factors affecting social media addiction in young people, and the study was carried out on university students studying in different departments. At the end of the study, it was reported that social media addiction among young people is above the medium level, and in this context, university youth are in the risk group for social media addiction.

The prevalence of social media addiction among young people brings along various health problems. When the studies on this subject are examined, it is seen that social media addiction causes stress, depression and anxiety disorders in young people (Wilson et al., 2010: 173; Brailovskaia and Margraf, 2020: 818; Haand and Shuwang, 2020: 780). In addition, social media addiction negatively affects academic performance (Prabandari & Yuliati, 2016: 1; Khan et al., 2019: 74), and isolates young people by isolating them from social life (Baltacı, 2019: 73; Rachubinska et al., 2021: 1982; Yaşar- Can, 2020: 6) is stated to cause physical health problems such as movement disorders and obesity (Saud et al., 2019: 16; Jolliff et al., 2020: 454).

As can be seen, social media addiction among young people is becoming more and more common in Turkey as in other countries. Social media addiction negatively affects the psychological and physical health, social life and academic performance of young people. For this reason, it is an important issue for young people to identify the factors that cause social media addiction in young people and to develop solutions to reduce social media addiction. It is possible to say that the main causes of social media addiction in young people are personality traits. In a study conducted by Sağır (2021: 26), it was aimed to examine the relationship between social media addiction and personality traits in young people. In the aforementioned study, it was reported that there is a positive and significant relationship between social media addiction and narcissistic personality structure. In addition, it is seen that the opportunities offered by social media increase social media

addiction among young people. The intense use of social media by young people, especially for purposes such as entertainment, leisure or socialization, increases the risk of social media addiction. Research findings (Tutgun-Ünal, 2015: 107) also support this view.

THE CONCEPT OF LONELINESS

One of the most encountered social problems in the social structure in recent years is loneliness. The fact that the individual living in the society is becoming increasingly lonely today has paved the way for the acceleration of the studies in this field. The increasing loneliness of people, especially in western societies, has increased researchers' interest in loneliness (Yabancı, 2019: 20; Kahraman, 2018: 1). When evaluated conceptually, loneliness; It is defined as the fact that the individual does not go out of the cocoon he has created as a result of losing his connection with the outside world. In the process of emergence of loneliness, it is seen that the individual acts consciously and concentrates on his feelings (Armağan, 2014: 28). This process can be completed in a short time, or it can take a long time. In this context, it is possible for people to feel lonely in a short or long time (Balcı, 2018: 24). Although the emergence of loneliness differs among people, it is seen that lonely people generally have a high tendency to depression, hypersensitive to rejection, low quality of life, anxious and introverted (Akyüz, 2018: 34; Mellor et al., 2008: 213). It is stated that suicidal tendencies can also be seen in individuals with high levels of loneliness (Eskin, 2001: 5). In addition, factors such as socio-demographic structure, low self-esteem, shy personality structure and social anxiety are the leading factors that cause loneliness (Erözkan, 2009: 810). People generally experience high levels of emotional loneliness in their social life cycle. Emotional loneliness; It is a term used for people who are deprived of their private relations. The loneliness experienced by some people is expressed as hidden loneliness. Basically, in hidden loneliness, the individual does not reflect her/his inner sadness and loneliness to the outside. Another type of loneliness seen in society is deep loneliness. In deep loneliness, the individual experiences a high level of loneliness and does not see himself as a member of the society (Yaşar, 2007: 238).

SOCIAL APPEARANCE ANXIETY

When considered conceptually, social appearance anxiety; It is defined as a constant and distinct fear that occurs when people encounter people they do not know before or when they think that other people are above their attention (Sertelin-Mercan, 2007: 9). In other words, social appearance anxiety; It can be defined as people having a negative body perception in relation to their physical structure or appearance (Doğan, 2010: 152). There are many factors that cause social appearance anxiety in people. As with many behavioral disorders, hereditary factors are at the forefront of the underlying causes of social appearance anxiety. Research findings also reveal that the brain structures of individuals with social appearance anxiety are different from those with healthy development (Özdikmenli-Demir, 2009: 106). Incompatible schemas that emerge at an early age also cause social appearance anxiety. In particular, suppression, over-alertness, rejection, impaired autonomy and separation anxiety cause social appearance anxiety over time. In addition, factors such as excessive criticism at an early age, tendency to suppress emotions, punishment, emotional deprivation and abuse cause social appearance anxiety (Kömürçü and Gör, 2008: 186).

There are some behavioral patterns exhibited by individuals with social appearance anxiety, which occurs due to different factors. At the beginning of these behaviors are loss of control, somatic reactions to negative social evaluation, excessive preoccupation and fear of being disgraced when put in a bad situation (Göktürk, 2011:14). In addition, individuals with social appearance anxiety have low self-confidence and self-esteem because they attribute negative meanings to their bodies. For this reason, individuals with high social appearance anxiety constantly see themselves as worthless, feel shy, and experience insecurity and restlessness (Çiftçi, 2012: 23; Kara, 2016: 95). These factors negatively affect both family life satisfaction and general life satisfaction in individuals with social appearance anxiety (Kaplan et al., 2021: 1029).

THE RELATIONSHIP BETWEEN SOCIAL MEDIA ADDICTION AND LONELINESS IN YOUNG PEOPLE

Young people become lonely because social media addiction brings social isolation. The results of the research conducted on young people in

different age groups and with different cultural characteristics in the literature also show that there is a positive and significant relationship between social media addiction and loneliness (Arıbaşı and Özşahin, 2022: 137; Ayhan et al., 2021: 750; Stankovska, 2016: 255; Zeybek, 2021: 1). In a study conducted by Gökçearsan et al. (2021: 1) and in which university students participated, it was aimed to examine the relationship of smartphone and social media addiction with personality traits, relationships with family and loneliness, and 500 students from different departments participated in the study. At the end of the study, it was determined that there was a positive and significant relationship between social media addiction and students' loneliness levels. In the research conducted by Topçu (2020: 1), the relationship between social media addiction and loneliness in students aged 14-16 was examined, and the study was carried out with the participation of 547 students. At the end of the related study, it was found that the relationship between social media addiction and loneliness was positive and significant, and in this context, it was determined that the students felt more lonely as their social media addiction levels increased. In the study carried out by Rıhtım (2019: 4), the relationship between social media addiction and the perception of loneliness in the virtual environment in university youth was examined, and the aforementioned research was conducted on 412 university students. At the end of the related study, it was determined that there was a positive and significant relationship between the social media addiction levels of the students and the level of feeling lonely in the virtual environment. In another study conducted by Uğur (2018: 56) on university students, the relationship between students' social media usage habits and loneliness was examined, and at the end of the research, it was found that there was a positive significant relationship between students' intense use of social media tools and their loneliness levels.

In a study dealing with the relationship between internet and social media addiction and loneliness in young people, the relationship between internet addiction and loneliness was evaluated, and 106 men and 105 women aged between 18-27 participated in the study. At the end of the study, it was found that as the time spent on the Internet increases, the risk of being internet addicted to young people also increases. In the aforementioned study, it was determined that internet addiction increased the risk of loneliness and

loneliness symptoms were found to be high in young people with high internet addiction (Durak-Batigün and Patient, 2010: 213). In the study carried out by Kanat (2019: 80), it was aimed to examine the relationship between loneliness and digital games played on social media platforms in university youth, and İnönü University students participated in the study. At the end of the study, it was found that digital game addictions of young people differ according to socio-demographic variables, and it was reported that there is a significant and positive relationship between digital game addiction and loneliness. In the study conducted by Gezgin et al. (2018: 358), the relationship between nomophobia (fear of losing communication with mobile phone) and loneliness was examined. In the aforementioned study, it was determined that the level of loneliness is also high in young people who are afraid of being cut off from communicating with their mobile phones.

In a study in which university students participated, it was aimed to examine the relationship between social media addiction level and psychosocial development characteristics. In the study, the dependent variables were determined as social media addiction, depression and loneliness. At the end of the study, it was found that social media addiction in young people has a positive and significant relationship with both depression and loneliness. In the same study, it was reported that social media addiction has a positive relationship with loneliness sub-dimensions (Akyüz, 2018: 3).

In another study conducted on young adults on this subject, it was aimed to determine the relationship between the time allocated to social media use during the day and the level of loneliness. 378 people in the age group of 18 and over participated in the study. At the end of the study, it was determined that as the time spent by the participants for social media usage increased, their loneliness level increased (Hasanoğlu, 2019: 4). In a study conducted on university students, it was aimed to examine the relationship between students' Facebook addiction levels and loneliness levels. 712 students studying in different departments were included in the related research. At the end of the study, it was concluded that there was a positive relationship between the students' Facebook addiction levels and their loneliness levels.

THE RELATIONSHIP BETWEEN SOCIAL MEDIA ADDICTION AND SOCIAL APPEARANCE ANXIETY IN YOUNG PEOPLE

Young people with social appearance anxiety use social media as a means of socialization because they have communication problems in the social structure and are not satisfied with their social appearance. The high level of social appearance anxiety among young people with social media addiction also supports this view (Sarsu, 2020: 6). In a study conducted on this subject and carried out on university youth, it was aimed to examine the psychological consequences of social media addiction. A total of 370 students studying in different departments were included in the said study, and at the end of the study, it was found that students with both problematic internet use and high social media addiction experienced social appearance anxiety (Ahmed et al., 2021: 1). In a study conducted on university students, the relationship between social media addiction level and social media anxiety was examined. 382 students participated in the study carried out on Harran University students. At the end of the related study, it was seen that there was a positive and significant relationship between social media addiction and social appearance anxiety in students. In this context, it has been reported that social media addiction is high in students with high social appearance anxiety (Aslan, 2020: 6). In another study conducted on young adults, the effect of social media addiction on social appearance anxiety was examined, and it was found that social media addiction in young adults positively and significantly affected social appearance anxiety. In the aforementioned study, it was found that 14.3% of individuals who use social media extensively, feel uncomfortable when talking to other people because of their social appearance (Altındış et al., 2017: 228).

In a study conducted on high school students, it was aimed to examine the relationship between students' attitudes towards social media and social appearance anxiety. 443 students studying at different high schools participated in the research. At the end of the study, it was found that there was a positive and significant relationship between students' attitudes towards social media and their social appearance concerns. In this context, it has been determined that as the attitude towards social media is positive, the loneliness levels of the students increase (Aydın, 2020: 2). In a different study carried

out on university youth, it was aimed to examine the relationship between social media addiction, self-esteem and loneliness in students. 581 students studying in different departments participated in the research in question. At the end of the study, it was determined that as the level of social media addiction increased, self-esteem decreased and social appearance anxiety increased (Ceylan, 2021: 5).

In the study carried out by Çetinkaya (2021: 1), it was aimed to examine the relationship between the level of social media addiction and fear of negative evaluation and social appearance anxiety in university students. According to the findings of the relationship between the dependent variables in the study, it was found that as the fear of negative evaluation increased in students, social appearance anxiety also increased. In addition, it has been determined that there are positive and significant relationships between social media addiction, fear of negative evaluation and social appearance anxiety. In the study conducted by Erdoğan (2019: 3), it was aimed to determine the relationship between social media addiction and communication skills and social appearance anxiety in university students. A total of 260 university students, 111 men and 149 women, studying in different departments, participated in the related study voluntarily. In the said study, it was reported that there was a negative relationship between students' social media addiction levels and their communication skills, while the relationship between social media addiction and social appearance anxiety was positive and significant. In the study carried out by Fidan (2021: 4), it was aimed to examine the relationship between personality traits, social media addiction and social appearance anxiety in high school students. A total of 400 students, 200 male and 200 female, participated in the related study. At the end of the study, it was found that the personality traits of the students were determinative on social media addiction, and it was reported that there was a positive and significant relationship between social media addiction and social appearance anxiety. In the study carried out by Öztürk (2021: 1622), the relationship between the frequency of social media use and social appearance anxiety in high school students was discussed. A total of 356 high school students, 141 male and 215 female, participated in the related study. At the end of the related research, it was found that as the frequency of social media use of the students increased, their social appearance anxiety also increased.

CONCLUSION

In recent years, it is seen that communication and interaction between people has increased in parallel with technological developments. Undoubtedly, the increasing prevalence of social media plays a major role in the development of communication processes. In addition to accelerating communication processes, the use of social media in different areas of gaming, purchasing, advertising and marketing also increases the interest in social media. However, the unconscious, out-of-purpose and excessive use of social media brings along social media addiction. The widespread use of social media among young people in recent years paves the way for young people to be in the risk group for social media addiction.

Since social media addiction affects the psychological and social structure negatively, it is seen that researches on the psychological and social effects of social media addiction in young people have increased in recent years. In this study, the results of the research on the subject were examined and it was seen that social media addiction in young people was associated with loneliness. In addition, according to the research findings, it has been determined that the increase in the time spent in front of social media tools also causes loneliness in young people, even if they are not at the level of addiction. Among the reasons underlying the increasing prevalence of social media addiction among young people are the spread of digital games played through social media tools, and the fact that young people with introverted personalities see social media tools as a means of socialization. In addition to these, it is possible to count the reasons such as that social media tools offer many opportunities to young people from purchasing to entertainment and that social media is seen as an activity of leisure time among young people. Considering that the phenomenon of loneliness in young people brings with it other psychological and social problems, it is important to take measures to reduce social media addiction among young people. Although loneliness in young people arises as a result of social media addiction, it is possible for some young people to turn to social media because they feel lonely. In addition, another factor that increases the frequency of social media use in young people and prepares the ground for social media addiction is social appearance anxiety. It can be thought that the reason for the high social media addiction among young people with high social appearance anxiety is that

young people who are not satisfied with their appearance cannot make enough friends in the society. In addition, young people are able to satisfy their feelings of admiration by making changes on their facial features and body appearance through some opportunities (photo and video formatting) offered to them by social media applications. This paves the way for young people with social appearance anxiety and shy attitudes to use social media for socialization and to become social media addicts over time. However, when it is considered that social media addiction also causes different psycho-social problems, awareness raising studies can be conducted on the use of social media, especially for individuals with social appearance anxiety.

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CHAPTER 5

SOCIO-DEMOGRAPHICS AND SATISFACTION WITH LIFE

Dr. Can MAVRUK¹

¹Niğde Ömer Halisdemir University, Niğde Vocational School of Social Sciences, Niğde, Turkey, can.mavruk@ohu.edu.tr, ORCID: 0000-0002-4084-7447

INTRODUCTION

Life satisfaction is defined as the degree to which an individual positively evaluates the overall quality of life (Veenhoven, 1996). Thus, life satisfaction is an overall assessment of a person's quality of life based on criteria they choose (Shin and Johnson, 1976; Veenhoven, 1996). According to Skevington (2008), life satisfaction is nested within the overall quality of life and is within the overall concept. According to Tatarkiewicz (1976), satisfaction with life is necessary for happiness. All these show that life satisfaction is the basis for happiness and quality of life which are used as subjective well-being in international literature.

In the global assessment of life satisfaction, previous research demonstrates that personality, life events, experiences, mental and physical health indicators, demographic and socio-economic factors are important determinants. This study focuses on only demographic and socio-economic factors (socio-demographics). Previous research has consistently shown that the relationship between socio-demographics such as age, gender, socioeconomic status and life satisfaction was weak and that these variables contributed only modestly to the prediction of life satisfaction (Proctor, Linley and Maltby, 2017). Socio-demographics such as age, gender, income, education and occupation explain only about 10% of the variability in life satisfaction (Veenhoven, 1996).

For the assessment in previous studies, satisfaction with life scale developed by Diener et al. (1985) as an overall judgment of life (Daraei & Mohajery, 2013), Turkish Statistical Institute Life Satisfaction Surveys (Dumludağ, Gokdemir & Giray, 2016; Giray & Bacaksız and Camkıran, 2021; Pehlivan, Özbay & Bingöl, 2022; Caner, 2016); Eren and Aşıcı, 2017; Kuzu, Elmas-Atay and Gerçek, 2019), World Values Survey (Selim, 2008) and self-reported surveys (Gitmez and Morçöl, 1994) are used. In those using the Turkish Statistical Institute Life Satisfaction Surveys, life satisfaction was used as happiness.

In developed countries, age and sex differences in life satisfaction are small (Veenhoven, 1996). Health is by far the strongest variable explaining life satisfaction (Palmor and Luikart, 1972). Income and education have a stronger relationship with life satisfaction among those with below-average income. Income has shown stronger effects in developing countries than in developed countries. In general, being married, having higher education, living with fewer people in the family, having income above the poverty line,

and being a paid employee compared to not have stronger effects on life satisfaction.

The impact of socio-demographics on life satisfaction varies in Turkey. Married people (Selim, 2008; Giray, Bacaksız & Camkıran, 2021), better health (Pehlivan, Özbay & Bingöl, 2022), higher income (Gitmez and Morçöl, 1994) were found to have the highest satisfaction with life. Age was found to have negative effects on satisfaction with life (Selim, 2008; Giray, Bacaksız & Camkıran, 2021; Pehlivan, Özbay & Bingöl, 2022). Gender effects were mixed as significant (Selim, 2008; Eren and Aşıcı; 2017) and insignificant (Kuzu, Elmas-Atay & Gerçek, 2019). Married people were found to have higher satisfaction with life than unmarried people (Dumludag, Gokdemir & Giray, 2016; Eren & Aşıcı, 2017). Income was found to have positive and significant effect on satisfaction with life (Dumludag, Gokdemir & Giray, 2016; Selim, 2008; Pehlivan, Özbay & Bingöl, 2022; Caner, 2016; Eren & Aşıcı, 2017). Urban-rural difference had negative effect on life satisfaction (Dumludag, Gokdemir & Giray, 2016). In relationship of socio-economic status (occupation, education, and income) with life satisfaction of Indian domestic worker women, a positive correlation was found (Daraei and Mohajery, 2013).

This study is carried out to determine the effects of socio-demographics on life satisfaction based on a sample survey conducted in Adana. In the survey, age, gender, marital status, number of people in a family, poverty level, employment status and health status are included as socio-demographics. Interactions of these variables with location of living are used to determine whether location effects are significant. To this end, conditional marginal effects are estimated using ordinal logistic regression models. The study concludes with possible implications for social policies.

1. LITERATURE

In this section, previous studies mentioned in the introduction are detailed.

Dumludag, Gokdemir & Giray (2016) using ordered logit models showed that effects of socio-economic variables were significant on life satisfaction. Relative and absolute level of income were found as important in determining individual well-being. High household income, being a housewife, being retired had positive effects, whereas being divorced, being married living alone in urban areas in Turkey have negative effects.

Selim (2008) used European Values Study Group and World Values Survey Association 2006 for Turkey for the years 1990, 1996 and 2001 to investigate life satisfaction and happiness in Turkey. The author found significant health, income and employment effects on happiness and life satisfaction in Turkey. Using ordered logit model the author also found a negative age effect, positive effects of income and health status, and a negative effect of unemployment. The effect of the number of children on happiness and life satisfaction was negative. Education level effects were mixed on life satisfaction but insignificant on happiness. Males had a negative significant effect on both.

Gitmez and Morçöl (1994) based on a survey of 145 interviews conducted in six strata of residency areas in Ankara investigated socio-economic effects on life satisfaction with various domains. The authors found that socio-economic status (income status) was a strong determinant of satisfaction with life domains based on univariate, bivariate and multiple discriminant analyses.

Giray, Bacaksız & Camkıran (2021) used nonlinear canonical correlation analysis to examine the effects of socio-demographic characteristics on the perception of happiness in Turkey based on the Turkish Statistical Institute 2017 Life Satisfaction Survey. The authors found that marital status had the highest effect on perceived happiness, and married people were happier than the unmarried ones. Age had a negative, educational background had a positive effect. For employment status, per diem employees were unhappy.

Pehlivan, Özbay & Bingöl (2022) used Turkey Statistical Institute Life Satisfaction Survey for the 2004-2019 period to examine the effects of health, education, and household incomes on happiness. The authors used the ordered logit model to evaluate odds-ratio and marginal effects. They found that health has the most significant effect on happiness; income had positive and significant effect on happiness; but education did not show a statistically significant relationship.

Caner (2016) used regression analyses based on the Turkish Life Satisfaction Survey and the World Values Survey for Turkey for the years 2007 and 2011 to investigate the determinants of happiness and life satisfaction in Turkey. The author's findings of unemployment status, marital status, relative income, and gender were consistent with previous literature whereas the differences were observed in the estimates of age, absolute income and education.

Eren and Aşıcı (2017) analyzed the determinants of happiness in Turkey between 2004 and 2013 based on TURKSTAT's Life Satisfaction Surveys. The authors found that job satisfaction was as important as being employed; married people were happier only if they were satisfied from their marriage; education brought more happiness only if it helped to increase income; and happiness and income shared a potent and positive relationship.

Kuzu, Elmas-Atay and Gerçek (2019) used the 2015-Household Life Satisfaction Survey data carried out by the Turkish Statistical Institute to investigate the relationship between unemployment, happiness and demographic factors. It was concluded when happiness was examined with regard to demographic factors that it was related with education and age but unrelated with education level. Contrary to many studies carried out on Turkey (Selim, 2008; Eren and Aşıcı, 2017; Susanlı, 2017), gender did not have significant effect on happiness. Employed individuals were happier.

2. METHODS

2.1. Data

A social survey was conducted in January 2019 using stratified sampling method. 980 adults responded to the questionnaire. This study covers four densely populated districts encompassing and surrounding the city center of Adana: Seyhan, Yüreğir, Çukurova and Sarıçam. This stratified sampling method was appropriate to assess socio-demographic differences in different locations. These locations are divided into six different zones with several neighborhoods in each. The survey also included socio-demographic and life satisfaction questions.

Independent variables are gender, age, marital status, family size, education level, job status, monthly income, profession and health status.

Gender (Your gender) 0=female, 1=male

Age (How old are you?) 1=18-24, 2=25-31, 3=32-38, 4=39-45, 5=46+

Monthly individual income level divided into income categories based on minimum wage and poverty line 1=0-2020, 2=2021-3999, 3=4000+

Marital status (what is your marital status?) 1=Married, 2=Engaged, 3=Single 4=Divorced or separated, 5=Widowed

Family size (including yourself how many people lives together in your family) 1=Married, 2=Engaged, 3=Single 4=Divorced or separated, 5=Widowed

Family size (Including yourself how many people lives together in your family)

Education status (What is your education status?) 1=Illiterate, 2=Primary School, 3=High School, 4=Vocational School, 5=University, 6=Master-Doctorate.

Employment status (What is your employment status?) 1=currently paid employee, 2=currently unemployed, 3=unpaid family worker, 4=unemployed for less than 12 months, 5=unable to work due to illness or disability, 6=retired, 7=housewife, 8=student.

Occupation- profession (What is your area of work?) 1=private, 2=public, 3=semi-private, 4=unemployed, 5=self-employed (employer), 6=foundation-association

Health condition (How is your health condition?) 1. very poor, 2. poor, 3. moderate, 4. good, 5. very good.

Where do you live? Central pedestrian zones, public transport zones, secondary pedestrian zones, transit zones, vehicle dependent neighborhoods, rural neighborhoods.

The dependent variable of this study is life satisfaction (LS). The scale from Diener et al. (1985) was used: "In most ways, my life is close to ideal", "My living conditions are excellent", "I am satisfied with my life", "So far I have achieved the important things I want in life", "If I lived my life again I would change almost nothing" 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, 5=strongly agree.

2.2. Diagnostics

Stata and SPSS were used for data analysis. Since the scale reliability of the questionnaire was found to be sufficient (Cronbach $\alpha > 0.80$), the analyzes were started.

Spearman rank correlation was used to test for multicollinearity. In this study, there was no indication of high correlations between independent variables (not shown). Due to multicollinearity between categories of an independent variable, which is quite possible, reference category is changed and an independent variable is removed at the cost of significance.

Before creating a logistic model related to life satisfaction, the model's significance and goodness-of-fit indicators were examined.

A goodness-of-fit test was conducted to investigate whether the logistic model was compatible as a whole.

Related hypothesis:

H₀: Theoretical model represents the data well

H₁: Theoretical model does not represent the data well

Goodness of fit of the proportional odds model with poverty line and education as predictors is tested. The probability (p) values of the tests (Ordinal Hosmer- Lemeshow, Pulkstenis-Robinson(chi2), Pulkstenis-Robinson(deviance) and Lipsitz LR) were greater than 0.05. Thus, the hypothesis Ho: “Theoretical model represents the data well” cannot be rejected. In other words, the model-data fit is sufficient.

Prob>chi²=0.0000 and Pseudo R²(McFadden)=0.0627 values are consistent with previous literature.

For significance of the model, significance of coefficients is tested by

$$H_0: \beta_1 = \beta_2 = \dots = \beta_n = 0$$

$$H_1: \text{At least one } \beta \neq 0$$

The probability value obtained for the relevant hypothesis is p=0.000, and since the significance level is less than 0.05, at least one coefficient is different from zero (therefore, at least one variable is in the model). That is, the model is meaningful (Karagöz, 2018: 83).

2.3. Estimating Marginal Effects in the Interaction Model

The marginal probability effect for the observation of category i and outcome variable of category j is estimated by $ME_j(x_i) = \frac{\Delta P(GH=j | x_i)}{\Delta x_i}$.

Marginal effect of socio-demographics conditional on location of living is $\frac{\Delta P(GH|SI, LOC)}{\Delta SI_i} = \beta_1 + \beta_{12}LOC_j$ or the other way around, marginal effect of

location of living conditional on socio-demographic is $\frac{\Delta P(GH|LOC, SI)}{\Delta LOC_j} =$

$\beta_2 + \beta_{12}SI_i$. Interaction effect is $\frac{\Delta^2 P(GH|SI, LOC)}{\Delta SI_i \Delta LOC_j} = \frac{\Delta^2 P(GH|LOC, SI)}{\Delta LOC_j \Delta SI_i} = \beta_{12}$

which is the coefficient of the interaction term. On the other hand, the mean marginal probability effect includes all other observed values held constant or at their values in the estimation. The mean marginal probability effect (MME) of an ordered categorical variable x_i is estimated by $MME_j(x_i) = \frac{1}{n} \sum_{i=1}^n ME_j(x_i)$ (Hajdu and Hajdu, 2014, p. 117).

2.4. Model

$$LS_i = \alpha_i + \beta_1 S_i + \beta_2 LOC_i + \beta_3 S^*LOC_i + e_i \quad (1)$$

S_i is the i^{th} category of a socio-demographic variable, LOC_i is the i^{th} location and $S*LOC_i$ is socio-demographic difference at i^{th} location, LS_i is ordered categorical response “I am satisfied with my life.”

2.5. Descriptive findings

Table 1 results indicate that “I am satisfied with my life” has the highest mean with 3.19 and highest percentage of life satisfaction with 44.18 percent. Therefore, it is used as the dependent variable of this study.

Table 1: Descriptive statistics of life satisfaction items

| | Frequency distribution | | | | | Mean | Standard deviation |
|--|------------------------|----------|---------|-------|----------------|------|--------------------|
| | Strongly disagree | Disagree | Neutral | Agree | Strongly agree | | |
| In most ways, my life is close to ideal | 12.35 | 25.92 | 26.22 | 33.78 | 1.73 | 2.87 | 1.07 |
| My living conditions are excellent | 12.04 | 26.12 | 28.37 | 32.65 | 0.82 | 2.84 | 1.04 |
| I am satisfied with my life | 8.37 | 14.69 | 29.80 | 44.18 | 2.96 | 3.19 | 1.00 |
| So far I have achieved the important things I want in life | 9.80 | 19.59 | 27.55 | 40.00 | 3.06 | 3.07 | 1.05 |
| If I lived my life again I would change almost nothing | 26.53 | 25.82 | 22.35 | 22.04 | 3.27 | 2.50 | 2.50 |

Table 2 indicates significant correlations of life satisfaction with marital status, education, income and health condition. Health has the highest correlation with life satisfaction.

Table 2: Spearman correlations between LS and socio-demographics

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---------------|-------|-------|-------|-------|-------|-------|-------|---|---|
| 1.LS | 1 | | | | | | | | |
| 2.Age | | 1 | | | | | | | |
| 3.Gender | | | 1 | | | | | | |
| 4.Marital | .06** | .57* | | 1 | | | | | |
| 5.Family size | | -.16* | | -.11 | 1 | | | | |
| 6.Education | .09* | -.41* | | -.42* | | 1 | | | |
| 7.Employment | | -.57* | .13* | -.35* | .14* | .27* | 1 | | |
| 8.Income | .08** | .35* | -.16* | .26* | -.20* | -.12* | -.49* | 1 | |
| 9.Health | .26* | -.11* | | -.12* | | .16* | -.01 | | 1 |
| 10.Location | | .08** | | | | | | | |

Empty cells in lower triangle show no statistical significance

*: $p < 0,01$; **: $p < 0,05$.

3. REGRESSION MODEL ESTIMATIONS

3.1. Gender effect

To estimate the objective spatial effects of men on the probability of life satisfaction compared to women, gender (SEX)-location (LOC) interaction is used in ordered logistic model (2).

$$LS_i = \alpha_i + \beta_1 SEX_i + \beta_2 LOC_i + \beta_3 SEX * LOC_i + e_i \quad (2)$$

Figure 1 shows the objective spatial distribution of effects on the probability of life satisfaction for men versus women at the 95% confidence interval. Outcome=1 indicates low life satisfaction, Outcome=2 indicates moderate life satisfaction, and Outcome=3 indicates high life satisfaction. The $y=0$ line shows that there is no difference in the probabilities between the two genders. It is seen that the effects on the probability of higher life satisfaction, $P(\text{Outcome}=3)$, of men compared to women, decrease in the city center and increase in the rural areas. Male-female gender differences show negative effects on the probability of high life satisfaction in secondary pedestrian, intensive transit and vehicle-dependent neighborhoods, and positive effects in central pedestrian, public transport and rural neighborhoods. This is the opposite for lower life satisfaction.

Conditional marginal effects of men in Table 1 indicates marginal effect of gender conditional on location of living.

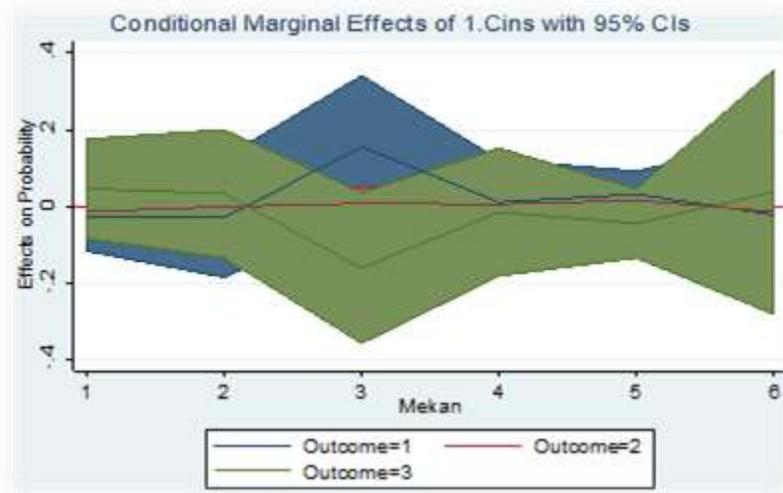


Figure 1. Location effects of gender on probability of life satisfaction.
Mekan=Location

3.2. Age effect

To estimate the objective spatial effects of age on the probability of life satisfaction ordinal logit model (3) is used.

$$LS_i = \alpha_i + \beta_1 AGE_i + \beta_2 LOC_i + \beta_3 AGE * LOC_i + e_i \quad (3)$$

Figure 2 shows that the location effect of age on life satisfaction is very low. When age increases by one year, the probability of a person living in the central pedestrian and secondary pedestrian areas to have high life satisfaction increases by small percentage points (pp).

Average marginal effects of age in Figure 2 indicates the mean marginal probability effect of age.

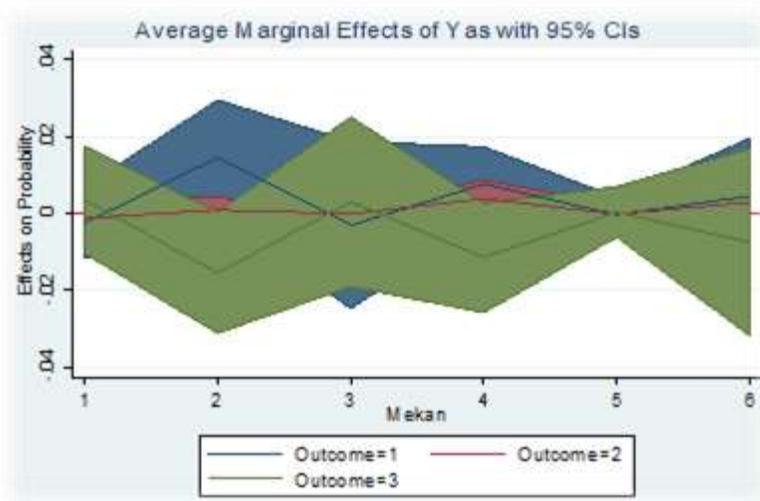


Figure 2. Location effects of age. mekan=location

3.3. Marital status

In order to estimate the objective spatial effects of marital status on the probability of life satisfaction, the marital status (MARITAL) location (LOC) interaction is used in ordinal logit model (4).

$$LS_i = \alpha_i + \beta_1 MARITAL_i + \beta_2 LOC_i + \beta_3 MARITAL * LOC_i + e_i \quad (4)$$

The objective spatial effects on the probability of life satisfaction of those who are single, divorced or separated, widowed and engaged vs married are given in Figure 3. It shows those who are 1 married, 2 single, 3 divorced or separated, 4 widow and 5 engaged. Locations are coded with 1 central

pedestrian zones, 2 public transportation locations, 3 secondary pedestrian zones, 4 intensive transit intersections, 5 vehicle dependent neighborhoods, 6 rural neighborhoods.

Location effects on life satisfaction of widows relative to married ones were significant ($p < 0.001$) in central pedestrian, public transportation and secondary pedestrian areas. These effects were positive in the central pedestrian and secondary pedestrian zones and negative in the public transport zones. In central pedestrian areas, the probability of higher life satisfaction for widowed persons increases by approximately 48.3 pp relative to married persons. This increase is 57.2 yp in the secondary pedestrian zones. In transit zones, the probability of higher life satisfaction among widowed persons decreases by approximately 37.3 pp relative to married persons.

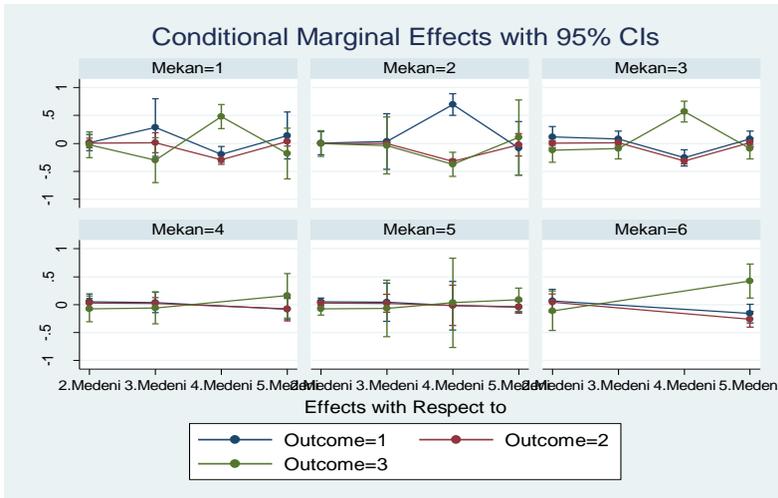


Figure 4. Objective spatial effects of marital status. mekan=location

The effects on the probability of higher life satisfaction of those who are engaged relative to those who are married in rural neighborhoods were positive (0.42) and significant ($p < 0.01$). In rural neighborhoods, those who are engaged are 42 pp more likely to have higher life satisfaction than those who are married.

According to average marginal effect results, being married vs single increases probability of higher life satisfaction by 11.8 pp on average at significance level $p < .01$.

3.4. Employment status

To estimate the location effects of employment status on the probability of life satisfaction, ordinal logit model (5) is used.

$$LS_i = \alpha_i + \beta_1 EMP_i + \beta_2 LOC_i + \beta_3 EMP*LOC_i + e_i \quad (5)$$

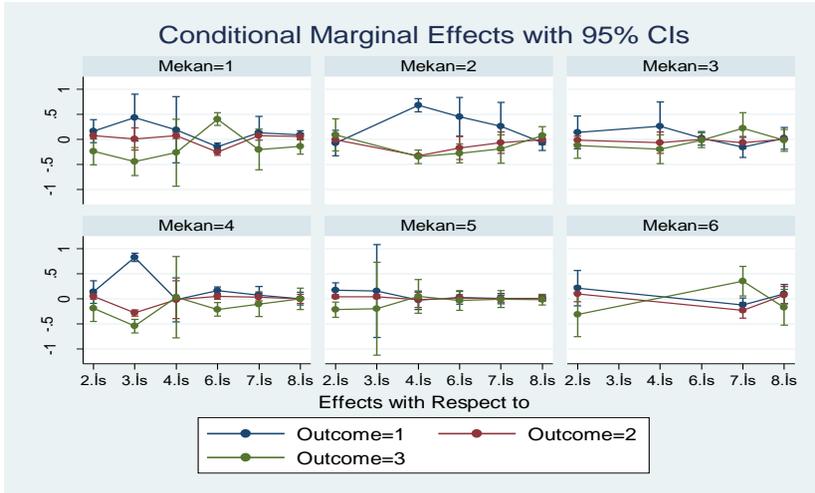


Figure 6. Location effects of job status on probability of life satisfaction.
mekan=location

In Figure 6, 1=currenty paid employee, 2=not working at the moment, 3=unpaid family worker, 4=unemployed for less than 12 months, 5=no observation in this category, 6= retired, 7= housewife, 8=student.

Locations effects on the probability of life satisfaction of those who are currently unemployed, unpaid family worker, unemployed for less than 12 months, retired, housewife, and student, respectively, are demonstrated in Figure 6 relative to currently paid employee. The effects of retirees on the probability of higher life satisfaction relative to wage currently paid employee were positive (0.40) and significant ($p < 0.001$) in central pedestrian areas, and negative (-0.278 and -0.210, respectively) and significant ($p < 0.005$) in public transport and transit intersections.

The effects on the probability of higher life satisfaction for those who were unemployed for less than 12 months compared to currently paid employee were negative (-0.348) and significant ($p < 0.001$) in public transportation locations.

The effects on the probability of higher life satisfaction of the currently unemployed vs currently paid employee were negative (-0.215) and significant ($p < 0.01$) in vehicle dependent neighborhoods.

The effects of unpaid family workers on the probability of higher life satisfaction relative to currently paid employee were negative (-0.444 and -0.544, respectively) and significant ($p < 0.005$ and $p < 0.0001$, respectively) in central pedestrian areas and transit junctions.

The effects of retirees on the probability of higher life satisfaction relative to currently paid employee are positive (0.40) and significant ($p < 0.001$) in central pedestrian areas, negative (-0.278 and -0.210, respectively) and significant ($p < 0.005$) at public transport and transit intersections. The effects on the probability of higher life satisfaction of those who are unemployed for less than 12 months compared to currently paid employee are negative (-0.348) and significant ($p < 0.001$) in public transportation locations.

The effects on the probability of higher life satisfaction of the currently unemployed compared to currently paid employee were negative (-0.215) and significant ($p < 0.01$) in vehicle-dependent neighborhoods.

3.5. Income

To estimate location effects of income (poverty line) on the probability of life satisfaction, ordinal logit model (6) is used

$$LS_i = \alpha_i + \beta_1 POVERTY_i + \beta_2 LOC_i + \beta_3 POVERTY_i * LOC_i + e_i \quad (6)$$

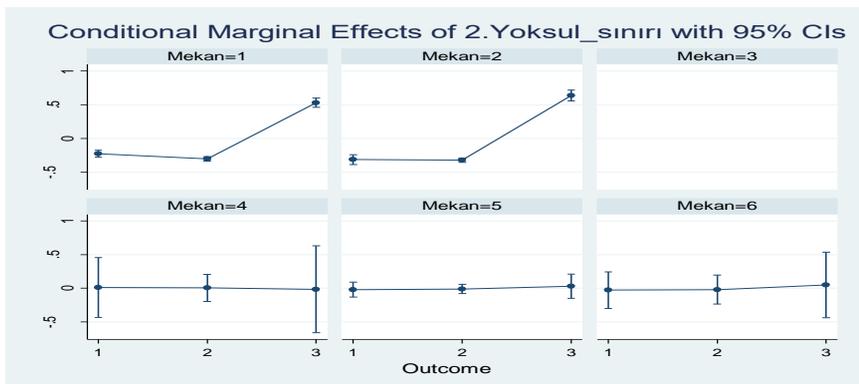


Figure 7. Location effects of the poverty line on the probability of life satisfaction.
mekan=location

Location effects on the probability of life satisfaction of those whose income is above the poverty line relative to those whose income is below the poverty line are given in Figure 7. These effects were positive (0.530 and 0.636, respectively) and significant ($p < .0001$ for both) in the central pedestrian and secondary pedestrian areas.

In Figure 7, Outcome=life satisfaction, 1.low, 2.medium, 3.high. 2.Yoksul_sınırı indicates poverty line ≥ 4000 TL.

3.6. Health

To estimate location effects of health condition on the probability of life satisfaction, ordinal logit model (7) is used.

$$LS = \alpha_i + \beta_1 SAGLIK_i + \beta_2 MEKAN_i + \beta_3 SAGLIK * MEKAN_i + e_i \quad (7)$$

Location effects on the probability of life satisfaction of those with moderate and good or very good health status, respectively, relative to those with poor or very poor health status are given in Figure 8.

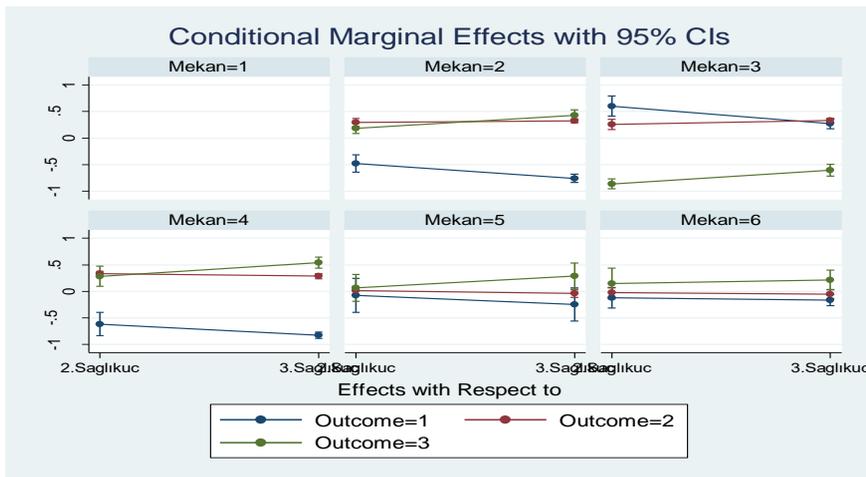


Figure 8. Location effects of health status on probability of life satisfaction.
Mekan=Location

In Figure 8, 2.Saglıkuc indicates moderate health and 3.Saglıkuc indicates good or very good health relative to reference category 1. very bad or poor health;. Outcome=1 indicates low life satisfaction, Outcome=2 indicates moderate life satisfaction, and Outcome=3 indicates high life satisfaction.

The effects on the probability of higher life satisfaction of those with good or very good health relative to those with poor or very poor health were significant in all regions except central pedestrian zones. While the effects were 0.433, -0.602 and 0.542 and significant ($p < .0001$) in public transportation, secondary pedestrian and transit zones, respectively, the effects were 0.288 and 0.218 and significant ($p < 0.05$) in vehicle dependent and rural neighborhoods.

3.7. Education

Having undergraduate and graduate education vs primary school increases probability of higher life satisfaction by 18.6 pp and 25.6 pp on average both at significance level $p < .01$.

CONCLUSION

This study investigated socio-demographic differences conditional on locations of living in Adana. Empirical findings such as higher income, employed, better health, married more satisfied with life were generally in line with previous literature.

Average marginal effect results indicate that being unemployed for less than 12 months is the strongest variable explaining higher life satisfaction. The second is physical health. The most decreasing life satisfaction probability is of middle age relative to youngest category.

The study focused on the probabilistic effects of socio-demographic differences conditional on locations of living. Probability of men to have high life satisfaction was greater than that of women in rural neighborhoods whereas less in secondary pedestrian areas. It can be implied that women are oppressed in rural areas and they will get rid of this pressure when they move to secondary pedestrian areas. Age effects on higher life satisfaction were significant in central and secondary pedestrian areas. In reference to married persons, widowed persons have the higher probabilities of higher life satisfaction in the same areas. In central pedestrian zones, retired vs currently employed persons seem to have higher probability of higher life satisfaction but it is otherwise for unemployed persons for less than 12 months vs currently employed persons. In this study, income over poverty line in the second and central pedestrian zones seem to have the highest probability of higher life satisfaction. Health effects were more significant in transit and public transport zones. However, most significant effects seem to be conditional on secondary and central pedestrian zones.

Consequently, people living in secondary and central pedestrian zones (Adana city center) are more satisfied with their lives.

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CHAPTER 6
THE EVALUATION OF ARTIFICIAL INTELLIGENCE-
TITLED PUBLICATIONS IN THE CONTEXT OF
COMMUNICATION

Dr. Atikullah GHIASEE ¹

¹ Health Sciences University, Dr. Sami Ulus Gynecology, Child Health and Diseases Education and Research Hospital, Ankara/TÜRKİYE; atik0093@hotmail.com, ORCID: 0000-0003-2671-5533

INTRODUCTION

Artificial intelligence technologies have experienced remarkable development, especially in the last ten years, with advances in machine learning and deep learning techniques. Besides, despite the great potential of artificial intelligence technologies in solving problems, problems with the lack of practical use and knowledge of using artificial intelligence in the field of communication still remain. In this respect, it is very important to present the bibliometric analyzes of the studies on the subject using science mapping techniques. Because the studies done in the past on any study and the examination of the development of these studies in the process can be evaluated in terms of determining the future trends related to the subject. However, in cases where the literature is very large, revealing the main trends of development and relationships is just as difficult. In this respect, in cases where the research area is very wide, bibliometric methods can be done using some modern science mapping tools to analyze the thematic development and relationship networks of the study subject.

The term bibliometrics can be expressed as the methods used in the quantitative analysis of data obtained from scientific publications with statistical and mathematical tools and giving some clues about the related subject, discipline, field, countries, institutions and cooperation between authors (Kurutkan, Orhan, Kaygısız, 2017; Kurutkan and Orhan, 2018).

In this study, prepared in this context, scientific mapping techniques and publications titled artificial intelligence were evaluated in the context of communication. Thematic and strategic development maps of this integrated subject were created.

1. LITERATURE REVIEW

1.1. Artificial Intelligence

Artificial intelligence, defined as the ability of a machine to imitate intelligent human behavior (Russel et al. 2010), continues to spread not only in the retail, service, and manufacturing industries, but also as a part of daily life. Recent developments in artificial intelligence have led to the integration of more powerful and consequential artificial intelligence technologies into daily life. Thanks to artificial intelligence, which has gained the ability to understand and respond to human speech, language-based assistants such as Apple's Siri or Amazon's Alexa and algorithms used in news sites and e-commerce platforms have become a part of our lives today Zeffass et al. 2020).

Today artificial intelligence, which has a significant impact on data processing, analysis, and prediction, is defined as systems or machines that imitate human intelligence and can develop interactively based on collected information while performing their tasks (Kaczmarek-Śliwińska, 2019).

Research targets in the field of artificial intelligence have changed over the years. From a Computer Science and Information Technology perspective, artificial intelligence is often described in different eras with techniques that include theorem-proof, heuristic searching, game playing, expert systems, neural networks, Bayesian networks, data mining, agents, and more recently, deep learning (Wang, 2019).

Experts say that the rise of artificial intelligence will make humanity better in the next ten years, but many think that this rapid rise in artificial intelligence may negatively affect humanity in some respects (Andersen et al. 2018)

1.2. Communication

In communication processes, we see the transformations caused not only by socio-organizational changes but also by technological changes. Since the 1990s, a changing field of communication has been observed as a result of the emergence of the internet and its use in the functioning of organizations (Śliwińska, 2019). For example, communication is one of the issues that has come to the fore in recent years, especially in the health sector (Kayral, Beylik and Orhan, 2016).

For most of the people, communication is understood as a process that takes place between themselves and another person. Communicating means sending messages to social media followers, texting a loved one, talking to a friend, presenting to coworkers, or reading the latest news written by a journalist. Communication has also been defined by its reviewers as a uniquely human process (Guzman, 2018).

Yet, communication is conceptualized as more than the examination of roles in a process and the transfer of information (Carey, 1989). Central to the development of communication theory is the focus on the meanings and effects of messages (Rogers, 1994) and how that meaning enters people's relationships with one another, as Schramm (1973) explains:

“Thus, when we study communication, we examine people – people who interact, influence, being influenced, inform and be informed, reach and be taught, entertain and be entertained each other and their

groups, organizations, and societies. To understand human communication, we need to understand how people relate to one another. (s. 3-4)"

Communication is also a tool for people to acquire information about their world (Berger , to form an understanding of Me and the Other (Mead, 1967), and to contribute to the shape of society (Cooley, 1897). Communication research, then, is about who we are, who we are for one another, and the reality we create (Carey, 1989). From this perspective, the view of human-machine communication shifts from the process between humans and technology to the creation of meaning between human and machine (Guzman, 2018).

1.3. Artificial Intelligence and the Communication

For over 70 years, artificial intelligence and communication studies have progressed in different ways. Researches on artificial intelligence have focused on the role of human intelligence in communication, including the ability to communicate within a machine (Frankish & Ramsey, 2014). Besides, communication has historically been conceptualized primarily as a human process mediated by technology (Guzman & Lewis, 2020).

Whether completely admitted or not, communication is essential to both the theory and practice of artificial intelligence. In Alan Turing's article "Computing Machinery and Intelligence" describing machine intelligence, the relationship between communication and machine is clearly seen. Although the title "artificial intelligence" is a product of the 1956 Dartmouth Conference, Turing's 1950 paper and his "pretend play" or what is now routinely called the "Turing Test" is what defines and characterizes the discipline. Although Turing started his essay by proposing to consider the question of "Can machines think?" then he realized the terminological difficulties about this question. For this reason, he also recommends alternative research that can be expressed in relatively clear words as he defines it (Gunkel, 2012).

The computer, whether it is a timesharing host, a networked computer, or any of a wide variety of mobile and smart devices, has never been a fixed or neutral channel for human interaction (Williams, 1982).

Today, when computers gain the position of another social actor with whom people communicate and interact, it is time to take the impact and importance of this situation seriously in communication studies, while

transitioning from human-machine communication, which many would describe as the field of science fiction, to machine-machine communication provided by the Internet of Things (IoT) technology.

2. METHOD

The research framework of the study topic "Evaluation of Artificial Intelligence-titled Publications in the context of Communication (EAITPCC)" is presented in Figure 1. The First Step is to select a database with high-quality data to be able to perform bibliometric analysis of the EAITPCC study topic.

The Web of Science (WOS) database was preferred as the data source for the bibliometric analysis of the EAITPCC topic. WOS was chosen because of the huge amount of abstracts and references from high-quality and influential scientific articles. WOS is the world's most comprehensive academic database covering many scientific disciplines (Lv, Wang, 2021).

The second step is to extract and filter data from the preferred database. The following search strategy was used while searching the WOS database.

```
TI="artificialneuralnetworks" OR
TI=: "naturallanguageprocessing" OR
TI= "fuzzylogic" OR TI= "expertsystems" OR
TI="machinelearning" OR
TI="deeplearning" OR
TI= "artificialintelligence") AND LANGUAGE: (English) Refined by:
TOPIC: (communication) AND DOCUMENT TYPES: (ARTICLE OR
REVIEW) Timespan: 1975-2020. Indexes: SCI-EXPANDED, SSCI,
ESCI.
```

Articles containing EAITPCC concepts were filtered through the WOS database system. The access date is 28.06.2021. While searching WOS for research data, articles for 2021 were not retrieved. The study includes a total of 1806 articles published between 1975 and 2020.

The third step includes the bibliometric analysis of the obtained data. Three software packages were used for bibliometric analysis. Within the Bibliometrix program, VOSviewer, and Excel program, a comprehensive overview of the EAITPCC research field was taken and a content analysis of the field was made.

Bibliometrix is new open-source software for science mapping techniques (Aria, Cuccurullo, 2017).

VOSviewer is another free software tool developed by Van Eck and Waltman that can be used to create and visualize bibliometric maps of scientific publications, journals, authors, institutions, keywords and countries (Van Eck, Waltman, 2010).

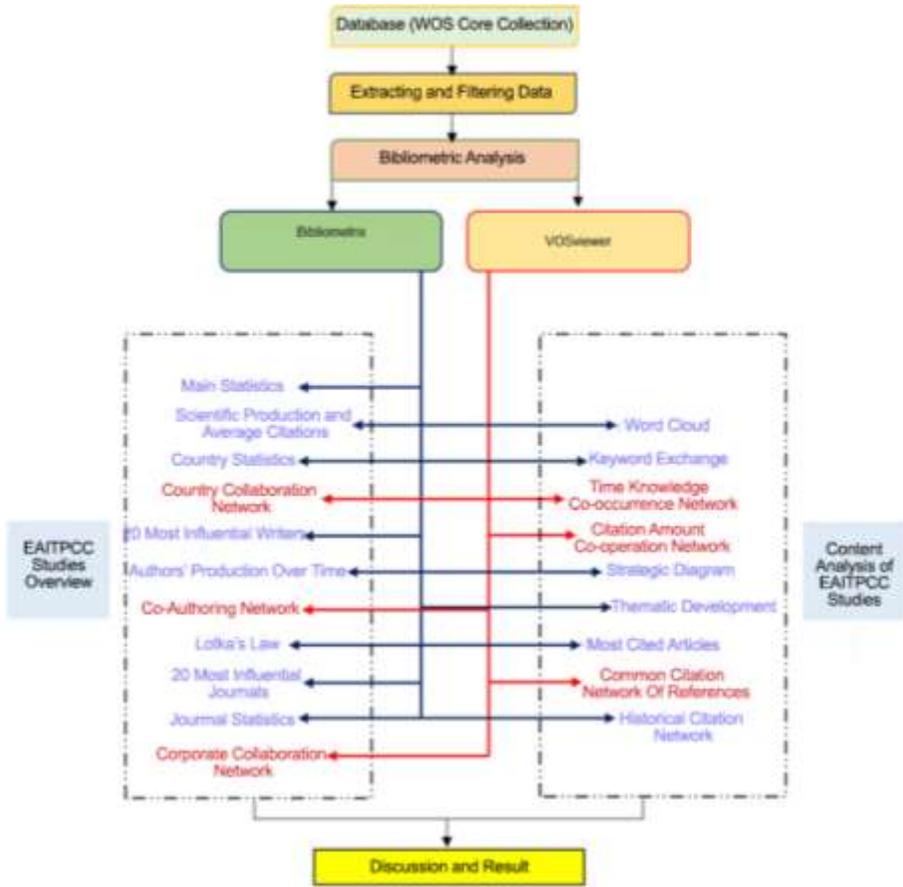


Figure 1. Workflow Of Science Mapping

In our study, 1806 articles were analyzed in two parts. In the first part, an overview of the domains of articles, journals, researchers, institutions, and countries on EAITPCC is given. In the second part, the intellectual structure of the EAITPCC field was examined with content analyzes using word and citation analysis, and hot topics, thematic development, and research focus of the research were determined. The results of the bibliometric analysis are presented in the next two sections.

2.1. An Overview Of Eaitpcc Studies

2.1.1. Main Information

EAITPCC seems to have been used for the first time in 1985 as the first term for study. It was used in a total of 718 sources and 1806 documents between 1985 and 2020. In document types, articles are the most document type with 1622 numbers. The number of authors is 6095, the number of studies with one author is 120, and the number of studies with multiple authors is 5975. While the number of studies per author is 0.296, the number of authors per study is 3.37. Other statistical information is presented in Table 1.

Table 1. Main Information

| Description | Results | Description | Results |
|------------------------------------|-----------|--------------------------------------|---------|
| MAIN INFORMATION ABOUT DATA | | DOCUMENT CONTENTS | |
| Timespan | 1985:2020 | Keywords Plus (ID) | 2464 |
| Sources (Journals, Books, etc) | 718 | Author'sKeywords (DE) | 5251 |
| Documents | 1806 | AUTHORS | |
| Averageyearsfrompublication | 3.9 | Authors | 6095 |
| Averagecitationsperdocuments | 15.63 | Author Appearances | 7392 |
| Averagecitationsperyearperdoc | 3.861 | Authors of single-authored documents | 120 |
| References | 67038 | Authors of multi-authored documents | 5975 |
| DOCUMENT TYPES | | AUTHORS COLLABORATION | |
| Article | 1622 | Single-authored documents | 121 |
| Article; earlyAccess | 28 | Documents per Author | 0.296 |
| Article; proceedings paper | 56 | AuthorsperDocument | 3.37 |
| Review | 99 | Co-AuthorsperDocuments | 4.09 |
| Review; earlyAccess | 1 | Collaboration Index | 3.55 |

2.1.2. Annual Scientific Production and Citation Per Year

Annual Scientific Production and Annual Average Citations on EAITPCC were obtained with the help of Bibliometrix, as shown in Figure 2.

It is seen that the annual number of articles in the EAITPCC field did not change significantly from 1985 to 2011, it started to increase from 2012 and the highest annual number of articles (745) was reached in 2020.

Annual Scientific Production Trendline has been added to the graph. The equation representing the trend line is presented on the graph.

Regarding the annual average citations of each document; the publications in 2017 received the most annual average citations with 14.6. This was followed by 2018 with an average of 11.8 publications. After 2017, there is a decreasing trend in annual average citations. It can be considered that the number of citations of the publications between 2018 and 2020 is significant, especially since more recent publications require time to be cited.

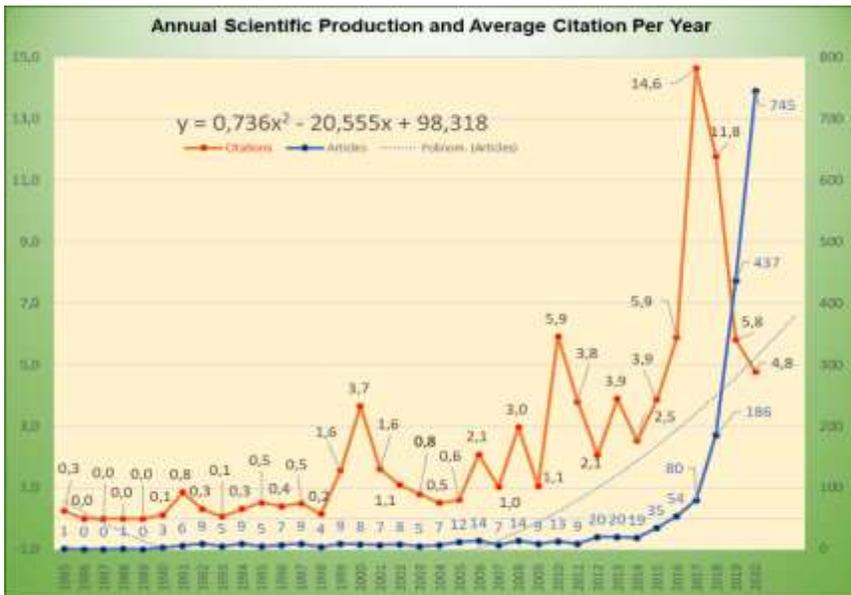


Figure 2. Annual Scientific Production and Citation Per Year

2.1.3. Country Statistics

To further analyze the details of country-level EAITPCC studies, the top 20 countries of the corresponding author are presented in Table 2. From Table 2, it is understood that China, the USA, Korea, and India have dominant positions in the field of EAITPCC and are still among the leading countries in terms of related authors.

Table 2. Top 20 Countries of Related Authors in the EAITPCC Study

| Country | TPC | SCP | MCP | MCP_Ratio |
|----------------|-----|---------|-----|-----------|
| CHINA | 469 | 0,26245 | 297 | 172 |
| USA | 294 | 0,16452 | 238 | 56 |
| KOREA | 120 | 0,06715 | 83 | 37 |
| INDIA | 112 | 0,06267 | 96 | 16 |
| UNITED KINGDOM | 85 | 0,04757 | 48 | 37 |
| CANADA | 68 | 0,03805 | 37 | 31 |
| SPAIN | 49 | 0,02742 | 36 | 13 |
| GERMANY | 48 | 0,02686 | 32 | 16 |
| AUSTRALIA | 43 | 0,02406 | 27 | 16 |
| JAPAN | 41 | 0,02294 | 29 | 12 |
| ITALY | 37 | 0,02071 | 25 | 12 |
| SAUDI ARABIA | 31 | 0,01735 | 18 | 13 |
| IRAN | 29 | 0,01623 | 21 | 8 |
| TURKEY | 29 | 0,01623 | 26 | 3 |
| FRANCE | 21 | 0,01175 | 11 | 10 |

| | | | | |
|-------------|----|---------|----|----|
| BRAZIL | 20 | 0,01119 | 12 | 8 |
| PAKISTAN | 20 | 0,01119 | 10 | 10 |
| NETHERLANDS | 18 | 0,01007 | 10 | 8 |
| GREECE | 15 | 0,00839 | 12 | 3 |
| MALAYSIA | 15 | 0,00839 | 8 | 7 |

TPC = Total number of publications by the corresponding author's country,
 SCP = Single country publications,
 MCP = Multiple country publications,
 MCP_Ratio = MCP/TCP

The academic interaction among the top 30 countries regarding EAITPCC research is illustrated in Figure 3. In order to create a co-authoring network through VOSviewer, the minimum number of publications for each country is 15. In this network, each node represents a country. The size of the node corresponds to the number of publications produced by a country, while the thickness of the lines between the two countries represents the extent of academic cooperation.

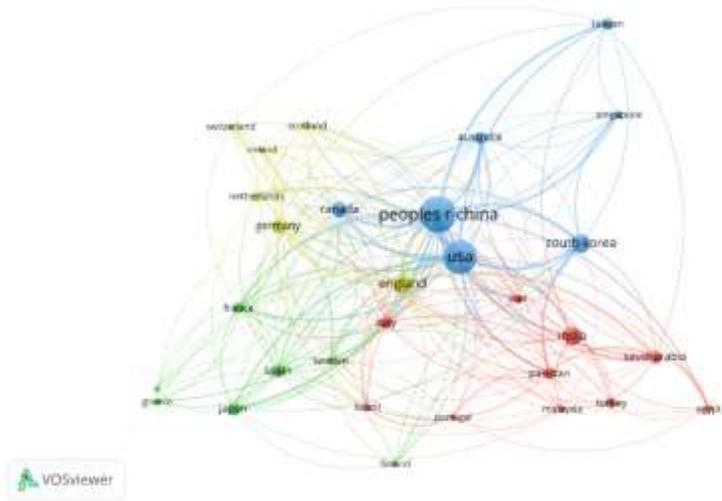


Figure 3. Collaboration Network among the Top 30 Countries in the EAITPCC Field for Co-Authoring

It can be seen from Figure 3 that there is strong cooperation between China-USA and China-Canada. In terms of Co-Authorship, countries were included in 4 different clusters. China leads the blue cluster, India leads the red cluster, England leads the yellow cluster and Japan leads the green cluster. It is possible to say those cluster leader countries also have cooperated with other cluster leader countries and other countries.

2.1.4. Author Statistics

The h-index, g-index, m-index, total citations (TC), the total number of publications (NP), and first year of publication in the EAITPCC field (PY-baseline) of the top 20 influential authors who contributed the most to EAITPCC articles are presented in Table 3.

Table 3. Statistics of the 20 Most Influential Authors in the EAITPCC Research Field

| Author | h_index | g_index | m_index | TC | NP | PY_start |
|----------|---------|---------|---------|-----|----|----------|
| LI GY | 10 | 16 | 2,5 | 807 | 16 | 2018 |
| ZHANG Y | 8 | 14 | 0,727 | 257 | 14 | 2011 |
| GUI G | 7 | 9 | 1,75 | 805 | 9 | 2018 |
| LI X | 7 | 7 | 0,636 | 139 | 7 | 2011 |
| LI Y | 6 | 7 | 0,667 | 387 | 7 | 2013 |
| WANG J | 6 | 8 | 1,2 | 80 | 10 | 2017 |
| WANG Y | 6 | 10 | 0,857 | 121 | 10 | 2015 |
| YANG J | 6 | 9 | 1,5 | 572 | 9 | 2018 |
| ZIBAR D | 6 | 7 | 0,857 | 345 | 7 | 2015 |
| ALAZAB M | 5 | 5 | | 74 | 5 | |
| HANZO L | 5 | 8 | 1 | 489 | 8 | 2017 |
| JIN S | 5 | 6 | 1 | 319 | 6 | 2017 |
| KATO N | 5 | 7 | 1 | 553 | 7 | 2017 |
| LEE H | 5 | 9 | 1,25 | 88 | 10 | 2018 |
| LEE Y | 5 | 6 | 1 | 78 | 6 | 2017 |
| LI J | 5 | 8 | 1 | 328 | 8 | 2017 |
| LIU Y | 5 | 8 | 0,714 | 71 | 10 | 2015 |
| WEN CK | 5 | 6 | 1 | 319 | 6 | 2017 |
| YE H | 5 | 5 | 1,25 | 603 | 5 | 2018 |
| CHEN YF | 4 | 4 | 0,333 | 45 | 4 | 2010 |

Note: NP = Number of publications, TC = Total citations, PY_start = Publicationyearstarting.

The "Hirsch index" or "h-index" was designed by Jorge Hirsch. According to Hirsch, if the h index of a researcher is "x", it can be said that this researcher has "x" publications cited by other researchers by "x" amount. Accordingly, an influential scientist has not one or two highly cited articles, but a series of well-cited articles. It is a unique and simple performance index that includes both quantity and visibility of broadcasts for micro-level implementation. It is an author-level scale that tries to measure the productivity and citation effect of the publications made by scientists. Since H-indexes are affected by the citation traditions and methods of scientific disciplines, it is very difficult to compare this index with disciplines (Bornmann & Daniel, 2007).

The H-index is a less appropriate measure of academic achievement for young scientists because they do not have enough time to cite papers yet. One way to facilitate comparison among scientists with academic careers of different lengths is to divide the h-index by the number of years he has been academically active (measured as the number of years since the first published paper). This index created by Hirsch is defined as the m-index (Harzing, 2012). The G-index was developed by Leo Egghe in 2006. It is an alternative to the h-index, which does not average the number of citations, to measure the global citation performance of a series of articles (Egghe, 2006).

As a result, when the authors' index scores were evaluated in terms of all these three indicators (h-g-m index), Li GY had the highest score in all three indices. Although he started his publication life in 2018, the same author has the highest number of citations and the highest publication amount.

Likewise, Gui G, who started his publication life in 2018, has a considerable number of publications that focus on the subject of study.

Figure 4 shows the publications over time by the authors who have published on the EAITPCC. The size of the circles represents the number of publications, and the darkness represents the total number of citations received per year. The authors with the most publications are Zhang, Wang J, Li, and Wang Y. The author with the oldest publication in this field is Yang J. It is seen that many authors have actually been involved in this field in the last 5 years. As can be seen from the boldness of the circles, the authors with the highest total citations per year are LiGY, Gui G, and Li Y.

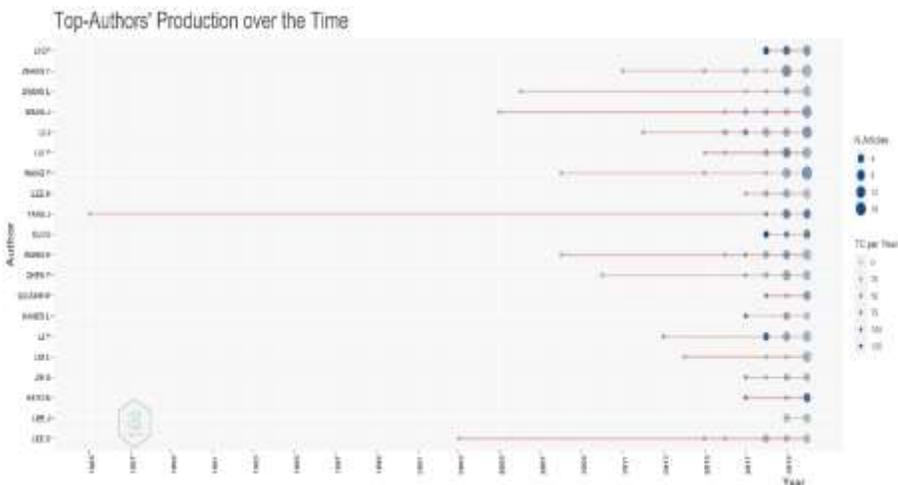


Figure 4. Production of Top Writers Over Time

In addition, when the minimum number of publications was set to five in VOSviewer, 31 co-authors out of 6095 authors met the threshold. A collaboration network of 31 authors is presented in Figure 5. In the co-authorship network between the authors, the majority of the authors were placed under 7 clusters. The green cluster with LiGy and the red cluster with Gui G are clusters with significant cooperation. Apart from these two clusters, the blue cluster with Hanzo L, the turquoise cluster with Liu Y, the purple cluster with Lee H, the orange cluster with Niyato D, and the yellow cluster with Kato N are the other clusters. Apart from these authors, authors such as Guizani M and Zibar D could not be found in a network of co-authorship, although they published a large number of publications.



Figure 5. Co-Authoring Network Between Authors

The publications of the authors working in the field of EAITPCC according to Lotka's law are presented in Figure 6. Lotka Law predicts that 60% of the authors contribute with one article, 15% with 2 articles, and 7% with 3 articles in a field of study (Birinci, 2008).

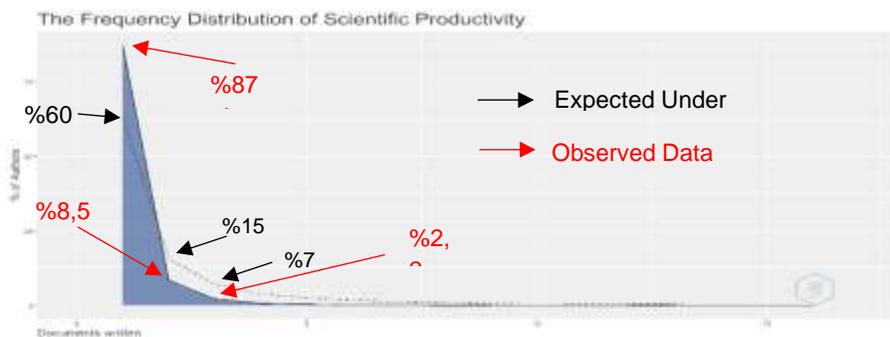


Figure 6. Lotka's Law Chart

When the articles and authors are examined within the framework of Lotka law, those who contributed to the EAITPCC study area with one article accounted for 87.4% of the authors, 8.5% of the contributors with two articles, 2.2% of the contributors with three articles, 0.8% of the contributors with four articles and 0.4% of the contributors with five articles. It is understood that the author distribution of the articles in the EAITPCC study area does not comply with Lotka's law. Despite this, 34 authors with more than five publications can be considered as deepening in the EAITPCC field and can be considered as core authors.

2.1.5. Journal Statistics

Articles on the EAITPCC are published in a wide variety of journals. The 1806 articles we obtained come from 718 different journals. The number of EAITPCC-related articles and the h-index of each journal was used to identify the most relevant and influential journals in the EAITPCC research field. Figure 7 shows the top 20 journals that have published the most articles on EAITPCC. These 20 journals can be considered as the most influential resources in the EAITPCC field.

As can be seen in Figure 7, IEEE Access and Sensors are the first two journals to publish the most articles on EAITPCC. Journals with the highest H-index are IEEE Access and IEEE Communications Surveys and Tutorials. It is possible to say that IEEE Access journal is the most influential journal in the field of EAITPCC.

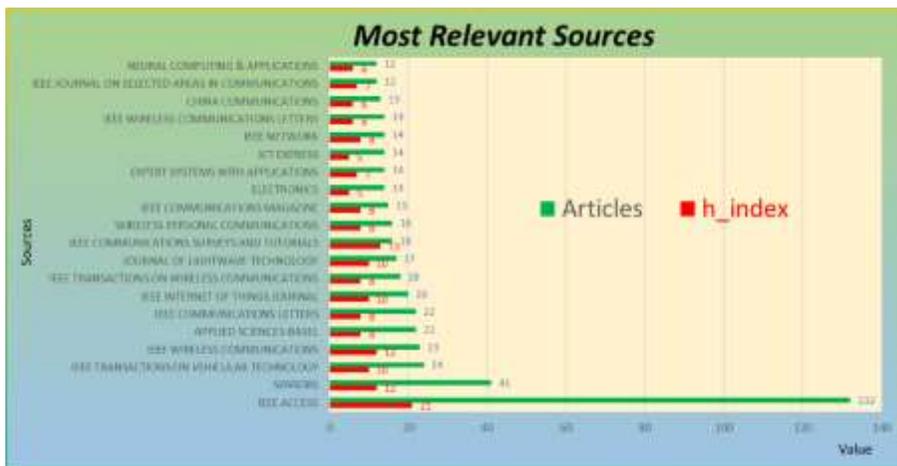


Figure 7. 20 Most Influential Journals on EAITPCC

Table 4 shows the first 20 journals in order of a total number of publications. In these top 20 journals, 26% (479/1806) of the total articles are published. IEEE Access is the journal with the most publications, representing 7.3% (132/1806) of total articles: Sensors follows closely. The most cited journals on EAITPCC are IEEE Access and IEEE Communications Surveys And Tutorials. In addition, the number of citations per article, which shows the ratio between the number of citations and the number of documents for each journal, was also analyzed. IEEE Communications SurveysAndTutorials offers the highest value with an average of 92 citations per article. It is possible to say that IEEE Transactions on VehicularTechnology and AppliedSciences-Basel journals, which started their publication life in 2018, have become influential in the field of research very quickly.

Table 4. Statistics of the 20 Most Influential Journals in the EAITPCC Research Field

| Source | NP | TC | TC/N P | h_index | PY_start |
|--|-----|------|-----------|---------|----------|
| IEEE ACCESS | 132 | 1546 | 12 | 21 | 2015 |
| SENSORS | 41 | 396 | 10 | 12 | 2015 |
| IEEE TRANSACTIONS ON VEHICULAR TECHNOLOGY | 24 | 934 | 39 | 10 | 2018 |
| IEEE WIRELESS COMMUNICATIONS | 23 | 906 | 39 | 12 | 2003 |
| APPLIED SCIENCES-BASEL | 22 | 116 | 5 | 8 | 2018 |
| IEEE COMMUNICATIONS LETTERS | 22 | 391 | 18 | 8 | 1998 |
| IEEE INTERNET OF THINGS JOURNAL | 20 | 373 | 19 | 10 | 2017 |
| IEEE TRANSACTIONS ON WIRELESS COMMUNICATIONS | 18 | 271 | 15 | 8 | 2006 |
| JOURNAL OF LIGHTWAVE TECHNOLOGY | 17 | 489 | 29 | 10 | 2009 |
| IEEE COMMUNICATIONS SURVEYS AND TUTORIALS | 16 | 1474 | 92 | 13 | 2013 |

| | | | | | |
|--|----|-----|----|---|------|
| WIRELESS PERSONAL COMMUNICATIONS | 16 | 119 | 7 | 8 | 2002 |
| IEEE COMMUNICATIONS MAGAZINE | 15 | 321 | 21 | 8 | 2001 |
| ELECTRONICS | 14 | 55 | 4 | 5 | 2018 |
| EXPERT SYSTEMS WITH APPLICATIONS | 14 | 164 | 12 | 7 | 1992 |
| ICT EXPRESS | 14 | 112 | 8 | 5 | 2016 |
| IEEE NETWORK | 14 | 142 | 10 | 8 | 2018 |
| IEEE WIRELESS COMMUNICATIONS LETTERS | 14 | 474 | 34 | 6 | 2018 |
| CHINA COMMUNICATIONS | 13 | 315 | 24 | 6 | 2017 |
| IEEE JOURNAL ON SELECTED AREAS IN COMMUNICATIONS | 12 | 155 | 13 | 7 | 1997 |
| NEURAL COMPUTING & APPLICATIONS | 12 | 174 | 15 | 6 | - |

NP = Number of publications, TC = Total citations, TC/NP = Citationsperpaper, PY_start = Publicationyearstarting,

2.1.6. Kurumların / Üniversitelerin Performansları

Figure 8 shows the collaborative network of major institutions contributing to EAITPCC research. At least 10 publication criteria were accepted as a basis and 38 institutions provided this value. The graphic was obtained from the VOSviewer program. According to the graph, institutions took place in 7 different clusters as turquoise, orange, red, green, blue, purple, and yellow. While most articles are published by Beijing University, it is seen that the institutions in the red cluster are the institutions that cooperate the most. Although the institutions in the lower square have a sufficient number of publications, they are not in cooperation with other institutions. The number of articles and the countries where the institutions are located were obtained from the "Bibliometrix, Authors, MostRelevantAffiliations" tab. The strongest collaboration is between Georgia InsTech and Southeast Univ. Another strongest collaboration is between Georgia InsTech and Tsinghua Univ.

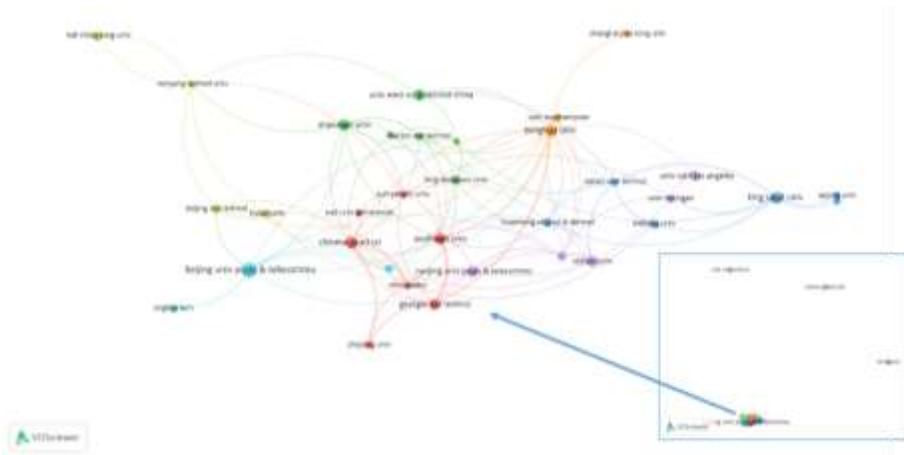


Figure 8. Institutional Collaboration Network for EAITPCC Research

2.2. CONTENT ANALYSIS OF THE EAITPCC RESEARCH FIELD

In this section, keyword analysis and citation analysis are considered together to identify key elements of the knowledge base of the EAITPCC research field. Some bibliometric methods have been used to present the content analysis of this area.

2.2.1. Keyword Analysis

Keywords in articles are used by authors as a clear, representative, and concise description of the research content. The keywords are asked to best represent the research article. Therefore, it makes sense to determine the current topics and themes of a research topic based on keyword analysis (Garfield).

2.2.1.1. Frequency Analysis for Keywords

Bibliometrix was used to obtain information about the keyword frequency (repeat count) of the EAITPCC research field. The word cloud of the keywords created using Bibliometrix is shown in Figure 9. The word cloud is a clear and complete graphical display of current issues in the EAITPCC research field.

With the help of the Word Cloud, it is easy to find different areas of association and identify the most dominant terms used throughout the term (Orimoloye, Ololade 2020).

In Figure 9, the top 50 most used keywords are highlighted. On the right side of the figure, the number of usage of the 20 most used keywords can be seen. The size of the keywords was correlated with the frequency of their appearance in the data set. The most used keywords are "Machine Learning" and "Deep Learning". However, it is noteworthy that words such as "Big Data", "Resource Management" and "Security" are included in the word cloud. In general, it is seen that resource management and security issues come to the fore along with the concept of learning.



| Terms | Frequency |
|---------------------------|-----------|
| machine learning | 499 |
| deep learning | 371 |
| artificial intelligence | 200 |
| fuzzy logic | 99 |
| wireless communication | 71 |
| internet of things | 62 |
| neural networks | 56 |
| training | 49 |
| channel estimation | 47 |
| artificialneuralnetworks | 43 |
| optimization | 42 |
| naturallanguageprocessing | 41 |
| 5g mobile communication | 36 |
| big data | 34 |
| mimocommunication | 31 |
| resourcemanagement | 31 |
| security | 31 |
| wireless sensor networks | 31 |
| convolutionalneural | |
| network | 30 |
| classification | 28 |

Figure 9. Word Cloud and Number of Repetitions of Keywords in the EAITPCC Research Field

2.2.1.2. Keywords Trend of Change Analysis

To better understand the variation of the study subject in different time periods, the 31-year timeframe from 1990 to 2020 is divided into eight 4-year timeframes. The last slice is determined as 3 years. While there was no significant increase in the use of keywords from 1990 to 2010, it is observed that there has been a significant increase in the use of keywords, especially after 2014. Unlike other keywords, "Machine Learning" and "Deep Learning" dominate the study topic. In addition to these keywords, the words "artificial intelligence" and "FuzzyLogic" have become frequently used in recent years. Although there is an increase in the use of other keywords, it can be said that it is limited. With this method, the most frequently used keywords of the EAITPCC domain obtained from Bibliometrix are visualized in Figure 10. In Figure 10, the top figure shows the usage of 10 keywords over time, and the bottom figure shows the usage of the keyword on a yearly basis. While the keyword "ExpertSystems" was popular in 1985, the word "Machine Learning" became popular in 2020.

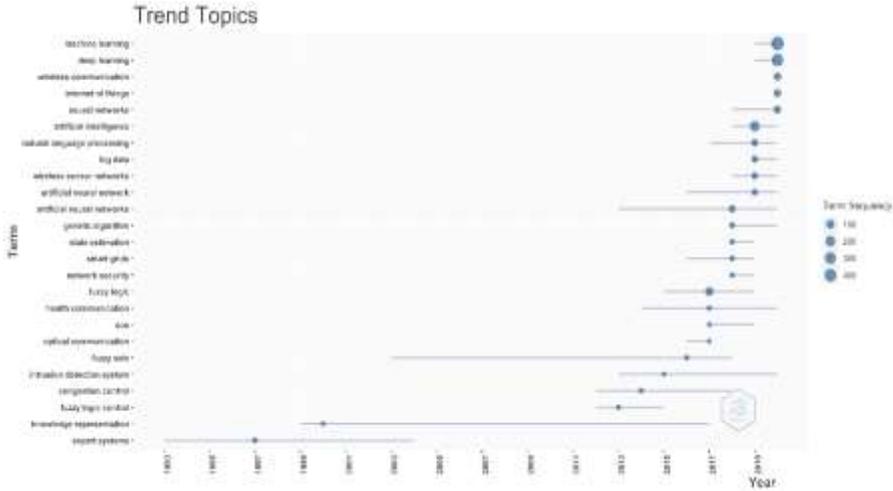
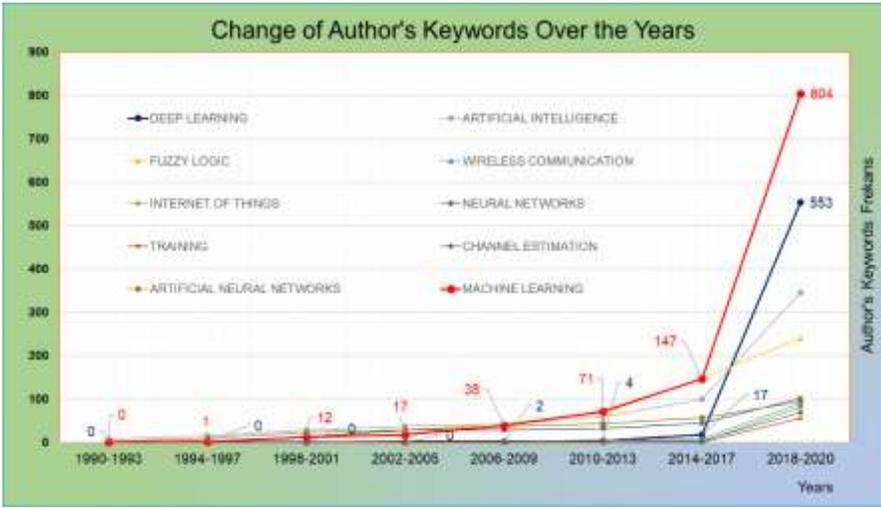


Figure 10. Change of Keyword in EAITPCC Field by Keyword Frequency

2.2.1.3. Keywords Co-occurrence Analysis and Tendency Networks

The co-occurrence network of the first 32 high-frequency keywords of the EAITPCC literature was obtained using VOSviewer software (Van Eck and Waltman 2010), as shown in Figure 11. The minimum number of occurrences of a keyword was determined as 20 and 32 of 5251 words met the threshold value. In the co-occurrence network, the overall distance between keywords reflects their relationships (Van Nunen, Le et al. 2018).

The EAITPCC keyword co-occurrence network consists of 5 clusters. These clusters are respectively; Machine Learning, Deep Learning, FuzzyLogic, Internet of Things, and ConvolutionalNeuralNetwork. From the

size of the circles, it is understood that the words Machine Learning, Deep Learning, ArtificialIntelligence are mostly repeated. From the network line thickness between them, it emerges that Machine Learning-Artificial Intelligence and Machine Learning-Deep Learning network connections are the highest.

While the Machine Learning keyword is formed together with the words Deep Learning, ArtificialIntelligence, Wireless Communication, and Internet of Things; The word Deep Learning is formed together with the words Machine Learning, Wireless Communication, Internet of Things, Neural Networks, Training, Channel Estimation, and ConvolutionalNeural Network.

Figure 11 also shows how the keywords of the articles have gained interest over the years. Keywords describe the core content of the articles and clearly show the diversity of knowledge areas in a given field (Su and Lee, 2010).

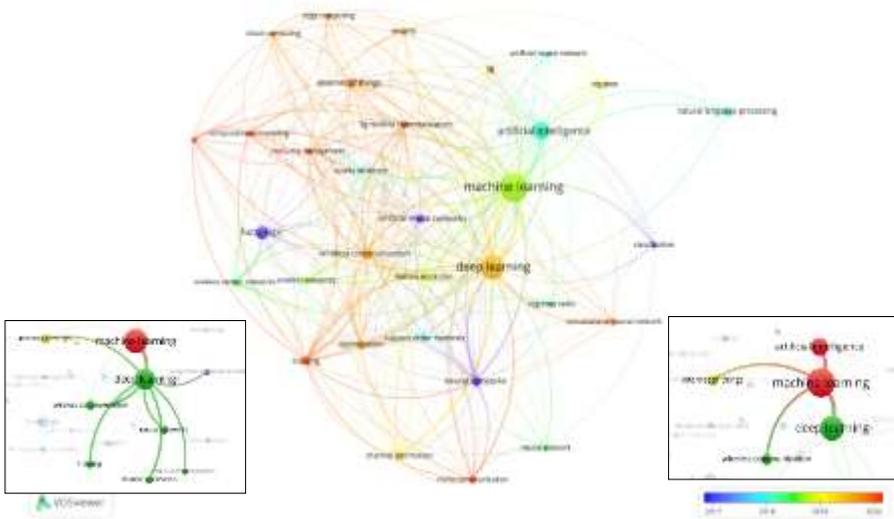


Figure 11. Co-occurrence Network with Time Information of High-Frequency Keywords in EAITPCC Literature

It is understood that the terms obtained from the articles published between 2017 and 2020 have been used more in recent years as they approach warm colors, and preferred in past years as they approach cold colors. While the most used keywords towards 2017 are shown in blue, the most used keywords towards 2020 are shown in red. While the most used keywords in 2017 were FuzzyLogic, Neural Networks, and Classifications, the most used

keywords in the 2020s were Training, Data Models, Internet of Things, MimoCommunication, Wireless Communication, 5g Mobile Communication, ComputationalModeling and Resource Management.

Here, it should not be concluded that blue keywords are used less, in fact, it should be considered that many studies on these topics are still needed, but research on red topics has gained predominance in recent years.

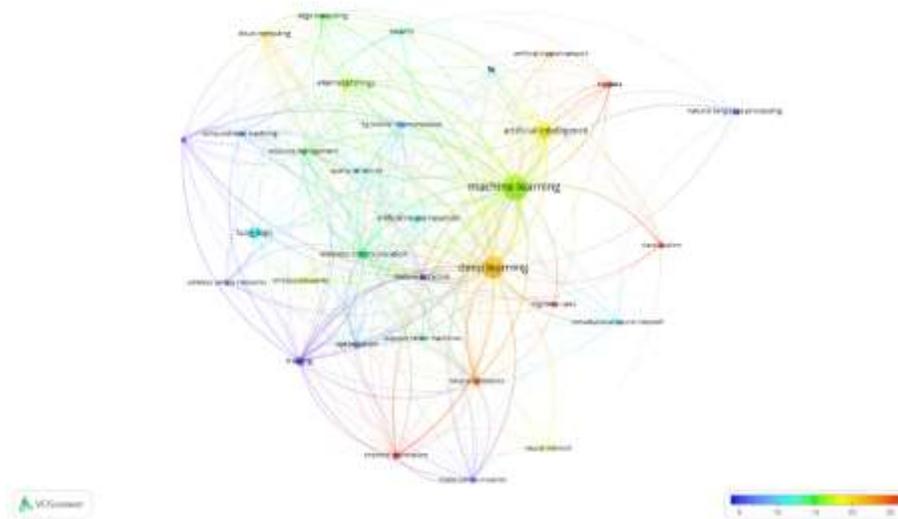


Figure 12. Co-occurrence Network with Average Citation Count of High-Frequency Keywords in EAITPCC Literature

Figure 12, on the other hand, was created according to the average number of citations of the articles in which the terms were used as keywords. It can be said that the citation numbers are higher as the nodes in this network approach red, and the citation numbers are lower as they approach blue. To put it more clearly, the average number of citations for articles using keywords in warm colors is high, while the average number of citations for articles with keywords in cool colors is lower. When the data were examined, it was determined that the articles using keywords such as Big Data, Classification, CognitiveRadio, and Channel Estimation were cited more.

2.2.1.4. Thematic Development Analysis

The thematic development of EAITPCC research between 1985 and 2020 is analyzed from a dynamic perspective. The research period (1985-

2020) was divided into three successive sub-periods, taking into account the number of documents and a fixed time window. Although the determination of sub-periods covering equal time segmentation is more used, the first sub-period was fixed at 26 years due to limited publications in the early years. The last three sub-periods were determined to cover 3 years each. As a result, the entire research period (1985–2020) was divided into four consecutive subperiods (1985–2011, 2012–2014, 2015–2017, 2018-2020).

Strategic diagrams of the EAITPCC study topic for each sub-period are presented in Figure 13. These diagrams were created by Bibliometrix using a common word analysis based on the authors' keywords. In order to identify the most emphasized and detailed themes, author keywords that appeared at least five times were used for analysis. Bibliometrix has grouped the most frequent keywords into theme clusters. The first 500 keywords were used during the analysis. The words in the clusters are the keywords with the highest frequency in that cluster. The size of the globes is proportional to the keyword frequency of the name of each theme marked in each field.

Each sub-figure of Figure 13 is divided into four quadrants representing different themes. To scale each quarter-theme set, two measures of centrality and intensity were used. Density represents the thematic map as the y-axis and the centrality as the x-axis. Centrality grades the importance of the chosen theme, and intensity grades the development of the chosen theme (Nasir and Shaukat et al., 2020).

Each period is divided into four quarters;

“Engine Themes” is the 1st quarter theme and is in the top right. These themes express high density and high centrality and are developed and necessary motor themes (Cobo, López-Herrera et al., 2011). They are important for shaping the EAITPCC study subject and include well-developed themes.

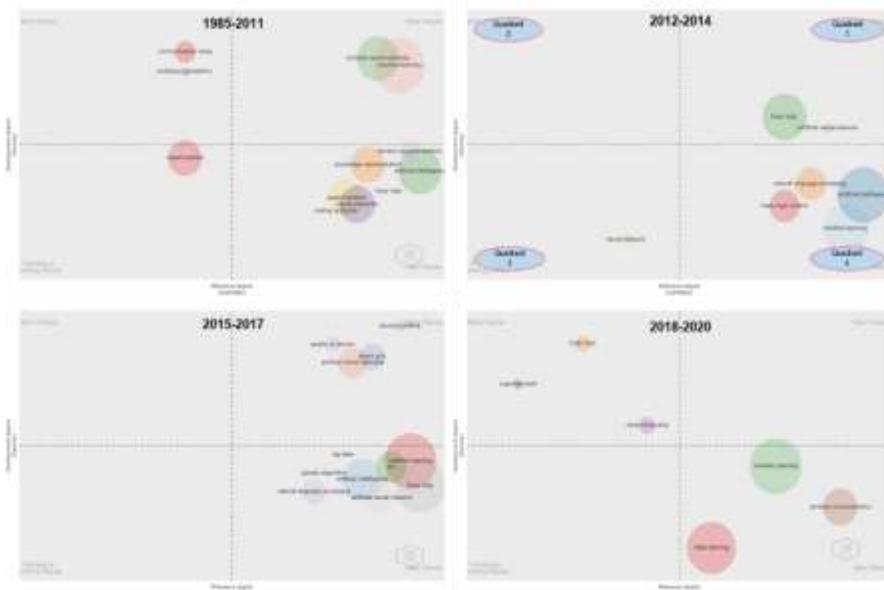


Figure 13. EAITPCC Studies Strategic Diagram (1985–2020)

The words in the "Engine Themes" theme are important and well-developed words to shape the EAITPCC study topic. These words were clustered in 2 clusters in 1985-2011, in 2 clusters in 2012-2014, in 3 clusters in 2015-2017, and in 0 clusters in 2018-2020 within the theme.

"Highly Developed and Isolated Themes" is the 2nd quarter theme and is located at the top left of the thematic map. This theme expresses higher density and lower centrality. It is highly developed but isolated (Cobo, López-Herrera et al., 2011). Developed and isolated themes are important for the development of the EAITPCC study topic but have not been sufficiently developed.

The words in the "HighlyDevelopedandIsolatedThemes" theme are important for the development of the EAITPCC study topic but are not developed enough. These words were clustered in 2 clusters in 1985-2011, 0 clusters in 2012-2014, 0 clusters in 2015-2017, and 3 clusters in 2018-2020 within the theme. In 2018-2020, the first cluster is "cloud computing", the second cluster is "fuzzy logic" and the third cluster is "cognitive radio".

"Emerging or Declining Themes" is the 3rd quarter theme and these are the themes that appear in the lower-left part of the thematic map. (Cobo, López-Herrera et al., 2011). These themes are not only poorly developed but are of low importance to the EAITPCC study subject.

The words in the “Emerging or Declining Themes” theme do not have much significance for the EAITPCC study subject. These words were clustered in 1 cluster in 1985-2011, in 1 cluster in 2012-2014, in 0 clusters in 2015-2017, and in 0 clusters in 2018-2020 within the theme.

“Basic and transversal themes” is the 4th quarter theme and is located at the bottom right of the Thematic map. They are low density, high centrality themes. Much research has been done on these core themes and they have well-developed interconnections (Cobo, López-Herrera et al., 2011). It is vital to the EAITPCC study subject.

It is seen that the most repeated and most related words are included in the “Basic and Transversal Themes” theme. This indicates that these words have well-developed interconnections and are of vital importance to the EAITPCC study topic. Themes with a large number of publications are mainly in the fourth quarter, which is quite logical. Because the main and variable themes are the main focus of the EAITPCC study. These words were clustered in 7 clusters in 1985-2011, 4 clusters in 2012-2014, 8 clusters in 2015-2017, and 3 clusters in 2018-2020 within the theme. In 2018-2020, the first cluster is “machine learning”, the second cluster is “deep learning” and the third cluster is “wireless communication”.

To assess how EAITPCC themes have developed and changed historically, the four-term Thematic Evolution Mapping, presented in Figure 14, was conducted in addition to the four-term Thematic Map.

To perform Thematic Evolution Mapping, the Sankey Diagram was used. In the Sankey diagram, each anchor point represents a set of themes tagged with the keyword with the highest repeat count and corresponding sub-period (Shi, Duan et al., 2020).

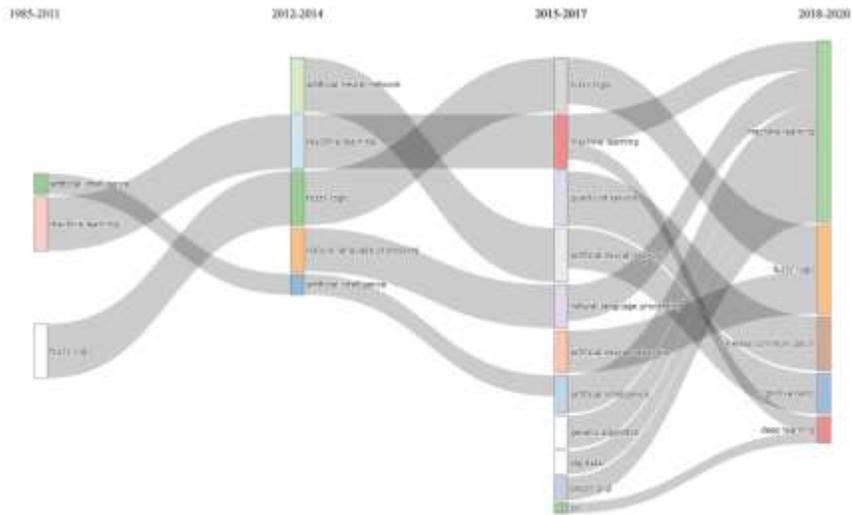


Figure 14. Thematic Development of EAITPCC Studies (1992–2019)

The basics in Figure 13 were used while creating the Thematic Evolution Map in Bibliometrix. When the diagram is examined, it is seen that the number of themes increased for a while and then grouped under a few basic clusters. There are 3 themes in the first term, 5 in the second term, 11 in the third term, and 5 in the last term. Machine Learning and FuzzyLogic themes remained in existence for four semesters. Recently, it is seen that Machine Learning, FuzzyLogic, wirelessCommunication, CognitiveRadio, and Deep Learning themes are derived from other sub-themes. The Machine Learning theme, which is the most important theme of the last period, is fed by Machine Learning, Natural Language Processing, ArtificialNeural Network, artificial intelligence, GeneticAlgorithm, Big Data, and Smart Grid sub-themes. In other words, these 7 sub-themes were combined under the Machine Learning theme.

The artificial intelligence theme has kept its effectiveness in the first 3 terms and has been under the Machine Learning theme in the last period. While the theme clusters increased in the period covering the years 2015-2017, the theme clusters provided subject integrity under certain headings in the period covering the years 2018-2020.

2.2.2. Citation Analysis

Citation analysis was conducted to identify and explore the most frequently cited publications on the EAITPCC topic and their relationships. Citation analyzes are widely used to examine the underlying intellectual structure and development dynamics of a research topic. Table 5 shows the 20 most cited articles in the EAITPCC study, in descending order of local citation (LC) and global citation (GC) counts.

The local citation can be used as an indicator to represent the impact of these publications on the EAITPCC study. The local citation refers to the number of citations of a document cited by articles in the collected dataset (1806). Global Citation refers to the number of times an article is cited in the WOS core collection database. It represents the impact of an article on the WOS core collection database circle. Both LC (97) and GC (565) values of O'Shea(2017) were higher than other publications. In Table 5, the most cited article in recent years belongs to Huang (2020) with LC (15) and GC (56) values.

Normally, articles published in the early years of the publication period have more time to be cited. Newly published articles do not have enough time to be cited. Annual Local Citations (LC/YYP) and Annual Global Citations (GC/YYP) parameters were used to eliminate the negative effect of the publication years of the recently published articles and to show the effect of the publication years. In terms of LC/YYP and GC/YYP, the first two publications are O'Shea (2017) and Ye (2018). With the contents of these two articles, it can be stated that they may be the most effective articles on the EAITPCC study.

Another concept developed for the most-cited authors is Local Citation Percentage. According to the percentage of Local Citations, the most effective article belongs to Huang (2020) with a value of 26.79%. The value of 26.79% represents the ratio of the number of citations of a document cited by articles in the collected dataset (1806) to the number of times it is cited in the WOS core collection database.

To do more content analysis of the EAITPCC topic, we can examine Co-Citation Analysis and Historical Citation Analysis.

Table 5. Top 20 Local Articles in the EAITPCC Field

| Document | YP | LC | LC/YYP | GC | GC/YYP | LocalCitations % (LC/GC) |
|--------------------|------|----|--------|-----|---------|-----------------------------|
| O'SHEA T, 2017 | 2017 | 97 | 24,250 | 565 | 141,250 | 17,17 |
| YE H, 2018 | 2018 | 78 | 26,000 | 399 | 133,000 | 19,55 |
| JIANG CX, 2017 | 2017 | 49 | 12,250 | 407 | 101,750 | 12,04 |
| GUI G, 2018 | 2018 | 39 | 13,000 | 254 | 84,667 | 15,35 |
| FADLULLAH ZM, 2017 | 2017 | 36 | 9,000 | 315 | 78,750 | 11,43 |
| HUANG HJ, 2018 | 2018 | 32 | 10,667 | 248 | 82,667 | 12,90 |
| DORNER S, 2018 | 2018 | 29 | 9,667 | 211 | 70,333 | 13,74 |
| BKASSINY M, 2013 | 2013 | 25 | 3,125 | 233 | 29,125 | 10,73 |
| HUANG HJ, 2019 | 2019 | 25 | 12,500 | 172 | 86,000 | 14,53 |
| QIN ZJ, 2019 | 2019 | 22 | 11,000 | 109 | 54,500 | 20,18 |
| MOHAMMADI M | 2018 | 20 | 6,667 | 247 | 82,333 | 8,10 |
| O'SHEA TJ, 2018 | 2018 | 17 | 5,667 | 177 | 59,000 | 9,60 |
| KIM M, 2018 | 2018 | 16 | 5,333 | 74 | 24,667 | 21,62 |
| HUANG HJ, 2020 | 2020 | 15 | 15,000 | 56 | 56,000 | 26,79 |
| THRANE J, 2017 | 2017 | 14 | 3,500 | 84 | 21,000 | 16,67 |
| DOSTER T, 2017 | 2017 | 14 | 3,500 | 68 | 17,000 | 20,59 |
| SIMEONE O, 2018 | 2018 | 14 | 4,667 | 92 | 30,667 | 15,22 |
| ALKHATEEB A, 2018 | 2018 | 14 | 4,667 | 87 | 29,000 | 16,09 |
| CHEN MZ, 2019 | 2019 | 14 | 7,000 | 139 | 69,500 | 10,07 |
| RATENDRAN S, 2018 | 2018 | 13 | 4,333 | 122 | 40,667 | 10,66 |

Year of Publication (YP), LocalCitations (LC), YYP= Year 2020-Year of Publication, Global Citations (GC)

2.2.2.1. Co-Citation Analysis

A total of 68368 references cited by 1806 articles on EAITPCC studies form the citation basis of the EAITPCC study subject. Co-citation analysis, which measures the frequency of co-cited publications, is used here to explore the EAITPCC citation base from a static perspective (Van Nunen, Le et al., 2018). Co-citation analysis helps identify the strongest articles on the identified work and can express co-citation relationships.

As shown in Figure 15, VOSViewer software was used to obtain the co-citation network of cited sources of the EAITPCC study topic. In VOSViewer software, the common citation network is visualized using a 35 times citation threshold. There are 23 nodes in total in the network. In Figure 15, each node represents an article. The size of the nodes is proportional to the number of citations for each article, and the lines between the nodes indicate common citation relationships. The thicker the line, the more the two publications were used in the other publications.

While creating common citation networks, the cases where two articles are cited together in other articles are examined. The more often these articles appear in other articles, the larger their nodes in the co-citation network will become and the closer to each other will be. It is seen that 23 authors, who have an important position in working on EAITPCC on the network, are

grouped in red, green, yellow, and blue colors. Authors represented by nodes of the same color and close to each other appear more often together in references to other articles.

The biggest nodal point belongs to Lecun (2015). It is possible to say that O'Shea (2017), Gui (2018), Ye (2018), and Wang (2017) are both close to each other and have more common references due to the thick bond line between them.

The fact that the nodes are the same color indicates a similar topic among these articles. The Co-citation network shows how references from publications on the EAITPCC study topic are grouped together. Red and blue clusters, blue and yellow clusters, blue and green clusters are located close to each other. The blue cluster is located in the center of all clusters. The red cluster and the green cluster are located far from each other. It can be stated that the articles in the red and green clusters are not shared with each other.

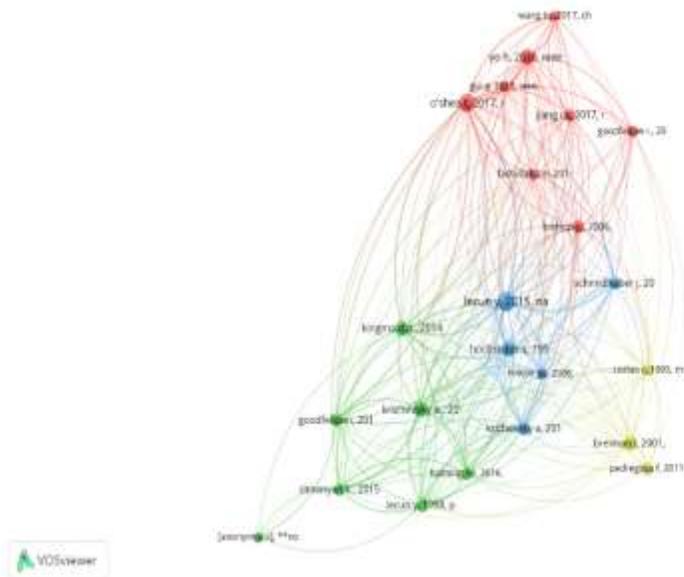


Figure 15. Common Citation Network of Cited References on EAITPCC

The red cluster is the largest cluster in the co-citation network. This cluster was formed around the publication of O'Shea (2017) and Ye (2018). The blue cluster is located in the middle, and the publication of Lecun (2015) forms a cluster in the center. Although the Green Cluster was formed far from the Red Cluster, it has formed a cluster around the publication of Krizhevsky (2017). The second cluster with the most co-cited articles is the green cluster.

The yellow cluster is the cluster with fewer commonly cited articles and is clustered around the Breiaman (2001) publication.

2.2.2.2. Historical Citation Analysis

Historical citation analysis provides a living perspective on the EAITPCC study subject. The historical citation network of the EAITPCC study topic was created using functions from the R-based Bibliometrix, as shown in Figure 16. This image illustrates the evolution of research focuses of key literature on the EAITPCC study over time.

The historical citation network was formed as a single cluster with 17 nodes. Digging deeper into the full text of these 17 key publications can help to understand the evolution of research focus on the EAITPCC study.

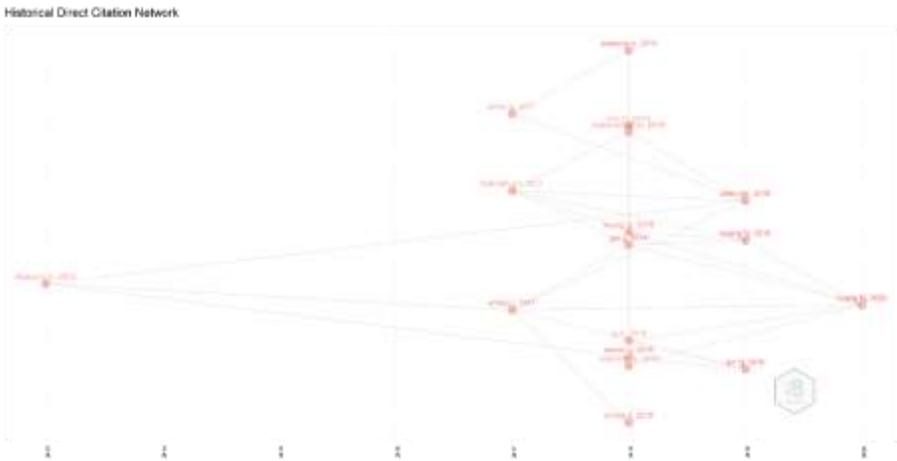


Figure 16. Historical Citation Network of the EAITPCC Field

In general, 9 of the first 17 articles were published in 2018. The first article to enter the historical citation network is the Bkassiny (2013) article, cited by 3 articles. Fadlullah (2017) and O'Shea (2017) in 2017 were cited by 5 articles after him.

Articles in 2018 were mostly cited by one article and cited from 1 article. Chen's (2019) article in 2018 cited from 5 articles. The Huang (2020) article in 2020 was inspired by many studies by citing 6 sub-articles. The articles he cited are from the years 2017-2018-2019.

When Figure 16 is examined together with Table 5, O'Shea's (2017) publication can be considered as the dominant publication of the EAITPCC study subject with 97 local citation points. The higher the local citation value,

the more widely cited (targeted within a specific research flow) the article. A low Local Citation value indicates that the article has spread to other research streams or that it has links with other research areas. Huang (2020) has a low local citation score (15). In this case, it is possible to say that this publication is related to many fields.

3. CONCLUSION

Present communication systems have become extraordinarily large and complex in this age of big data. Machine learning, deep learning, neural networks, NLP (Natural Language Processing), which are sub-fields of artificial intelligence, offer new approaches for emerging problems. Of particular interest is the study of artificial intelligence at the intersection with the study of communication (Yu, 2019; Nah, 2020).

This study deals with the keywords and thematic development analysis, citation analysis, the performance of the countries, authors, journals, institutions, and universities that stand out in these studies in communication and artificial intelligence studies.

Since the evaluation of publications titled artificial intelligence (AI) in the context of communication started in 1985, this study revealed the course of different themes related to the subject in international indexed journals between 1985 and 2020.

With the advancement of technology in this area of research, it is seen that "machine learning", "deep learning" and "artificial intelligence" have started to take their place in the literature as one of the remarkable themes. However, in this table, some words that we start to hear frequently in our daily life, such as "Big Data", "Internet of Things", "Security" (Security), and "Natural Language Processing" appear to be on the plan.

When the countries of the authors who analyze the interaction between artificial intelligence and communication are examined, it is not surprising that the countries that invest the most in artificial intelligence such as China, the USA, Korea, India, and England are in the first place. The strong cooperation between China-USA and China-Canada within the scope of academic cooperation shows that there is cooperation on artificial intelligence in the global sense.

Today, artificial intelligence tools are used intensely to solve problems in communication systems. Although not all communication experts agree, developments in artificial intelligence will be able to eliminate the problems people experience in communication and increase the quality and

effectiveness of communication. With the advent of artificial intelligence, computer systems will be able to complete or augment tasks that require human intelligence in areas such as speech recognition, visual perception, and decision making - on a much larger scale than we could do on our own. Therefore, machines can be trained to determine what an audience is responding to (trust, participation, listening, acting), and then the machine can be trained to measure enough factors in those communications (how we use our words, voices, gestures) that might influence those responses, thereby improving the way we communicate (Zandan, 2021).

This study considers implications not only for theoretical and methodological approaches but also for policymakers and practitioners. When the relevant literature is examined, no other research with similar science mapping techniques has been found, and it is considered that this study can contribute to the literature in this respect.

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CHAPTER 7

EVALUATION OF WEDDINGS AND WEDDING MEALS

IN TERMS OF GASTRONOMY TOURISM, MUGLA

SAMPLE

Lec. Dr. Selma ATABEY¹

¹ Muğla Sıtkı Koçman University, Ortaca Vocational School, Cookery Programme, Mugla, Türkiye, s.atabey@mu.edu.tr, ORCID: 0000-0001-7676-1760

INTRODUCTION

One of the cultural values is culinary culture. Anatolian culinary culture is the supporter of many emotions and social events. Whether this social event is positive or negative does not change the situation. Socially, in sadness, happiness and joy, it has traditionally been supported by many ritual meals that have come from the past to the present. Examples such as a soldier's meal, a funeral dinner, a wedding meal can be given and these examples can be multiplied. There may be different dishes for each ritual, and some dishes are included in almost every event. It is possible to see regional differences along with the effects of traditional Turkish culture in the determination of these dishes. While Keskek can be an example of Turkish culture, the unique dishes and beverages of the region reflect its differences. In addition, the traditional activities applied on these special days also reveal the rich spectrum and colorfulness of cultural values.

It is known that in today's tourism understanding, cultural values that are far from the sea, sand and sun triad are considered as attraction elements. Gastrotourism is one of the indicators of this idea. Although local dishes can be an attraction in itself, when enriched with the culture of the region, it will create a much more effective tourism attraction. Getting to know the food in a wedding concept, experiencing the wedding and the food in its natural environment will affect the recognition and choice of the region.

1. LITERATURE REVIEW

The cultural values of the societies affect the lifestyle, diet, health status and even the way of life of the individuals who make up the society. However, cultural values are formed by the influence of many factors such as the economic situation of societies, lifestyle, geography, climate, educational status, history, migrations, wars and marriages. While the culture is formed over time, it is adopted and accepted by the society and transferred to future generations. One of the cultural values is culinary culture. Products produced in the region or found and collected and hunted take their place in local dishes. Due to the climate structure, it is expected that the meals prepared will provide refreshment or give energy. This is why in cold regions where the continental climate is dominant, products with plenty of oil, molasses, and

spices are consumed, or in hot places, cool, cold, yoghurt and sour dishes are preferred because they are refreshing.

It can be stated that Turkish culinary culture consists of the combination of different cultures from Central Asia to the present day (Halıcı, 2009). The kitchen is a system contains many cultural elements, material or spiritual it has created with sociological and cultural changes (Şahin, 2012). As it can be understood at this point, the experiences of the society affect and shape the culinary culture. In addition to daily consumption, food preparations and culinary culture in transition periods differ in societies. One of the transition periods is weddings, which are thought to provide a transition to a new period in human life with marriage. Wedding dinners are considered as one of the transition period meals (Adıgüzel, 1997).

The word “wedding” comes from the root “button”, which means to tie, knot (Yakıcı, 1991). Today, it is possible to base the use of the term "head binding" for marriage or wedding, based on this origin. In *Divanu Lügati-Türk*, a Turkish-Arabic dictionary written by Mahmud of Kashgar in Baghdad between 1072-1074, the word meaning bağlama is also given as "titun" (yakıcı, 1991). As in the past, wedding ceremonies strengthen the bonds between the individuals that make up the society (Berber, 2009), as well as serve the same purpose today and ensure the continuity of the traditions. Such cultural traditional ceremonies are the features that differentiate society from others (Beşirli, 2010). it is valuable for the sustainability of social identity that not only the dishes, but also the rituals and situations of these dishes are carried to future generations and kept alive (Samancı, 2018). At this point, studies on special day meals, which are also called transition periods, were examined. Some of those mentioned about wedding meals are shown in Table 1.

Table 1. Examples of works that mention wedding dinners

| Author / Authors | Year | Subject matter |
|-------------------------|-------------|---|
| Bodur et al., | 1996 | Konya wedding food and calorie values |
| Güldemir and Işık | 2011 | Wedding dinners in Nevşehir dishes |
| Demir and Topbasoğlu | 2016 | Wedding meals in Turkish and Russian weddings |
| Büyüksalvarcı et al. | 2016 | Use of wedding meals in tourism |

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|------------------|------|---|
| | | businesses |
| Isık et al., | 2017 | Ilgın culinary culture daily and transitional dishes |
| Sezgin and Onur | 2017 | Erzincan wedding dishes |
| Kaya and Akpınar | 2017 | Turkish food culture and wedding meals in Kutadgu Bilig |
| Arıkan | 2018 | Wedding dinners in Ottoman palaces |
| Şahinbaş, K. | 2018 | Transitional food in Kayseri |
| Erol and Alashan | 2019 | Urgup special day meals |

Source; Compiled by the researcher.

In the studies, it is seen that wedding meals are examined among other food rituals, the dishes and traditions of each region are recorded and even these meals are evaluated in terms of health. In the literature, wedding meals for many provinces or districts have been examined and recorded. However, such a study has not been found in the literature for Muğla province. It is important that Muğla wedding meals and the traditions seen in weddings are recorded so that they always exist.

2. METHODOLOGY

Just like the differences from region to region, there are also differences from district to district in Muğla province. These differences differ from each other especially in the regions called Sakaraltı and Sakarüstü. The region called Sakarüstü includes Menteşe, Ula, Yatağan, Milas, Bodrum, which are located on the upper part of the Sakar region. In the region called Sakaraltı, there are districts such as Köyceğiz, Ortaca, Dalaman, Fethiye, Seydikemer. The study will also be able to reveal the differences in Sakaraltı and Sakarüstü regions. It is aimed to obtain in-depth information by using qualitative research as a research method. Observation and interview techniques were used to collect data. Observations were made by attending 5 weddings in Ortaca, Dalaman, Köyceğiz, Fethiye and Seki, and 3 weddings in Menteşe, Yatağan and Milas, and the photographs were recorded. In addition, interviews were conducted with 10 participants who voluntarily agreed to participate in the research by applying a semi-structured questionnaire.

While determining the participants, people who wanted to contribute voluntarily were included in the study. The universe of the research consists

of 10 people, who were born in Muğla and live in Muğla, especially those who are interested in wedding meals and perform it as a profession, women and gentlemen who are engaged in farming and working in a food factory. The interviews lasted 30-40 minutes. The data collection process was carried out at long intervals due to the bans on weddings during the pandemic period. Data were collected between July 2017 and July 2022. It is possible to complete the process and reach sufficient data at the point where the data falls into repetition and similar answers come. Repetition of the given information is more effective than the number of samples in order to obtain sufficient data or to have reached data saturation (Burmeister and Aitken, 2012; Kerlinger and Lee, 1999; Glaser and Straus, 1967). Data saturation was taken into account when determining the number of samples. Descriptive analysis method was preferred for data analysis. Descriptive analysis is a type of analysis in which the systematic description and explanation, interpretation and cause-effect relationship of the data are examined ((Yıldırım and Şimşek, 2016). In the interpretation of the data, interpretation was made both by taking the statements of the participants as they were and by coding. dinners and wedding guests. The coding of the themes created in the study is as follows. The first theme was determined as wedding rituals and the second theme was wedding meals. Wedding rituals was coded as rituals in the preparation phase, rituals in the welcoming phase, and rituals in the presentation phase. The theme of wedding meals was coded as the way of preparation, preparation times, differences compared to the past.

2.1. Findings From The Interviews

In the old days, preparations were started for wedding dinners a few days before and preparations were made for the meal by getting together and helping each other, but as we come today, wedding catering has become a profession. Demographic characteristics of the participants are given in Table 2.

Table 2. Demographic characteristics of the participants

| Particip ant | Age | Gender | Place |
|-------------------------|------------|---------------|--------------|
| P1 | 53 | male | Menteşe |
| P2 | 48 | male | Köyceğiz |
| P3 | 32 | male | Yatağan |
| P4 | 57 | female | Dalaman |
| P5 | 43 | male | Ortaca |
| P6 | 44 | female | Fethiye |
| P7 | 26 | female | Milas |
| P8 | 51 | | Seydikemer |

In the culture of the region called Muğla, Sakaraltı, there are the following dishes in wedding meals; The dessert can be different. The serving along with a pancake, meat with chickpeas, rice, dried beans, seasonal salad, sour chicken soup, yoghurt. One of the desserts such as homemade baklava, zerde, halva and lokma is preferred as dessert. Wedding meals will be ready around noon. In another area, tea samovar is burned, tea is brewed and made ready for tea service. The drum and zurna team, wedding owners, cooks and punchers (women singing with a kind of percussive instrument) wait for the guests to arrive. The drums and horns begin to play with each guest (Picture 1).



Picture 1. Welcome with drum and zurna team

Hearing the sound of the drums, the wedding owners welcome the guests. It is played to the accompaniment of drums and zurna with the guests. Guests tip the optional team. After the welcoming ceremony, the guests are taken to their tables (Picture 2).



Picture 2. Wedding venue and guests

There is another ceremony called opening a keskek to start the food service. For this, a bunch of wild flowers collected from nature is placed on a keskek covered with a red cloth. The participant, whom we asked what these flowers mean, said, *“The daughter is the flower of her father. For this reason, the girl takes these flowers on her father's keskek and gives the money that she wanted to be given to the cooks. He lifts the veil over. The father plays the first game of the wedding in front of the keskek, accompanied by drums and zurna.”*(Picture 3). It was stated that in the 1st and 7th Sakarüstü region of the participant, the groom shaved before the ceremony of receiving the bride



Picture 3. Opening a veiled keskek

In the interviews held to obtain the findings with the preparation and recipes of the wedding meals, it was learned that the preparation and initial stages were the same, but some dishes might not be available depending on the preferences of the wedding owners and the season. The preparatory stage, which was expressed jointly in the interviews with the participants 2, 4, 5, 6, 8, *“We arrive at the wedding place very early in the morning. Participant 7 added a kind of ravioli, Vekilharç, to their wedding meal. We start the day by setting up a wood-fired stove. We burn the wood fire and put it on the tripods (metal apparatus used as a pot base on the fire). First, we put the products that will cook late in the pots. We prepare several stoves. We start cooking keskek in one, chick, meat in one, beans in one, and chicken in another.”* (Picture 4). Participants 1, 3 and 7 stated that they made Lokum pilaf and sour meatballs in addition to the meals. Other preparations are made until the products on the stove are cooked and softened. Processes such as chopping the cucumber ingredients, crushing the garlic, chopping the vegetables for frying and yoghurt are carried out in this interval, and meal preparations are continued. The bride, dressed in a bindallı, takes care of her guests. It is made for the bride and groom to mix keskek so that the wedding will be fruitful and sweet.



Picture 4. Food is cooked in wood fire

After the ceremony about the completion of the meals and the start of the wedding, the distribution of the meals begins. Meals are portioned into metal plate used locally for distribution. These plates, which were copper in the previous periods, have been replaced by metal plates. Recently, especially after the pandemic, disposable plates or table d'hote are preferred. Meals are placed on trays, one plate for each. A plate of all kinds of food is served on clean papers laid out on the tables (Picture 5). It is brought back from the finished meals upon request. Spoons, bread and water are also left on the tables with the meal.



Picture 5. 6. Distribution of meals

During the meal, the "delbek", which is part of the wedding tradition in the Sakaraltı region, is played. Delbek is a kind of tambourine. It is made of Capricorn leather and needs to be heated before playing. Women play the delbek and sing their songs along with it. Women who play and sing the delbek are called "delbekci" in the local (Picture 6). After eating, the guests drink their tea. New guests are taken to the tables where the plates on the table are removed and new paper covers are laid. This process continues until the evening hours. If the wedding will continue in the same area, the food service will continue throughout the night along with the entertainment. If a venue is chosen for the wedding, the food service is completed and the night is completed with entertainment. The evening entertainment in Muğla locality is called "prom".



Picture 7. Delbek women play the delbek and sing folk songs

In the recipes obtained after the interviews, since the amount varies according to the number of people, it is described with technique instead of full measure. The recipes are as follows;

Keşkek;

Wheat is softened by placing it in water. When it is well saturated with water and cracked, butter is added. The butter melts in the water without burning it, sweetening the keskek. Cooking is continued by stirring and crushing continuously. The second butter is melted and foamed and added to

the keskek. Thus, the taste and aroma of the melted butter are added to the keskek. When it is fully helmed, it is thoroughly crushed and made ready for service. Finally, the butter is burned with tomato paste or pepper and served it.

Meat with chickpeas;

Chickpeas are soaked in water the night before. It is filtered and cooked in fresh water. Chopped meats are cooked in a separate cauldron. Onions are cooked in olive oil. Tomato paste and powdered pepper are added, combined with the meat, and frying is continued. Boiled and drained chickpeas are added together with enough water to cover them and cooking is continued until they are completely cooked and congealed. If desired, pepper can be put in it.

Yoğurtlama;

Potatoes are cut and fried in oil and wood fire. Peasant peppers are sorted and finely chopped and fried. Garlic is crushed. When it is to be served, yoghurt, salt and garlic are whisked well and poured over the fries. On the yoghurt, "takrak biber" (dried red pepper) and ground pepper are burned and served by pouring.

Sour chicken soup;

Village chickens are boiled. The white flesh separated from its bones and skin is shredded and divided into small pieces. Tomato paste and ground pepper are burned in oil in the boiler. Add chicken broth and salt and mix. When it boils, add rice and cook until soft. After adding chicken pieces and boiling for a little more, garlic and lemon juice are added, optionally chopped parsley or mint, mixed and served it.

Rice pilaf;

the rise is roasted with butter and olive oil. Chicken broth is added and salt is given. It is cooked by pulling. Pilaf can be made plain or with chickpeas.

Salad;

It is made in the form of mixed salad or tomato salad with seasonal ingredients such as lettuce, cabbage, and carrots.

Bean;

Dry beans are boiled beforehand or soaked in water and poured into the water. Onion and olive oil are sautéed in the cauldron. Roast is continued with tomato paste, red pepper and ground pepper. Dried beans, water and salt are added and cooked until they become soft and congealed.

Semolina dessert;

Peanuts are roasted in olive oil. Add semolina into it and fry by stirring constantly. When its color turns completely and its smell comes out, it is extracted by adding a measured sugar and water mixture or sugar milk mixture. It is rested by closing the lid. It is mixed and ready to be served.

Lokma;

The dough is kneaded with flour, yeast, water and very little salt. While it is waiting for fermentation, its syrup is prepared with sugar, water and lemon and cooled. The fermented dough is taken into the palm of the hand and squeezed, and the overflowing dough is taken with a greased spoon and thrown into the semi-heated oil. After frying on all sides, it is drained and poured into sherbet. It is kept for a very short time and taken from the syrup. Served with cinnamon sprinkled on top. (Recently, more production is done with machines).

Zerde;

Rice is boiled with measured water. After it has softened well, sugar, starch and a little water are added by crushing it. Clove or musk flower leaves are added and boiled a few times and poured into bowls.

Baklava;

Baklava dough is kneaded with flour, egg and milk. Walnut and sesame seeds are crushed and mixed as interior material. The syrup is boiled with sugar, water and lemon juice. The dough is opened and the walnut and sesame is sprinkled between each layer of dough. After all the phyllo dough is laid, it is cut and lubricated with olive oil. A mixture of olive oil and butter can also be made. It is baked and cold syrup is poured on the hot dessert. It is left overnight to absorb the syrup.

Eksili köfte;

Meatballs are kneaded with minced meat, onions, spices and flour. It is rolled to the size of nuts and fried in oil. Onions are sautéed and colored with tomato paste. Boiled chickpeas and water are added and boiled. After boiling, the meatballs are added. Cooking is completed by adding lemon juice.

Vekilharç;

Vekilharç is a kind of ravioli. It is kneaded with flour, water and salt. For the stuffing, minced meat and onions are roasted with spices. The dough opens. It is sprinkled on the mortar made with meat and onions and rolled. It is cut, placed on a tray and baked. The broth is poured over it and softened. When the ravioli becomes soft, yogurt with garlic is poured. Finally, the chili pepper is burned in olive oil and drizzled over it.

When asked where the weddings are held, participant 3 said, *“Wedding dinners are held in the garden if our garden is sufficient. If our garden is not large, it is done in the market place or wedding areas.”* while participant 8 replied, *“It is done in gardens or school gardens. It can be gathered after the meal and held at the balo in the same place. But today's young people may want a wedding venue or an indoor hall for the ball instead of a village wedding.”* To the question of when the weddings are held, all the participants stated that the weddings are held especially in the summer period, and in the winter, they are held on sunny days, except for the 3-month period, which is rainy and cold due to the climate structure.

The 2nd participant in the question of when and how the wedding preparations are made said, *“Wedding preparations start long before. But especially in recent weeks it is very tight. There is wedding invitation distribution. Although invitations are distributed today, there are still those who apply old customs. We call the wedding invitation “oku”. The person invited are given baklava, socks and fabric in small trays. Some are given gifts and some baklava. This means the sweetness of the mouth. It is also to show that you value it by giving gifts. Guests coming to the wedding come with money, gold or gifts. The things that the guests bring are called oku.”* replied.

When asked about the wedding meals, participant 8 said, *“These meals have been cooked for a long time. But now the possibilities are better. People can both buy it, and even if they don't have it, they can find it. Previously, everyone produced and cooked their own, so whatever was available was made with it. For*

example, pasta dessert was made before. To make baklava, you need both materials and time to make that much baklava. They used to cut the dough, pour walnuts on it and make sherbet. We still do it occasionally, but it's not done at weddings anymore." he said. Participant 6, on the other hand, talked about opportunity and economy and said, "People used to cook with whatever they had before. If it's rich, it's made with meat. If there was no money, a pilaf was made with karagöz (dry cowpea) and burgul (bulgur), which is common in every house. Next to it, compote and a little yoghurt were placed. They all have it at home anyway". Regarding Zerde, it was stated that it was made more often before, that it was definitely scented with cloves while it was being made, and it was eaten by covering it with rice pilaf. When asked about meat with chickpeas, the participants who said that chickpea is used in many dishes and is used a lot in making meat, stated that it is called meat with chickpeas because the meat is more than chickpeas. Participant 4 said, "If we cook watery food in a pot, we say stew. In fact, we say meat with chickpea, not chickpea with meat."

When we asked if there were foreigners at the wedding, it was stated that there were many foreigners at the wedding. It was stated that the reason for this was that the guests were accepted as guests since the wedding meals were served in the open, and it was believed that the more people the food was served, the more beneficial it would be. Participant 5 said, "Since our weddings are local and natural, they attract the attention of tourists in the vicinity. When they come, we invite them and offer them the food we have prepared. They like it a lot." He emphasized culture.

3. CONCLUSION AND DISCUSSION

Weddings held in Muğla maintain their traditions and customs to a large extent. There are changes in the past and present with the development of technology and economy. In the past, all the ladies came together to prepare dinner together, but today, wedding catering has become a profession. Since the wedding caterers bring all their vehicles as a team and bring their own vehicles, it provides a serious convenience to the wedding owner. In addition, especially because they make wedding meals and in large quantities, the result is always consistent and delicious meals with experience and hand habits. For this reason, getting together, imece, has become obsolete. Although this situation reduces the workload of the wedding owners and gives positive results in terms of the taste of the food, in fact, a traditional culture

has started to make people forget the imece in wedding meals. However, the sustainability of other rituals could be continued thanks to the reduction of the workload of these wedding caterers. Other rituals include opening a keskek, welcoming with drums and zurna, food offerings, wedding meals, playing the delbek or drumzurna during the meal, mixing the keskek with the bride and groom.

Weddings are held especially during the summer months. However, due to its climate, it has been observed that it is also done in winter periods when there are suitable weather conditions. It is mostly done outdoors, in gardens, market places, school gardens or citrus orchards. In the Sakarüstü region, keskek is made with meat or chicken. It can be said that in the weddings held in the open air and in a warm climate in the Sakaraltı region, in order not to harm human health, the keskek is made without meat or chicken and is flavored only with three different combinations of butter. For the same reason, sour chicken soup is mostly made in cooler weather. This explains the differences in the meals and the absence of some dishes. Although chicken meat is not preferred much, there is definitely a meat dish. In Muğla weddings, especially meat with chickpeas performs this custom. Presentation of one type of meat dish and more than one dish is in line with the results of Demir and Topbaşoğlu's (2016) study.

Weddings attract the attention of both local guests and foreign tourists. With the hospitality of the local people, hosting local and foreign tourists in the region, serving their meals and accompanying them to the wedding increase the satisfaction of the tourists. At this point, tourism can be diversified by preparing concept events such as sira night, yaren meeting, henna night, which are organized in many places in our country. This will cause local people to become more attached to their culture. In addition, it will be possible to contribute to local development. The presentation of wedding meals within the wedding concept will also enable the recognition of the dishes (Büyüksalvarcı et al., 2016, Sabbağ and Boğan, 2019) that are not included in the touristic business menus. In another study, wedding meals consisting of rice, meat and zerde were presented to the public at Ottoman palace weddings. These meals were called “public feast” (Arıkan, 2108). It can be said that it still exists in Ottoman culture due to elements such as pilaf, meat and zerde, and serving.

Muğla attracts the attention of tourists due to its rich history and nature. However, there is seasonal tourism. It is one of the rare places where cultural tourism can be done due to the sufficient infrastructure, being a well-known place, and having many historical and natural beauties. By taking advantage of these features, weddings and wedding meals can be used to spread tourism throughout the year. As a matter of fact, Muğla Wedding Food Festival, which was held for the first time, attracted a lot of attention at this year. By developing this form of tourism, gastro tourism can be suggested for Muğla and its districts. Quan and Wang (2004), in their research; They put forward the view that food festivals (carnivals) and gastronomic tourism can serve as a source of identity for tourism destinations. Therefore, destination marketing organizations support gastronomy as a brand image in tourism in order to gain a number of competitive advantages by using their own resources and capabilities, to develop a gastronomic tourism strategy and to draw attention to gastronomy tourism (Telfer 2000; Tellström et al. 2006). These statements are consistent with the results of our study.

It is recommended to make a comprehensive research for all districts of Muğla province and to examine wedding dishes and their differences from each other in order to recognize and maintain the culinary culture. Recording and photographing dishes and traditions will create an opportunity for future generations to recognize their origins and protect their cultural values. For this reason, it is recommended that the relevant institutions and organizations come together and carry out protection and recording activities in cooperation.

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CHAPTER 8

**THE ESTABLISHMENT OF COMINTERN AND THE
IDEOLOGICAL FOUNDATIONS OF THE BOLSHEVIK
SUPPORT FOR ANATOLIA THROUGHOUT TURKISH
NATIONAL STRUGGLE**

Assoc. Prof. Nuri KARAKAŞ¹ & PhD Student Gulamhuseyn
MAMMADOV²

¹ Ege University, Faculty of Humanities and Letters, Department of History, İzmir/Türkiye. E-mail: nurikarakas16@gmail.com ORCID: 0000-0002-2359-8944

² Ege University, Graduate School of Social Sciences, İzmir/Türkiye. E-mail: qulam.memmed12@gmail.com ORCID: 0000-0001-8109-5619

INTRODUCTION

Tsarist Russia's expansionist policy and its imperial passions have led the country to the war, which had been already suffering due to political, social and financial terms. Within this period, while the Tsarist regime could not bear the burden of the war, instability in the country triggered the process leading to the revolution. Monarchy was overthrown in February 1917 (with new calendar in March) in view of various ideological movements³ endeavours nurturing from the fiscal concerns during the war which got stronger steadily in Russian Empire since the beginning of the century (Kurat, 2014: 457). However, in the same period, the provisional government established replacing monarchy was built on weak foundations. It was subverted by the Bolsheviks in November seventh in 1917 (with new calendar), due to getting weaker in the wake of June Offensive⁴, resulting in casualties of approximately 500.000 people, and after July Days⁵, exacerbating political concerns.

As it may be signified that, the Bolsheviks' precise statements related to withdrawing from the war⁶ and the disappearance of the Eastern Front against the German Empire ensued the relations with Entente powers to deteriorate. Apart from this, together with Treaty of Brest-Litovsk, the ghost of German domination in Eastern Europe was on the verge of becoming reality, and the Allies started to earnestly consider military intervention (Gaworek, 2013: 608). After the Bolsheviks reluctantly signed the treaty of Brest-Litovsk with the Central Powers⁷, first Allied forces were landed in the

³Although these ideological movements that emerge during the revolution were actually called left and right movements, the dominant group consisted of the left movements. However, these left movements were divided among themselves into different ideological fronts. See also: (Гейфман, 1997).

⁴June offensive or Kerenski offensive is an attack carried out by Russia in July 1917 with new calendar. This last offensive by Russia against the German Empire and the Austria-Hungarian Empire was decided by the Minister of War Aleksandr Kerensky and conducted by Aleksey Brusilov. At the end of the offensive, the Russian armies suffered a heavy defeat. See also: (Кавтарадзе, 1967).

⁵It is a general nomenclature for events that occur throughout July third to seventh in 1917. Workers and some soldiers started to protest against the administration and army units affiliated to the Provisional Government opened fire and dispersed the demonstrators. During the events, the leader of the Bolsheviks, Lenin, took shelter in underground and many Bolshevik leaders were arrested. See also: (Steinberg, 2017: 75).

⁶The first serious public opposition to the Provisional Government was its decision to continue the war. See also: (Carr, 1985: 90).

⁷One of the most opposed to this treaty in Saint Petersburg was Trotsky. He thought it was imperative just to declare the end of the war and mobilization without signing any peace treaty with the imperialists. On the other hand, Lenin stated that if the treaty was not signed then, a heavier treaty would be made in the future, so he supported the signing of the treaty

northern lands of Russia. This tense environment conduced to armed clashes with new Russia after a while. Thus, even though the allied force's interventions ended in 1922, it took until 1925 for these conflicts to come to an end⁸.

While the process of revolution was perpetuating in Russia, the Ottoman State signed the Armistice of Mudros seized with emperialism on 30th October 1918, and it left the war suffering heavy losses. When we consider the demands of some local nations like the Armenians and the Rums (Greek Orthodox Christians) together with the violations of Entente Powers in carrying out the terms of the armistice, we can tell that both the Ottoman State's future and the presence of Turks in Anatolia were obscure. As a matter of fact, since Armenian question was frequently brought forward in this period⁹ and the terms of the armistice were breached by Entente Powers, it concluded with a national movement against occupations in the hinterland of Anatolia.

Anatolia, comprising mostly the center of Ottoman territory, would strive to maintain its existence between imperialism and Bolshevism within this process. Bolshevik Russia, being established following the collapse of Czarism due to the revolution, would develop policies regarding to converting the state to communism, which had been newly found in Anatolia. Hence, the stance of the leaders of the Turkish National Struggle in Anatolia would make the relations between two parties (Turkish Nationalists and the Bolsheviks) intresting in the face of these policies during this period. National government based in Ankara, having to struggle against emperialist states after World War I as a result of this case, and Bolshevik Russia would promote a cooperative relationship by virtue of their conditions, and they would implement a new policy. This policy was being shaped on an apparently friendly but cautious and self-interested line. Actually, this situation for Turkey was based on the principle of providing Soviet support in terms of financial and military aid in foreign policy, and preventing all kinds of ideological attempts of the Soviets in domestic politics.

The situation of the two states, which had been fighting various wars for nearly 300 years and took part in different alliances in the First World

immediately. Nikolay Bukharin and Karl Radek, who were among the Left communists in this process, believed that the German Empire, the Ottoman State and Austria-Hungarian Empire were on the eve of revolution, and therefore they opposed a peace treaty with them. See also: Ruth (Fischer, 1982: 35-40).

⁸ See also for the study related to this subject: (Kinvig, 2006).

⁹See also for more information: (Özçelik, 2017: 655-682).

War, was similar and both would form a union of forces against the Entente Powers. While the Bolsheviks managed to take over the government in Russia¹⁰, it must be marked that the situation in Anatolia was different from that. Because Turkish nationalists in Anatolia were fighting against the Entente Powers outside and the Istanbul Government, which displayed a capitulating manner at home. Nationalists in Anatolia were aware of the fact that it was necessary for them to provide support from a foreign state in order to fight against their rivals. The issues such as how to maintain the national struggle under the conditions of that period, and on which resources and means to base it, debated in detail at Amasya convention on June 19th 1919. One of the solutions taken into consideration was whether Russia's new stance, particularly after the revolution, would be benefitted from or not (Sonyel, 1987: 84).

In this regard, we can assume that the Bolsheviks comprehended their advantage in the triumph of the nationalists in Anatolia. Because according to them, it would give them an opportunity to gain Islamic world by implementing their own bolshevikization plans, and it would prevent the Entente powers from blockading Russia by creating an active buffer zone on the southern borders of revolutionary Soviet Russia (Sonyel, 1987: 83). Furthermore, the alliance with Anatolia had another significance for Russia: Turkey was the only country in Asia Minor that could meet Soviet's criteria. Turkey, which had been in contact with the West for a century and a half, had carried the flag of Islam for centuries, had a high reputation among all Muslims. It also had never lost its independence and was then fighting for its independence (Okyar, 1998: 43).

On the other hand, we had better consider the fact that aiding Muslim and Turkish Anatolia would conduce to increase Bolsheviks' reputation in the past Russian Empire's Turkic Muslim community. Bolshevik Russia has many benefits with the national movement in Anatolia in terms of a real political point of view. There have been many studies regarding the formation of cooperation between the two forces, the implementation of policies and their results in the current literature. While the bilateral relations have been scrutinized mostly with respect to the real politics, the ideological doctrine, shaping the Soviet's approach, hasn't been efficiently contextualized within

¹⁰ The Bolsheviks, who came to power in Russia after the October Revolution of 1917, did not rule all the territory of the Russian Empire. The lands of past Czarism were ruled either by rival leftist groups or by local population. See also for more information on Russian civil war: (Bullock, 2008).

these studies. However, from the Bolshevik's aspect, providing financial and military support to movements led by people who were not communist until that time, and even whose closeness to other left movements were unknown, actually means opposing the doctrine expressed in the essence of the revolution. While Bolshevik Russia, like other states, complied with real politics in the matters related to the foreign policy, it would also soften its politics and bring a new perspective to the concept of "World Revolution" in order not to have problems with the radical approaches fueled by the revolution that took place a short time ago. Together with the altering policy, Bolshevik government would acknowledge different methods with regards to their approach to "the national and colonial question", the proposed program would be reinterpreted, and many issues would even be reconsidered in line with these interpretations.

After giving a brief information on leftist movements and their goals following the implementation of the Communist International (Comintern), the doctrinal changes in Bolshevik Russia, namely the steps of the Soviets to legitimize support for non-communist Turkish nationalists, shall be discussed in line with the progress of Turkish-Russian relations. In addition, it shall be tried to indicate that Bolshevik leader Vladimir Lenin's efforts in the Comintern played an important role in the doctrinal changes implemented in terms of Bolshevik aids to Turkey.

1. The Ideological Leftist Movements and the War

In the 19th century, two internationals had been established to coordinate leftist movements around the world. International Workingmen's Association, established in 1864, also known as First International, had been divided into two groups in 1872, following a fierce struggle broken out between statist and anarchists, and it had dissolved itself in 1876¹¹. The first World War had broken out while the working period of the Second International, established in 1889. Although Second International convened to protest against war and held discussions during the days of July Crisis¹², it avoided any distinctive action. On August 4, 1914, French and German

¹¹See also: Интернационал 1-й, Большая российская энциклопедия, link: https://bigenc.ru/world_history/text/2014543 (the date of access: On March third, 2022)

¹² It was a series of interrelated diplomatic and military crises that became the ultimate cause of World War I among the great powers of Europe in the summer of 1914. The crisis began with the assassination of Archduke Franz Ferdinand, heir to the Austro-Hungarian throne. A Bosnian Serb Gavrilo Princip who assassinated Archduke Franz Ferdinand on 28 June 1914. See also for the details: (Beatty, 2012).

socialist deputies unanimously advocated emergent war appropriations in their parliaments (Craig, 1989: 20-21).

Efforts to promote international socialist action for peace culminated at the Zimmerwald Conference of the Second International on September 5-8, 1915 (Craig, 1989: 66). Zimmerwald Manifesto, adopted at the end of the conference, depicts the majority of centrist elements¹³, and it ended with the call for a stronger international, terminating all wars and capitalism. The question of the new international, which was frequently brought to the agenda at the Zimmerwald Conference, became closely related to the stances of the socialists towards the war. The Right¹⁴, supporting the policy of national war, was still believing in the Second International, and was anticipating it to revive after the war. Yet the extreme Left¹⁵, consisting of Lenin's followers, were looking forward to forming the new International to take its place in the wake of the war. Centrists were between the two extreme ends of the political spectrum, and they desired reformed or reconstituted Second International, instead of a completely new organization (Carr, 1966: 562). The conference brought about the emergence of a strong revolutionary left. "The hitherto unknown name of Zimmerwald was echoed throughout the world" said Lev Trocki afterwards¹⁶. Final meetings were held on April 24-30, 1916 in

¹³ Centristism is the name given to the supporters of thought in Marxism who are between revolutionism and reformism. For the famous Bolshevik Leon Trotsky's thoughts on the subject, see: Leon Trotsky, "Two Articles On Centristism", link: <https://www.marxists.org/archive/trotsky/1934/02/centristism.htm> (Date of access: On March 6, 2022)

¹⁴ The group, also called reformist socialists, is known as a supporter of democratic socialism or social democracy. They reject social revolution and radical changes in principle and believe that problems can be resolved through reform. See for more information: (Gorz, 1987: 100-117).

¹⁵ The group, also called Revolutionary Socialists, are adherents of the political philosophical doctrine that considers social revolution important within socialism to bring structural changes to public opinion. See also: Rosa Luxemburg, "Reform or Revolution", link: <https://www.marxists.org/archive/luxemburg/1900/reform-revolution/intro.htm> (date of access: On March 8, 2022)

¹⁶ Alan Woods, "The Zimmerwald Conference - the turning of the tide", link: <https://www.marxist.com/the-zimmerwald-conference-the-turning-of-the-tide.htm> (date of access: On March 17, 2022)

Kienthal, Switzerland¹⁷, and on September 5-12, 1917 in Stockholm, Sweden¹⁸.

It is obvious that the movement, known as Zimmerwald Left, paved the way for the emergence of the Third International, so-called Comintern, by causing division between the Second International's reformist socialists and revolutionary socialists, or aggravating the present rift among them.

2. Foundation of the Comintern (Communist International)

By the time the monarchy was overthrown during February Revolution in 1917, Vladimir Lenin was not living in Russia¹⁹. Coming to Russia in April 1917, he stated that the Russian Revolution was approaching the second phase, namely the proletarian stage, in a program titled "April Theses" which he published. In this program, he also declared that the provisional government shouldn't be supported, and their goal was to establish a commune state, which would model the example of Paris Commune and base upon revolutionary councils (soviets). His statements were espoused like the Bolsheviks' party doctrine after a while (Lenin, 1975: 295)²⁰. He defined the provisional government as bourgeoisie government in April Theses, and he emphasized that it never should be advocated. He delineated the First World War as follows: The war was broken out to split the colonies and the plunder of foreign lands. Identifying all thieves' interests with the one nation's interest and attributing it to one of the Thieves' defeats at a given moment is an unscrupulous bourgeois lie. He also pointed out that the state ought not to be a parliamentary republic, yet a republic of Soviets of Workers, Agricultural Labourers and Peasants' Deputies throughout the country, from top to bottom. Because according to him, establishing a parliamentary republic after soviets of workers' deputies would be a step backwards (Lenin, 2007: 10-11; Fischer, 1964: 85)²¹.

¹⁷ See for more information on Lenin's opinions related to the conference: V. I. Lenin, The Second International Socialist Conference at Kienthal, link: <https://www.marxists.org/archive/lenin/works/1916/apr/17.htm#fwV41E491> (date of access: On March 17, 2022)

¹⁸ Conferences of leftist movements supporting the Central Powers were held in April 1915, those of the Entente supporters in August, February and September of 1918, and conferences of neutral socialists in July 1916. See also: (Gankin and Fisher, 1940: 273-274, 284).

¹⁹ Lenin left Russia in 1900 and lived in European states. He was in Switzerland during the February revolution. For more information see: (Service, 2000: 130-135, 254-255).

²⁰ For more information regarding "April Thesis" see: (Lenin, 2007: 10-14).

²¹ See also: Vladimir Ilyich Lenin, "The Tasks of the Proletariat in the Present Revolution, (The April Theses)", link: <https://www.marxists.org/archive/lenin/works/1917/apr/04.htm> (Date of access: On March 19, 2022)

Lenin touched upon the concept of “revolutionary defeatism” in April Theses, just like he had been doing since the beginning of the war. Hence, he put forward the notion of “revolutionary defeatism” against “revolutionary defensism” and “Socialist patriotism”²² again²³. According to him, workers would procure more from their own nations’ defeats if the war could be turned into civil war and international revolution afterwards (Appignanesi et al, 1977: 118)²⁴. He said in response to the socialists supporting their own states in the Second International as the war had just begun: “The Second International is dead... long live the Third International”²⁵, and also wanted the new international to convene by saying: “We are bound to initiate to form a revolutionary International, an International against the social-chauvinists and against the Centre”²⁶.

The successful realization of the October Revolution in 1917 meant, according to Lenin, that the working class in Russia had fulfilled its duty by accomplishing the evolution of class consciousness, and the workers of Europe would follow them. The Comintern (the Third International or Communist International) was created by a congress consisting of revolutionaries in Moscow in March 1919. The most significant difference that distinguished the Comintern from other internationals was to establish a world party of communists aiming to transform capitalist private ownership into collective ownership and production through armed struggle (McDermott and Agnew, 1996: xix).

As a matter of fact, until 1920, namely at the time when the Comintern was founded, Lenin opined that a revolution would soon take place in Western Europe and connected his policy to this (Okyar, 1998: 39). The incidents, occurred in the wake of World War I in Europe, also were

²² For more information concerning “Socialist Patriotism” see also: (Jones, 1990: 132-135). Lenin sometimes called this group as “Social chauvinism”. See: Vladimir Lenin, “On the Struggle Against Social-Chauvinism”, link: <https://www.marxists.org/archive/lenin/works/1915/jun/01.htm> (Date of Access: On March 26, 2022)

²³ Vladimir Lenin, “April Theses, The Tasks of the Proletariat in the Present Revolution, April 17, 1917”, Michigan State University, link: <https://soviethistory.msu.edu/1917-2/april-crisis/april-crisis-texts/april-thesis/> (Date of Access: On April 4, 2022)

²⁴ See also: (Lenin, 2007: 33-34).

²⁵ Rob Sewell, “4th August 1914: The Great Betrayal and Collapse of the Second International”, link: <https://www.marxist.com/4th-august-1914-the-great-betrayal-and-collapse-of-the-second-international.htm> (Date of Access: On April 15, 2022)

²⁶ Советская историческая энциклопедия, АПРЕЛЬСКИЕ ТЕЗИСЫ В. И. ЛЕНИНА, link: <https://rus-sov-istoria-enc.slovaronline.com/2185> (Date of Access: On April 15, 2022)

nourishing aforementioned expectations of Lenin and his friends²⁷. Implicitly, however, the Russian Bolsheviks believed that their salvation also hinged on the European revolution (Carr, 1966: 200). Thus, we can point out the fact that Lenin regarded the Comintern as a tool both to spread the revolution by utilizing the existing productive conditions and to hinder the destruction of the Bolshevik revolution in Russia before it was fully stabilized.

The invitation letter for the First Congress of the Comintern, prepared by Lenin, Trotsky and 7 other revolutionaries living in Moscow, on January 24, 1919, comprised three parts: “goals and tactics”, “relations with socialist parties” and “the question of organization and the party’s name”. In the first part, it was stated that the destruction of capitalism was the stage of the collapse of humanity and that if capitalism and its contradictions were not ruled out, it would result in the collapse of all European civilization. It was also signified that, the duty of the proletariat now is to take over the state power immediately. It refers to repeal bourgeois state apparatus and creating a new apparatus of proletarian power. In addition, the proletarian state that was planned to be established was described as follows: “Not a false, bourgeois democracy -that hypocritical form of rule by the financial oligarchy- with its merely official equality, but a proletarian democracy, which can realize freedom for the laboring masses; not parliamentarism but self-administration of these masses through their elected bodies; not capitalist bureaucracy but executive bodies formed by the masses themselves with their actual partaking of governing the country and of socialist constitution. Such must be the form of the proletarian state. Its absolute embodiment is the power of the soviets”. In the second part, the socialist ideological movements, having been stated above, were being criticized. In the third part, it was announced that the Comintern was the Third International, and it was mentioned that organizations, merged on the same platform and under the same tactics, could form a union (McDermott and Agnew, 1996: 220-223; Sobolev, 1979: 59-73).

²⁷ So much so that the communists took over the administration in Russia, one of the biggest states in Europe, the monarchy was abolished in Germany in November 1918, the second Soviet Republic of the world was established in Hungary following Bolshevik Russia, and a treaty was signed with the socialists who supported the civil war in Finland. For more information see: (Hoffrogge, 2015: 61-79). On March 21, 1919, Béla Kun, one of the rulers of Soviet Hungary, informed Lenin on the foundation of the proletarian dictatorship in Hungary. Lenin asked the administration to remove the social democrats in his reply on March 23, but declined Kun’s offer of alliance while grappling with the Russian civil war. See: (Rees, 1998: 254-255). Although the "Red Treaty" between Soviet Finland and Soviet Russia was signed in March 1918, It was not possible to put the cooperation into practice. See: (Alapuro, 1988).

After a two-week delay, the First Congress of the Comintern, in other words, “the alliance of the workers of the whole world aiming to establish Soviet rule in all countries”, according to Lenin’s version, convened in Moscow on March 2, 1919²⁸. Although 35 of the more than 50 representatives who attended the first meeting of the Comintern in Moscow represented different communist parties and groups from 19 countries of the world, only 9 of them came from foreign countries; others were living in Russia. These representatives were recognized as full delegates with suffrage franchise. The others were represented at advisory level at the congress (Carr, 1966: 127; McDermott and Agnew, 1996: 12)²⁹.

At the last meeting of the First Congress of the Comintern, that is, on March 6, “the manifesto to the Proletariat of all countries” was adopted (Weber, 1979: 4). In the manifesto written by Trotsky, it was stressed that they were the successors of the First International founded by Karl Marx and Friedrich Engels, that it was compulsory to struggle with opportunism and social patriotism, and that they would put all of their efforts in expediting the victory of the world proletariat in the world revolution. Just like the previous speeches, it was specified that it was mandatory to organize Socialist workers and Soldiers Soviets everywhere again, and it was reaffirmed that the Comintern was to overthrow the existing system all over the world in order to establish the socialist system in its place (Riddell, 1987: 222-233; Weber, 1979: 4)³⁰.

²⁸ Vladimir Lenin, III КОММУНИСТИЧЕСКИЙ ИНТЕРНАЦИОНАЛ, link: <https://leninism.su/works/77-tom-38/1310-rechi-zapisannye-na-grammofonnyx-plastinkax-38.html> (Date of Access: On April 20, 2022)

²⁹ Mustafa Suphi, as the representative of the Central Bureau of the Communist Organizations of the Eastern Peoples, also attended this congress. For Mustafa Suphi’s speech related to the situation in Turkey, see: (Weber, 1979: 16-19).

³⁰ Manifesto was signed by C. Rakovsky, V. Lenin, G. Zinoviev, L. Trotsky, and F. Platten. See: To the Proletariat of All Countries, link: <https://www.marxists.org/archive/trotsky/1919/03/manifesto.html> (Date of Access: On March 24, 2022)

3. Revolution in Europe

Despite numerous Bolshevik opposition to the signing of the Treaty of Brest-Litovsk, Lenin managed to persuade the opposition, arguing that the survival of the Soviet state depended on the “breathing space” provided by peace. Lenin predicted that the precise date of revolution abroad was incalculable; “We can’t jeopardize everything for that,” he warned. The outbreak of war with Poland in May 1920, the reescalation of the conflict in the south against white forces controlled by Wrangel, recreated the plight of 1919 on a smaller scale. The Red Army was stronger but the country was worn-out. The menace of 1920 appeared barely grimmer than in the previous year. The rapprochement, newly initiating with the west, had been ceased without being able to make any progress in the first months of 1920. After that, revolutionary propaganda, which formed the basis of Bolshevik foreign policy, took the place of diplomatic contacts. Although in 1919 the propaganda of the Bolsheviks remained largely local, by 1920 the Comintern was capable of disseminating revolutionary propaganda on an international bases. The revolutionary propaganda now emanating from Moscow in 1920 was confident, more bombastic and more coherent than previous initiatives and gave the impression of a more organized force behind it. The summer and autumn of 1920 was the culmination of the Comintern’s worldwide prestige and its hopes of advancing the revolution. When Karl Radek came to Moscow from Germany and dealt with the international, the field of activity in Germany expanded further (McDermott and Agnew, 1996: 9; Carr, 1966: 170-171)³¹.

In fact, among the revolutionary movements that emerged in different parts of Europe after the World War I, it was only the revolution in Russia that was prosperous. Leadership was the natural reward for revolutionary accomplishment, and to the Russians they alone, had proven that they knew how to stage a successful revolution; that’s how victory was won in October 1917, and that’s how it was to be won in other places (Carr, 1966: 202).

The Bolsheviks made a great effort to impose the “21 conditions” for membership in the Comintern to other European left parties. Although the issue of the acceptance of 21 conditions was not mentioned in the First Congress of the Comintern, the setting of the terms was brought to the agenda at the Second Congress and was approved with the suffrage of all delegates against the two black balls. According to the terms prepared by Lenin, the

³¹For more information related to the activities of Karl Radek in Germany see: Карл Радек, Пят лет Коминтерна, Красная новь, 1924.

party must purge itself from other centrist and reformist groups to join the Comintern. Underground and armed organizations affiliated with the party had to be established, turnout must be ensured in the campaigns against the yellow international of Amsterdam and the trade unions, and thus all imperialist exploitation ought to be opposed, especially the ones which their own states were doing. Moreover, these parties must act pursuant to the principles of strict discipline in their work, advocate the fierce struggle of all Soviet states against the counter-revolution, and write their party program in accordance with these conditions. It was stated that those who believed in the world revolution should add the word communist next to their party's names in the decisions made, that they should abide by the resolutions of the Comintern, that they should definitely include its decisions in their own newspapers, and that it was behooved to convene his own party congress to negotiate all these matters. Those who did not accept these principles, which were listed one by one in the congress, and who spoke against it, must be deposed immediately. According to Robert Servis, these conditions arose from Lenin's need to impose the methods of the October Revolution of 1917 on socialist parties in Europe, including the two fundamental principles of predicating it upon dictatorship and terrorism (Ленин, 1981: 204-212; Weber, 1979: 28-34; Service, 2000: 465)³².

Bolshevik Russia had gained some victories in the war with Poland and managed to carry the war to areas undoubtedly considered Polish territory during the days of the Second Congress of the Comintern. The decision to march on Warsaw, made at a time when all hesitations were cast aside by an exhilarated belief in the imminence of the European revolution, gave the military operation an obvious revolutionary enthusiasm. When the German workers in Danzig went on strike instead of unloading ammunition for Poland, when the workers in England not only challenged to load such cargoes but also held the councils of action and threatened the British Prime Minister with revolution if aid was delivered to Poland, the Bolsheviks couldn't help believing that the communism conquered the minds and hearts of the workers. However, the Bolshevik army began to retreat as of August 16, 1920. In contradiction to the Bolshevik's anticipations, even the Polish Communist Party's invitation to strike all Polish workers did not work, yet the workers enlisted in the national army to protect Warsaw. Eventually the

³² See also: 21 условие приёма в Коммунистический Интернационал, <https://beobaxter.livejournal.com/634792.html> (Date of Access: On April 29, 2022).

Russian Bolsheviks were compelled to sign a treaty for unfavourable peace, as in the Treaty of Brest-Litovsk, and the war with Poland was ended. As it can be observed, it evinces that Lenin ignored the criticism regarding to signing a treaty with the imperialists. While the war with Poland initially was proceeding in accordance with Moscow's wishes, Lenin said, "Poland was the last bulwark against the Bolsheviks", Nevertheless, he was aware of the fact that combat effectiveness of the Red Army was not sufficient anymore, contrary to the popular presumption (Carr, 1966: 213-219)³³.

Therefore, the process of Bolshevikization of the socialist parties in Europe, or establishing other Bolshevik political organizations was expedited by separating the socialists who were inclined to Bolshevism, in order for the revolution to emerge in Europe soon. The prevailing impact of Bolshevism in Europe captured the governments, and the Bolshevik representatives decided to proceed negotiations with the left parties of Europe to resolve the disputes whether or not to join the Comintern. Bolshevik representatives, dispatched for this purpose, began their work in Germany, which was initially regarded as the key point of the revolution in Europe. The question if the Independent Social Democratic Party of Germany should become a member of the Comintern was debated at the Halle Conference in October 1920. The establishment of the United German Communist Party was officially declared after long disputes as a result of the unification of the Communist Party of Germany with the majority of the Independent Social Democratic Party of Germany. A similar process to this also was experienced in France, the French Socialist Party altered its name as French Communist Party. The existence of the French Socialist Party was perpetuated by those who did not accept this name change. The situation in Italy developed differently compared to the other European countries. Italian Socialist Party didn't accept one of the most important conditions of "21 conditions" to become a member of Comintern, that is, to eject the members thinking diversely. Giacinto Serrati rejected the relevant clause, by stating that it was contrary to the party's conventions and rules. Thus, a group under the presidency of Amedeo Bordiga broke away from the party, they declared the the Italian Communist Party was established. The negotiations in England witnessed a rather unsuccessful development in terms of the Bolsheviks. In conclusion, it was announced that the communist party was founded by the few members who broke away from other socialist

³³ See also: Советско-польская война // Большая российская энциклопедия, link: https://bigenc.ru/military_science/text/3589482 (Date of Access: On May 6, 2022)

parties. Communist parties were tried to be founded also in various other small countries of Europe. Yet generally it was seen that most socialists in small countries disacknowledged these terms. However, the Comintern, headquartered in Moscow, became a revolutionary organization with outposts in every European state (Carr, 1966: 220-231).

While these incidents were taking place in Europe, Lenin started to monitor the Third World more actively towards the end of 1919, and he began to think of opening an new front against emperialists in Asia (Okyar, 1998: 40). As a matter of fact, we will see in the following part of our study that before the groups in Europe were organized, the Bolsheviks had proceeded the arrangements of this plan in the Asian countries fighting against imperialism both at the end of the First World War and after it.

4. Revolution in Asia and the Turkish National Struggle

Russia didn't have a plausible environment for the proletarian revolution, which Marx had envisaged, in the beginning of twentieth century. First of all, although its economy was based on agriculture, its factories were few and inefficient; After all, the industrial proletariat was small. Most Russians were peasants cultivating land owned by wealthy nobles. In brief, Russia was closer to feudalism than to capitalism. However, there was a smoldering discontent in the countryside, and Lenin's Russian Social-Democratic Workers' Party found an opportunity to harness it to overthrow the autocratic regime and replace it with a radically divergent economic and political system. Prior to this, it was assumed that with the revolution in Europe, the help of the victorious western proletariat to Russia in the fields of industry and technology would pave the way for socialism in Russia³⁴.

We can construe that the revolutionary movements in the West increased the hopes of the Bolsheviks, who were struggling with those intervening to eradicate the Bolshevik revolution from outside, the bourgeoisie-style elements within Russia, and many ethno-religious separatist groups. However, the revolutionary movements in the West, as stated in the previous part of our study, had concluded with failure. Besides the materials supplied to White Russian armies, British contingents in the Caucasus and Central Asia conducted some operations in the first months of 1919 that obviously targeted Soviet forces. Due to this British attempt, the Middle East

³⁴ Terence Ball and Richard Dagger, "Communism after Marx", Britannica, link: <https://www.britannica.com/topic/communism/Communism-after-Marx> (Date of Access: On May 10, 2022). See also: (Page, 1952: 67).

became a diplomatic battlefield between Great Britain and Soviet Russia in 1919. Under these circumstances, Soviet Russia, in default of any other means of defense, found itself compelled to launch a general diplomatic offensive in Asia against Great Britain. On the other hand, we also see that the Bolsheviks sought to make use of the concept of self-determination in their struggle against British imperialism. At the 8th congress of the Russian Communist Party held at the end of March 1919, Nikolai Bukharin stated that the Bolsheviks sacrifice nothing if they put forward the resolution of the right of self-determination for the colonies, the Hottentots, the Negroes, the Indians, etc. Reversely, the Bolsheviks win; for the national acquisition altogether shall be detrimental to foreign imperialism. The most outright nationalist movement, for instance, that of the Hindus, is helping the Bolsheviks unwittingly, because it conduces to the devastation of English imperialism. In line with these statements, the congress confirmed a revised party program which noted that the wide-ranging progress of imperialism had sparked off an intermingling of civil war in particular countries with the revolutionary wars of assaulted proletarian countries and persecuted peoples against the servitude of the imperialist powers and demanded a policy of unifying the proletarians and semi-proletarians of various nationalities for a mutual revolutionary struggle against landowners and bourgeoisie. Subsequently, at the Second All-Russia Congress of Muslim Communist Organizations in 1919, Lenin purported that the socialist revolution would not be only or primarily a struggle of the revolutionary proletarians in each country against its bourgeoisie-on the contrary, it would be a challenge of all colonies and subordinated countries against international imperialism. Within the Resolution of the Congress, it was elucidated that the question of the international social revolution would not be able to be resolved without the association of the east (Carr, 1966: 237-238).

We can say that the main goal of this policy is to put the European states in trouble in Asia, which provided the main source of raw materials for imperialism, and thus render their efforts to destroy the revolution in Russia infructuous. Following the Bolsheviks took over the administration in Russia, Lenin wanted to benefit from the notion of self-determination³⁵ in the struggle against imperialism by entitling the nations living in the territory of Tsarist Russia for self-determination. According to him, worldwide civil wars had to

³⁵ For more information on the evolution of ideas about the principle of self-determination propounded by Bolshevik leader Lenin, see: (Lenin, 2004: 45-53, 117-124).

be instigated to subvert capitalism, and self-determination was the strongest weapon for this. If all colonial peoples and captive nations were rebelled by wielding this weapon, capitalism would collapse and then international socialist revolution could take place. However, as the civil war began to develop in the interest of the Bolsheviks from 1920 onwards, the Bolsheviks began to consolidate their sovereignty over the territorial heritage of Tsarist Russia. The influence of self-determination principal in domestic policy started to wane with this occurrence. This principle was started to be used by the Bolsheviks as the overriding slogan in the propaganda directed against the colonial peoples and especially the nations waging a national struggle against the westerners, such as the Turks, with the aim of a world revolution (Armaoğlu, 1962: 230-231, 246-247).

While scrutinizing the struggle against imperialism around the world, Lenin did not fail to notice the new revolutionary movements in China, Iran, India and Turkey³⁶. One of the Muslims of India, Mevlevi Bereketullah, had come to Istanbul in 1915 and asked for help from the Ottoman State and Germany for the fight against the British. Yet due to the defeat of Sarıkamış, the Ottoman State had got no claim in the East, and its plans for the region had been interrupted. Bereketullah was presuming that India could be saved from becoming a British colony with a socialist revolution In the wake of the war. In addition, he interviewed with Lenin in Moscow on November 23, 1918, and submitted his program named “Eastern politics” or “Indian Revolution Project” (Akal, 2013: 70-72)³⁷.

War had broken out between Afghanistan under Amanullah Khan and Great Britain approximatively at the same time with this event³⁸, and the newly enthroned Khan had sent a letter to Lenin for help (Carr, 1966: 240). As the state of affairs after May 1919 denoted, the revolutionary movements in Asia became one of the issues that would most concern the Bolsheviks.

One of the most important geographies where the changes had profoundly taken place after the Bolshevik Revolution was the Anatolia, which was the center of the Ottoman lands. Within this framework, Bolshevik Russia was the first to contact Mustafa Kemal Pasha, who went to Samsun in

³⁶ See: Vladimir Lenin, Горючий материал в мировой политике, link: <https://leninism.su/works/55-tom-17/2749-goryuchij-material-v-mirovoj-politike.html> (Date of Access: On May 19: 2022)

³⁷ A few months before this program was presented to Lenin, Stalin also had written articles relating to this subject in the newspaper "Jizn Natsionalnostey". However, his superficial mention of this issue could not lead to extensive negotiations.

³⁸ See also: (Barthorp, 2002).

May 1919, and initiated the struggle for the liberation of Anatolia. Mustafa Kemal Pasha's first serious contact with the Soviet representative occurred in Havza at the beginning of June 1919. According to Hüsametdin Ertürk, who worked in the Intelligence Department of the General Staff during the Turkish National Struggle, while Mustafa Kemal Pasha was still in Havza, he most likely met with Bolshevik representatives between the days of 7-12 June³⁹. The Bolshevik representative suggested to Mustafa Kemal Pasha that they could aid the Turks in the war against the imperialists and he wanted to learn what kind of a regime would be established in Anatolia, which was an indication that the Bolsheviks purpose was to impose their own regime in Anatolia (Sonyel, 1987: 83)⁴⁰.

Soviet Russia, indeed, pursued a policy aimed at spreading "Bolshevism-Communism" especially for the regions like Turkey and wanted to export the new regime to the countries around her. Soviet Russia, under the leadership of Lenin, intended to protect its own borders and constitute affiliated satellite states through these activities. Anatolia was at the forefront of the geographies where the Bolsheviks desired to spread Bolshevism in Asia. Owing to this policy, Soviet Russia would not only secure its own southern borders if the Anatolian geography adopted communism-bolshevism but would also have achieved a great victory against the imperialist powers in the region. Furthermore, if this attempt became successful, the security of Baku oil would also be ensured (Kırkpınar, 2019: 35).

However, it was known that Soviet Russia was the only major state from which the Turkish National Struggle movement, which started in Anatolia after the Armistice of Mudros, could receive the foreign aid it needed. For this reason, it was considered a strategic obligation to provide assistance from the Bolsheviks during the years of the National Struggle. The positive approach of the Turkish national movement in Anatolia towards the Russians was also due to this obligation. Thereby the Bolsheviks, who contrived their foreign policies within the framework of the thesis of rapprochement with the revolutionary movements in Asia, designed to

³⁹ Hüsameddin Ertürk describes this representative as Colonel Semyon Budyonny. Budyonny was serving elsewhere in the Russian Civil War at this time. According to Mehmet Perinçek, this Bolshevik representative was the famous Georgian revolutionary Budu Mdiviani. See: (Perinçek, 2007: 29-32). According to Salâhi R. Sonyel, though, The Soviet representative whom Mustafa Kemal Pasha met in Havza was Colonel Budienny. See: (Sonyel, 1987: 83).

⁴⁰The issue of Bolshevik aid was also mentioned in the letter sent to Kazım Karabekir Pasha from Havza on 7 June by the Staff Major Hüsrev Bey. For the full text of the letter, see: (Karabekir, 2008: 64-67).

accelerate the revolution expected from Europe and to strike a blow against Great Britain regarded as the main enemy, were monitoring enthusiastically the Turkish National Struggle, which began to flourish in Anatolia in those days (Kırkpınar, 2019: 35-36). Although Mustafa Kemal Pasha, who was approaching precautiously to the winds of Bolshevism within the framework of the Soviet rapprochement and did not want to be left behind in receiving aids to Anatolia, stated that he was "thinking of a system based on state socialism" and that it was "impossible to accept communism", he consented to barricade Turkey between Bolshevik Russia and its enemies in return for the help (Sonyel, 1987: 83-84).

According to the telegram Mustafa Kemal Pasha sent to Kazım Karabekir Pasha in June 1919, it was obvious that he was considering getting financial or military aid from the Bolsheviks and using them as a threat against Great Britain. Hence, British Foreign Secretary Lord Curzon warned Prime Minister Lloyd George that the dubious talks between Mustafa Kemal Pasha and the Bolsheviks would turn into a hazardous alliance against them, but this warning did not work (Gürün, 2010: 11; Sonyel, 1987: 86; Sonyel, 1991: 119).

During the Erzurum Congress, the relations to be established with the Bolsheviks were debated and it was determined to conduct the relations with the Bolsheviks by Kazım Karabekir Pasha. In the written appeal of the People's Commissariat of Foreign Affairs of Russia to Turkey on 13 September 1919, it was stated that the Soviets anticipated the workers and peasants of Turkey to thrust out their friendly hands to them in order to repulse the European exploiters together (Gürün, 2010: 19)⁴¹. As it has been seen, accentuating just the workers and the peasants of Turkey within this declaration indicated that the Bolsheviks still deprecated the cooperation with non-Bolshevik forces.

Since 1920, notwithstanding that some former members of the Committee of Union and Progress in Istanbul and Turks in Europe had some contacts⁴² with the Bolshevik representatives, we see that these contacts didn't bear any tangible outcome. It can be conceived that the hesitation of the Bolsheviks in helping the national struggle movement in Anatolia from the

⁴¹ For the full text of the communique, see: (Gürün, 2010: 15).

⁴² Here, the interviews of Mr. Baha Sait, sent by Mr. Kara Vasıf to Baku, can be signified as an exception. But the treaty signed by him was not recognized by Ankara, which had no information on it, and the Bolshevik administrators in Moscow were not aware of it either. See: (Gürün, 2010: 24-32).

beginning of the mutual contacts was based on doctrinal reasons. Despite the fact that the Bolsheviks kept the relations at a good level, they did not provide any concrete aid yet, and they constantly enhanced their own propaganda in Anatolia (Kurat, 1990: 594-596; Kırkpınar, 2019: 33-34). As it is understood, the way to cooperate with the movements with the national struggle has been opened by the doctrinal changes made in the Comintern in Moscow, and this has immediately felt its effect in the relations with Anatolia.

In the letter of Mustafa Kemal Pasha, written in April 1920 and sent to Russia at the beginning of May and recognized as the commencement of official relations between Turkey and Soviet Russia, it was highlighted that there should be a joint struggle against imperialism, yet the issue of bolshevikization or communistication of Anatolia was not articulated (Kemaloğlu, 2015: 76; Gürün, 2010: 32-33). It can be said that this letter was considered by the Bolsheviks as a call for help of the national liberation movement in Turkey, which was fighting against imperialism.

Thus, the letter of Mustafa Kemal Pasha was replied with the signature of Chicherin, People's Commissar for Foreign Affairs of Russia, on June 3, 1920. Within the letter, Çiçerin stated that The Soviet government extended the hand of friendship to all nations of the world, remaining loyal to the principle of self-determination, and he was content to see that friendship had substantial foundations with the Turkish nation. It was also pointed out that they were pleased with the establishment of mutually good relations, and it was designated that Bolshevik Russia respected and supported self-determination, and Bolshevik Russia was against capitulations. Moreover, it was done with saying: "*The Russian Soviet Government records the desire expressed by the Grand National Assembly to participate in the military action against the imperialist governments with the aim of liberating the nations under pressure*". These expressions had been marked in response to Mustafa Kemal Pasha's such statements in his letter written in May, 1920 as follows: "*We acknowledge cooperation with the Bolshevik Russians, who envisaged the operation against the imperialist governments and the aim of liberating the oppressed people who were under their domination and captivity*" (Gürün, 2010: 33, 51-52).

Mustafa Kemal Pasha wrote a reply to Chicherin's counter letter on June 20, 1920 and it was also stated in this letter that official representatives were dispatched by Ankara to Moscow. In fact, the Turkish delegation was able to reach Moscow on July 19, 1920. Still, almost no meeting took place until August 17, 1920 within this period, due to the ongoing negotiations

regarding the Second Congress of the Comintern in Moscow (Gürün, 2010: 36, 53-54). One of the most primary and vital issues on the Comintern's agenda in this process was the elimination of doctrinal contradictions that restrained the relations of the Bolsheviks with the movements in Asia. We can tell that the relevant decisions to be taken by the Second Congress of the Comintern, held in July 1920, determined the direction of relations with the movement in Anatolia and drew a road map for future activities.

As it can be inferred, despite the former marks of less authorised Soviet statesmen, the Bolsheviks, who had closely monitored the Turkish National Struggle movement from the first days of its inception and had contacted the national movement in Anatolia several times, could provide the first official financial aid in the summer of 1920 (Çalışkan, 2006: 39). Powerful circles in Kremlin were refraining from forming military or diplomatic alliances with non-communist movements until the winter of 1919-1920 and reckoned that propaganda against all capitalist states was the most influential instrument of Soviet foreign policy. Such were the circumstances when the Second Congress of the Comintern, held in July 1920, proceeded to formulate a policy on "the national and colonial question" (Carr, 1966: 252-253)⁴³.

Before touching upon the negotiation of "the national and colonial question" in the Second Congress of the Comintern, it entails to mention briefly the approach of the Bolsheviks relating to revolutionary movements in the East. While some decisions were taken at the Second Congress of the Comintern on how to handle the national movements in Asia, persons such as Sultan Galiyev⁴⁴ and Mustafa Suphi wrote articles concerning the position of the East in the world revolution. On the other hand, Josef Stalin said that a complete victory over imperialism was unthinkable unless the East was dispossessed of imperialism. According to them, although there have been various revolutions in the great states of the East in the recent past⁴⁵, none of

⁴³For more information on the approach of Marxism to the wars, see also: *Marxism & War Writings of Marxists on Imperialist War, Military Science, Revolutionary War, Insurrection and Guerilla Warfare*, link: <https://www.marxists.org/subject/war/index.htm>, (Date of Access: On May 4, 2022). See also: (Kára, 1968).

⁴⁴ Mirsaid Sultan Galiyev, the founder of National Communism, served in important positions in the bodies of the Communist Party, and was imprisoned for a short time in 1923, being accused of Pan-Islamism and Pan-Turkism. After a while, he was set free with the intervention of Lenin. Sultan Galiyev, who was later deposed of the Communist Party, was imprisoned for 6 years in 1927. Finally, he was imprisoned in 1937 and subsequently executed in 1940. See also: (Galiyev, 2010: 9-16).

⁴⁵ The Young Turk Revolution in the Ottoman Empire in 1908, the Chinese Revolution in 1912, and the Iranian Revolution of 1905-1911 have been meant here.

them had the characteristic⁴⁶ of a socialist or workers' revolution (Akal, 2013: 81-83; Carr, 1966: 266)⁴⁷. In his article he wrote in 1908, Lenin addressed these revolutions, and stated that in wake of the victory of the Chinese revolution, which took place a few years later, the East ultimately took the path of the West, and that the ideals adopted by the workers of the West would be adopted by them as well. Yet he addressed nothing relating to the alliance of the socialist revolutionary movement with the colonized democratic revolutionary movements struggling for national liberation. Another Marxist theorist, Karl Kautsky, pointed out that following the revolution in Europe and the USA, where capitalism was fully developed, this revolution would constitute model for "semi-civilized" countries and a proletarian revolution would take place there as well⁴⁸.

As is seen, the constitution of the doctrinal foundations of cooperation with the movements in Asia in 1919-1920, which had not been deliberated much before⁴⁹, stemmed from political occasions. As it may be comprehended, the enemies of the collaborating forces were also the enemies of the Bolsheviks. Thus, Soviet foreign policy in the Middle East took dual shapes: "the struggle for world revolution" and "the struggle against Bolshevik Russia's main enemy, Great Britain" (Carr, 1966: 221, 232). As it may be perceived, refraining from the criticisms of opposing the Marxist doctrine and allying with nationalist and religious movements, Lenin made this concern to be negotiated in the Second Congress of the Comintern, with the aim of stipulating it as parts of the same system with the concept of revolution in Europe, and thus to remove the existing ideological obstacle. It was argued as "the national and colonial question" at the congress.

Despite the fact that little place was given to the national question at the First Congress of the Comintern, by 1920, the European revolution did not

⁴⁶ In his speech, Zinoviev, the chairman of the First Congress of Eastern Peoples convened in Baku in September 1920, called the First Russian Revolution that broke out in 1905 as the trial of the 1917 October Revolution, but also classified the Young Turk Revolution as the reflection of the First Russian Revolution. See: (Doğu Halkları Kurultayı Belgeleri-II, 2000: 131).

⁴⁷ Lenin wrote an article titled "Asia's Awakening" on this subject on May 7, 1913, For the full text of the article, see: (Okan, 2006: 186-187).

⁴⁸ Vladimir Lenin, Горючий материал в мировой политике, link: <https://leninism.su/works/55-tom-17/2749-goryuchij-material-v-mirovoj-politike.html> (Date of Access: On May 10, 2022); Karl Kautsky, "Socialism and Colonial Policy (1907)", link: <https://www.marxists.org/archive/kautsky/1907/colonial/index.htm> (Date of Access: On May 10, 2022); See also: (Carr, 1966: 232-233).

⁴⁹ This issue was not generally mentioned in the First International, and Rosa Luxemburg mentioned it for the first time in the conference of the Second International held in Paris in 1901. See also: (Carr, 1966: 232).

take place contrary to the expectation of the previous year, and instead there were large demonstrations against Japanese colonization in China and Korea in the spring of 1919, it was made out by the Bolsheviks that anti-imperialist struggles in the East could help stabilize the shaky Soviet regime (McDermott and Agnew, 1996: 159-160).

5. The Negotiations at the Second Congress of the Comintern and the Support Presented to Anatolia by the Bolsheviks

“The national and colonial questions” was debated comprehensively at the Second Congress of the Comintern. Roy⁵⁰ and Lenin were the primary figures in the discussion. While these figure’s approaches resembled each other, they put forward different opinions from each other on some issues. Both of them believed that it would be difficult for Western capitalism to collapse if Asia, which supplied capitalism with its raw materials, was not lost by the imperialist powers. Accordingly, capitalism was actually doomed to decline when it was deprived of its main sources of raw materials. At the congress, the negotiations were about what type of cooperation the communist parties in the colonial regions would have with the local bourgeois-nationalist forces, and what the roles would be of the numerically small but politically conscious urban workers and the inarticulate peasantry whose number was huge compared to the others. While Lenin acknowledged the possibility of communist movements collaborating with radical nationalist elements and even assuming their temporary leadership, Roy spurned such subordination of the communist movement to the national bourgeoisie. In other words, various conceptions were delt, such as ensuring the autonomous existence of local communists or condoning the dissolution of communist groups within these national movements, described as small bourgeois movements. Unlike the previous congress, there were many Asian representatives in the second Congress. In addition to those from the former Russian Empire, representatives had attended from India, Persia, Korea and China, even from the Dutch colony of Java. John Reed was also representing the revolutionists

⁵⁰ Manabendra Nath Roy was a Bengali Indian revolutionist. He commenced his initiatives with nationalist reflexes against British Empire, and later became a communist after getting acquainted with it. He fled the United States, where he had taken refuge, for collaborating with the Germans against Britain, and went to Mexico. He founded the Mexican Socialist Party in 1917 in Mexico. Here he met the Bolshevik Borodin and, due to his reference, he was invited to the Second Congress of the Comintern by Lenin. For more information on this topic, see: (Basannavar, 2007).

of the United States (McDermott and Agnew, 1996: 160; Carr, 1966: 253-255).

A commission was established in order to negotiate the colonization of Asian countries and the national affairs, and Maring⁵¹, representing the Dutch colony of Java, was appointed as the head of the commission. Resolutions of Roy and Lenin were debated for two days at the commission. Roy pointed out that the bourgeoisie in capitalist countries was able to fend off the proletarian revolution only by funding the workers out of the earnings of colonial exploitation and propounding that revolution in Europe was unfeasible until the Asiatic countries had discarded the despotism of European imperialism. Lenin, on the other hand, purported that the world was divided into two poles: There were imperialism and its adherents on the one hand, and Soviet Russia and its followers on the other. According to Lenin, these two poles were in a struggle, and in this struggle, an alliance of the Bolsheviks and the national liberation movements fighting against the colonialists were needed. For him, those who were colonised in Asia and the workers in Europe had mutual interests. Due to this reason, the Bolsheviks, who would fight against the colonisers of the peoples in Asia and ally with the Asian peoples, would subvert capitalism by galvanising the workers in Europe, thus, the peoples in Asia would be emancipated from feudalism. The well-esteemed countries in these regions must determine themselves based on the degree of their development, whether the movements with which this alliance would be formed proletarian-communist or bourgeois-democratic, considering local and regional circumstances (Carr, 1966: 254-255).

Since this alliance which Comintern would guide were not permanent, the cooperation would terminate following the end of the struggle against colonization. Within this respect, the main issue was not to allow the local and newly emerging communist factions to mingle and dissolve as an ideology, regardless of the form of the movement. According to Roy, while the first type of movements in the colonies were of a bourgeois-democratic nationalist movement, they were fighting for national freedom only within the capitalist system. The second type was the movement called “a struggle of landless peasants against every form of exploitation”. Roy objected to the second type of movements being libeling to the first type. Although Roy’s thesis was encountered with sympathy in the negotiations at the congress, Lenin’s thesis

⁵¹ Maring of Dutch origin, or Hendricus Josephus Franciscus Marie Sneevliet, with his real name, is a communist who generally had activities in the east. See: (Lunn, 1995: 909-910).

was recognized with a few minor amendments. His thesis recommended that communists in colonial countries ought to advocate the bourgeois-democratic national liberation movements existing in these countries. Hence, we can state that Lenin legitimized the support of such movements by the Bolsheviks as in Turkey. The representatives, who challenged to the inclusion of the word “bourgeois-democratic” in the final outline, forced it to be replaced with the word “revolutionary”. According to Carr, another amendment made owing to the efforts of the Turkish representatives attending the congress was related to Enver Pasha. Within this respect, by designating Enver Pasha, it comprised additions regarding the struggle against pan-Islamic and the pan-Asiatic movement and identical propensities. These additions appear to have been made in the presence of the Turkish delegate, who disapproved of the support for the Turkish national revolt against western imperialism to degenerate into the prevailing propensity for pan-Islamic movements, such as were being supported at this instant by the Enver Pasha. Apart from that, Maring specified that there were no substantial discrepancy between the thesis of Roy and Lenin, and Roy’s thesis was also confirmed. Still, this thesis was forgotten as of that moment, and Lenin’s resolution played a determining role in establishing relations with the revolutionary movements in Asia. Therefore, “Theses on the National and Colonial Question”, adopted by the Second Congress of the Comintern, allowed temporary agreements or alliances to be formed between communists and nationalist forces in the colonial territories on July 28, 1920. The exact form of such alliances was not enunciated, yet it was deemed that the independent character of the proletarian movement would be preserved (Carr, 1966: 255-257; McDermott and Agnew, 1996: 160-161)⁵².

Thus, there were no doctrinal challenges with this resolution of the Comintern, that could prevent Bolshevik Russia from providing military and financial aid to the national liberation movement in Anatolia, and the proceeding negotiations and relations between the Government of the Grand National Assembly and the Bolsheviks were shaped entirely within the

⁵² For the full texts of the thesis, see: (Riddell, 1991: 283-290). For more information on Lenin’s speeches in the second congress of communist international, see: В.И.Ленин и Коммунистический Интернационал, link: <https://leninism.su/books/4226-vilenin-i-kommunisticheskij-internaczional.html?start=4> (Date of Access: On August 3, 2022); Viladimir İlyiç Lenin, The Second Congress of The Communist International: July 19-August 7, 1920, “Report of the Commission on the National and the Colonial Questions” link: <https://www.marxists.org/archive/lenin/works/1920/jul/x03.htm#fw3> (Date of Access: On August 3, 2022)

framework of real-politics and mutual interests. The main reasons that prompted Mustafa Kemal Pasha to receive foreign aid from Soviet Russia and to ensure Turkish-Soviet cooperation were briefly stated as follows:

- “1- Soviet Russia stated that it had deprecated Tsarist Russia’s conventional policy of entitlement on Istanbul and the Straits. The Soviets had demonstrated bona fides to those who initiated the National Struggle by abandoning all traditional demands on Istanbul and the Straits.
- 2- The Soviet administrators were not in favor of the establishment of a strong, sovereign Armenian State in the East, like the leaders of the Turkish National Struggle. It was anticipated that the Soviets would help the assault to drive out the Armenians who occupied a part of the lands of Eastern Anatolia, or they would at least remain neutral. Because a strong Armenia with the support of the Entente Powers would pose a threat the security of Soviet Russia as well as Turkey.
- 3- An independent Turkish state would play a crucial role in eradicating the British threat in the south of Soviet Russia and in the Caucasus. It was comprehended that the Bolshevik rulers, who were concerned to protect their presence and the new regime, would do their best to avert such hazard (Müderrisoğlu, 1974: 533-534)”.

In essence, in the course of the real-political approach pursued in bilateral relations, the Bolsheviks no longer put forward the condition of accepting communism as in previous contacts. Nevertheless, while battle of the Turks against foreign imperialism was countenanced, it was stated that the work would not end with driving out foreign imperialism from the country, by implying that the Turkish national movement was not communist, in the First Congress of the peoples of the East, which was organized in Baku to spread the revolutionary activity among the peoples of the East, -as it can be perceived from the extensive quotation below-. It propoled the workers of the east generally to defy not only the ‘foreign capitalists’ but also ‘local extortionists’. Mutyshev, a delegate from the Caucasus, voiced it regarding Turkey: “*Mustafa Kemal’s movement is a national liberation movement. We support it, but, as soon as the struggle with imperialism is finished, we believe that this movement will pass over to social revolution*”. According to them, If Mustafa Kemal Pasha’s administration maintains the capitalist society alive as they are, and expels the British and manages to make England recognize their independence, they will proceed to be economically dependent on England.

As we can understand from these statements, the plan of the Bolshevik Russia administrators was to try to Bolshevikize those countries after the imperialists were fended off those countries. In addition, although the occasion of supporting the Turkish National Struggle movement was featured in the congress, it was clearly stated by Zinoviev, the president of the congress and the Communist International, that “the national struggle movement was not communist”, and it was also articulated next to the Anatolian representative that the main reason for their support was the British threat (Adıgüzel, 1985: 14-15; Carr, 1966: 262, 265; Birinci Doğu Halkları Kurultayı Belgeleri-II, 2000: 100; Ada, 2018: 1093; Şehidoğlu, 1975: 124-134, 145-148)⁵³.

Thereupon, the statement titled “To the oppressed public masses of Iran, Armenia and Turkey” published by the Executive Committee of the Communist International at the First general assembly of the Peoples of the East in Baku was as follows: “...*And tomorrow, when foreign capitalists grant your masters more favorable terms of peace, your present leaders shall enchain you with the aid of foreign masters; just as the landlord and former officers have been already doing in areas accommodating foreign armies... Anatolian peasantry! You are being called under the flag of Kemal Pasha to fight against foreign invaders. But we also know that you are striving to found the party of your own Peoples and Peasants. This is the only party that shall have the aptitude to contend with the occupiers, even if the pashas reconcile with the coloniser Entente Powers* (Adıgüzel, 1985: 14-15)”.

We can infer from these words that considering Moscow’s support for the Turkish Communist Party, which was founded in Baku on September 10, 1920, Moscow intended to enforce a communist policy with its forces after the Turkish National Struggle eventuated with the ridding of the British in Anatolia. In fact, the Bolsheviks had prepared for this phase of the policy towards Anatolia long beforehand, within this framework, they had incessantly expedited communist propaganda materials to Anatolia, and they had performed significant works for the spread of communism through different press organs and various booklets (Kırkpınar, 2019: 50-51). Mustafa Suphi, who came to Baku from Tashkent after the Bolshevikization of Azerbaijan in this period, signified in the report he wrote to the Central Bureau that the main purpose for his visitation was “to form a Soviets government in a short term in Turkey” (Aslan, 1997: 85). Albeit, In parallel

⁵³For more information related to Zinovyev see also: ЗИНОВЬЕВ ГригорийЕвсеевич, Большая российская энциклопедия, link: https://bigenc.ru/domestic_history/text/2879281 (Date of Access: On August 4, 2022)

with the deterioration of Mustafa Kemal Pasha's relations with the Bolsheviks since the end of 1920, the communist groups went underground and suspended their propaganda as a result of his tenacious struggle against their propaganda inside, and these communist group's power dwindled gradually over time (Kırkpınar, 2019: 51). As is seen here, Mustafa Kemal Pasha's relations with the Bolsheviks focused only on mutual assistance and were not based on any ideological association.

In Bolshevik Russia, the desire to support the National Struggle movement in Anatolia was stimulated prior to the Comintern's decision on this matter, and a new process was launched to organize actions for that. As it can be fathomed from the negotiations in the Comintern, the main point of the topics deliberated at the congress was not whether a hand should be lent by Soviets to Anatolia, but in which direction the cooperation should take within the given time, and such other practical-strategic issues were involved. In the days following the Sivas Congress, Halil (Kut) Pasha, who was sent to the Caucasus and Russia by Mustafa Kemal Pasha in September 1919 to seek help, initiated such activities for that (Ersoy McMeekin, 2007: 41-43). In his negotiations with the Bolshevik administrators, Halil Pasha mentioned the role that Anatolia could play in the revolution in Asia, its significant place in the Muslim world, and that it could spread the anti-imperialist movement to India, Iran and Afghanistan. Additionally, he pledged that the Turks would be able to assist the Bolsheviks in their foreign policy regarding the Middle East (Çakıcı, 2021: 140-141). As is seen, these conversations correspond to the issue discussed at the Second Congress of the Comintern. Considering all these, although it was stipulated to see through in the congress, transporting the aid was postponed. In deed, subsequent to the occupation of Azerbaijan by the Bolsheviks, military garrison in Ganja (Gence) attempted to revolt on May 28, 1920, namely on the anniversary of the establishment of the Azerbaijan Democratic Republic. The relations of Nuri (Killigil) Pasha with the insurgents, problems regarding the roads passing through Armenia during this period, and the suspicions of the Bolsheviks, emanating from the ceasefire between Ankara government and France⁵⁴, delayed the departure of aid (Çakıcı, 2021: 144).

During the days when the Comintern settled its stance towards the revolutionary movements in Asia, the problems with the outset of Soviet aid

⁵⁴ For more information related to ceasefire between Ankara government and France, see: (Selçuk, 2022: 181-194).

to Anatolia were resolved⁵⁵. The first Bolshevik aid worth 500 kilograms of gold was able to be delivered in Erzurum on September 8, 1920, after the delays due to insecurity of the roads on which the aid would be delivered, as well as the constant raids and frequent attacks of the Tashnak Armenian terrorist organization gangs on the roads (Çakıcı, 2021: 146-148). Another remarkable event also occurred, giving rise to a turning point in the relations in July 1920, and the First Moscow negotiations began between the official representatives of Anatolia and the Bolsheviks (Cebesoy, 2002: 59). It wasn't possible to sign an official treaty between them as a result of these negotiations. Nonetheless, This problem ensuing from the changes in the foreign policy of Bolshevik Russia, was resolved after a short while with the Bolsheviks' proposal, and the Treaty of Moscow was signed between the Grand National Assembly of Turkey and Bolshevik Russia on March 16, 1921(Sonyel, 1991: 56).

CONCLUSION

Lenin, who asserted that the first phase of the revolution could be accomplished subsequent to the unification of the proletariat and the small bourgeoisie as of 1905, repeatedly argued in his 1919 speeches that sometimes it was necessary to go beyond what was expressed in Marxist doctrine for the salvation of the revolution. According to him, the doctrine had been modified in parallel with the conditions required by both the history of the revolution and the current incidents. Ultimately, in line this transition, until the Second Congress of the Comintern, he had inculcated “Theses on the National and Colonial Question” concerning the revolutionary movements in Asia on July 28, 1920, regardless of the objections of both Bolsheviks inside and of the purist doctrine supporters from non-Bolshevik leftist movements. Bolshevik Russia, which endeavoured to impose communism on the leaders of the National Struggle movement in Anatolia since the middle of 1919 and stated that Soviet aid could only be provided in accordance with these facts, entered a period of mitigation in this policy with the effect of the altering conjuncture and interstate relations. Pursuant to the new policy, the demand for communism, which was previously imposed on the movements to be assisted, was withdrawn. In order to demonstrate the prominence Bolshevik Russia attributes to this issue, the population of Soviet Russia in general decreased to 11 million in consequence of the wars that lasted for many years;

⁵⁵ For elaborate information regarding this subject, see: (Çakıcı, 2021: 118-177; Müderrisoğlu, 1974: 520-549).

It should be underscored that she had sent military and financial aid to the movement in Anatolia, irrespective of the 60% decrease in the number of workers in Saint Petersburg and 50% in Moscow (Kurban, 2017: 22). Apart from the military aid, the financial aid provided by the Bolsheviks to Anatolia was approximately equivalent to the one-year budget of the Ankara government during the National Struggle. Apart from the military aid, the subsidy of the Bolsheviks to Anatolia was approximately corresponding to the annual budget of the Ankara government during the National Struggle (Okyar, 1998: 159). The main goal of providing these aids, strikeing a great blow against the imperialism of the Great British Empire, was achieved, and an enlightenment movement was initiated under the leadership of Mustafa Kemal Pasha, which would inspire the other nations of the East. With the outcome of the victory of Turkish nation in Anatolia, the security of a large part of the southern borders of Soviet Russia was ensured, and a heavy blow was dealt to her greatest enemy, Great Britain. Irrespective of all these developments, Soviet Russia could not be influencial in envisaging Turkey to become communist and to act under the auspices of Soviet policy. Thusly, the Turkish nation established the Republic of Turkey as a national state, at the end of a national struggle through out this period.

Mustafa Kemal Pasha, who had foreseen that Bolshevik Russia could convert Anatolia to communism in the future, founded the Communist Party of Turkey in October 1920 and directed many of his friends from the National Struggle there to keep the communist movement within his knowledge. Over and above, he had manifested the necessary deportment towards such groups and he had gradually augmented his pressure against communist organizations outside his administration since 1921⁵⁶. In the declaration published by the Third International, such statements were formulated with regards to these pressures as follows: *“Turkish pashas have been sold to the imperialists. Turks, you have congregated under the banner of Mustafa Kemal Pasha. That pasha is also one of them. Turkish peasantry, you must know this. Unite among yourselves and get organized.”* Mustafa Kemal Pasha, voiced his attitude on this issue almost in the same period and gave an unambiguous retort to the statements of the Bolsheviks as follows: *“Now, I have a firm conviction that it is detrimental to establish parties similar to communism even on diplomatic bases in the country. I have ordered the immediate closure*

⁵⁶ For more information related to the subject, see: (Tevetoğlu, 1967: 124-184, 303-335).

of the artificial communist parties, along with the genuine ones (Meram, 1969: 297)”.

Bolshevik Russia targeted to start “World Revolution” by helping the movement in Anatolia to secure a large part of its southern borders, by striking a blow to Great Britain and, perhaps most importantly, by depriving Western imperialism of its exploitation of raw materials through its cooperation with the national freedom movements of Asia. Despite the great victory of the nationalists in Anatolia against the imperialists, they couldn’t fully achieve their goals of spreading their own revolutions in Europe and Asia neither in that period nor after this. “The World Revolution”, which was uttered by heart by Bolshevik leaders since the October Revolution, did not come out, and as of 1923, the term “Socialism in One Country” began to be articulated. The concept of “Socialism in One Country”, conceptualized by Josef Stalin and Nikolai Bukharin, which proceeded with the purge of the Left Communist Bolsheviks who were proponents of “Permanent Revolution” like Trotsky, became the dominant policy of the Soviet Union in 1924⁵⁷. The Republic of Turkey, on the other hand, never adopted communism, but took care to establish friendly relations with the Soviet Union in foreign policy until the end of the Second World War. The good relations between the two countries deteriorated when the Soviet Union demanded land and bases from Turkey right after the Second World War, and these Soviet demands were the main reason for Turkey’s intense diplomatic efforts to enter NATO in 1952 (Karakaş, 2013: 24, 161-164, 386-390).

⁵⁷ Trotsky described these changes as “to be dragged into thermidorist position, despite having the victorious communist banner in hand”. For more information on the Bolshevik Revolution through Trotsky’s aspect, see: Троцкий, 1997; Бухарин, 1988).

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CHAPTER 9

**LONG PURSUIT, FROM DATA TO KNOWLEDGE AND
DECISION. AN INTEGRATED COASTAL ZONE
MANAGEMENT PERSPECTIVE**

Dr. Özen ARLI KÜÇÜKOSMANOĞLU¹

¹ Mehmet Akif Ersoy Üniversitesi, Mühendislik ve Mimarlık Fakültesi, İnşaat Mühendisliği Bölümü, Burdur, Türkiye.
ozenarli@gmail.com, ORCID ID:0000-0002-2119-8074

INTRODUCTION

Coastal zones are important and vital regions. More than 60 percent of world population live in this narrow area. There exist various definitions to describe a coastal zone and given its high priority, it is within the interest of people, commerce, and a multitude of industries. Carter (1988) says:

“Coastal Zone is that space in which terrestrial environments influence marine (or lacustrine) environments and vice versa. The coastal zone is of variable width and may also change in time. Delimitation of boundaries is not normally possible; more often such limits are marked by an environmental gradient or transition. At any one locality the coastal zone may be characterized according to physical, biological or cultural criteria. These need not, and in fact rarely do, coincide”.

COASTAL ZONE MANAGEMENT AND DEFINITIONS

The coastal zone may have a width of a few hundred meters to kilometers depending on your study objectives. This transitional field of land and sea mostly includes ecologically sensitive and valuable habitats (Clark, 1992; Canessa, 1998). For centuries, human beings mistakenly have believed that it will infinitely serve them. Time proved that it was finite; indeed it has been drastically degraded since the beginning of the 20th century.

There are plenty of opportunities based on the resources and range of business fields. In the coastal zones with vast sea area, both land and coast resources are used in various ways. It is vital to consider the effects of land usage on the sea and the effects of the sea activities on the land and also the interactions among these. As a consequence of various uses, conflicts have been aroused for many decades.

It is important that the integrated management activities to be carried out considering these interactions and conflicts in the coastal zones are applicable and understandable by the decision makers. Many studies aims to develop methods employing information technologies in order to effectively manage the vast sea areas with profound land/sea usage. The necessity of such studies is noted in the projects and activities carried out in the field of Coastal Zone Management by many researchers.

Fortunately with the developments in information technologies, this structure in Coastal Zones can be managed more effectively today. Geographic Information System (GIS) is one of the important information technology fields.

When we look deeply at the literature, the importance of Coastal Zone, the evolution of management of this valuable area, the historical change of decision making and the tools that decision makers used are come into scene. For the last decade, beside statistical and GIS based tools, new geostatistical and analytical/mathematical calculation methods are integrated into the decision processes. Let us present briefly the relevant studies in this structure.

COSTAL ZONES, VALUABLE AND PROBLEMATIC

It is important to emphasize that coastal zones are inhabited by more than half of the world's population, and hosting two-thirds of the world's largest cities (Sorensen and McCreary, 1990; UNCED, 1992; Cincin-Sain, 1993; WCC, 1994; Cincin-Sain and Knecht, 1998). Water and other resources are depleted and degraded rapidly (WCC, 1994; Cincin-Sain and Knecht, 1998; Creel L., 2003).

All these demands cause conflicts between sectors and stakeholders have begun to raise governments and public concern (Cincin-Sain, 1993; Canessa, 1998; WWF and IUCN, 1998; Westmacott, 2002; Cao and Wong, 2007). Besides the deficient management efforts like ineffective control over coastal uses and not directly solving conflicts, inadequate legislations and regulations increase the need for proactive environmental management efforts, instead of solving coastal problems (Canessa, 1998).

A valuable approach, sustainability and integration

Integrated Coastal Zone Management (ICZM) is an internationally accepted approach to ensure sustainable development and managing resources. It is based on the Coastal Zone Management Act of 1972 in the United States, which allows policymakers and planners to take population issues into account when examining pressures, threats, and opportunities regarding coastal areas. ICZM has been mentioned repeatedly in major international conferences, including the UN Conference on Environment and Development in Rio de Janeiro, Brazil, in 1992 and the World Summit on Sustainable Development in Johannesburg, South Africa, in 2002. Integrated, also multidisciplinary and adaptive, management approach is needed for sustainable use of these resources without undervaluing the development and protection of coastal and marine areas and resources (Sorensen and McCreary, 1990; Clark 1992; Cincin-Sain and Knecht, 1998).

ICZM cases from 1970s to 2020s, Get into the stride

Sorensen reviews 142 ICZM efforts that had been finalized/initiated by the year 1993. Among those, the scope was mainly preferred as small scale

projects. Because ICZM efforts always need much time and resources, it is important to convince the administrative and funding bodies (Sorensen, 1993). In 1974, the number of coastal zone management project was 50 while the nation count was 13. This coastal zone management project number had been risen to 86 in year 1990 from 42 different nations. The review shows that, there are many outputs such as laws, regulations, inventories, management plans and geographical management systems. But Sorensen concludes that there is a great need to evaluate the outcomes of ICZM efforts, where environmental and ecosystem enhancement expected.

Studies shows that, the implementation of ICZM is often constrained by political systems in practice, especially after 90's. Study of Lau (2005) gives a political science perspective based on approaches inherent in neo-institutional and administrative theories. He said that a successful local ICZM working approach cannot be applicable to other regions without modifications to the organization structures of decision making and implementation besides geographic, biological and demographic studies.

There are many outputs of ICZM efforts such as management plans, laws, regulations, inventories, and Geographic Information Systems (GIS). Nonetheless, the achievements of those ICZM efforts are still not well known for most of projects because they usually not readily available to those who could benefit from its findings, conclusions and recommendations. Furthermore, it is very difficult to gain information from implemented ICZM projects about their success against unexpected developments and disasters. As a consequence, there is a great need to evaluate ICZM efforts to produce measurable outcomes and a need for extended research with case studies to assess the effectiveness of management actions in order to apply to other coastal regions (Sorensen, 1993; Lau, 2005).

Since defined previously as continuous, dynamic and iterative; ICZM is a long pursuit. There are many such examples from world. Two of them which lasted more than 20 years covering many legislative and regulative applications during the project are presented in detail to stress the broadness and duration. First one is from China which is the biggest growing economy of the world. There is broad range of problems in coastal zones of China: mainly point and nonpoint pollution rose with increasing population; generation of vast amount of wastes from coastal cities which are preferred by industries; high riverine pollutant fluxes. Ecosystem was also degraded by destruction of natural habitat by changing hydrodynamic system of the coasts and coastal reclamation which are resulted in extra habitat loss and coastal

erosion. Combined with other stresses, introduction of invasive species intentionally and unintentionally resulted in biodiversity loss in coastal fauna and flora. Cao and Wong states that economic growth and industrialization exacerbate the ecosystem degradation and environmental deterioration in China (2007). From 1980s to 2006, many projects were carried out and hundreds of legislation were formulated with involvement of more than 20 ministries. In order to solve adverse consequences of conflicting resource uses, interagency conflicts and overlapping jurisdictions need to be solved in the country. As a result of costal management plans and regulations for corresponding level the responsibility of agencies was reorganized and for better decision making procedures, China established an interagency Executive Committee and uses marine expert groups to maintain public participation, to obtain capacity building in implementing bodies (especially to raise the local intelligence) which is crucial. As a result of all projects, inventory and monitoring studies were carried out nationwide to meet the data requirements. In China, more than 3600 coastal marine sub zones were defined according to their functionality and the need for coherent management requirements (Cao and Wong, 2007).

The other example is from the largest archipelago country of the world. Indonesia faced overfishing and overexploitation problems because of population growth in coastal zones. ICZM efforts need funding, regulations and responsible authorities that implement coastal management programs. According to Farhan and Lim (2010), in Indonesia, four main factors that prevent the sustainable implementation of the ICZM programs are extra responsibility, national policy, lack of information exchange and bureaucracy. Common problems of Indonesian coastal zones are: rapidly raising settlements; worsening environmental quality and biodiversity; overfishing and increasing vulnerability to natural hazards which are shared with many coastal regions. In addition to these problems, developing countries faced with excess problems such as no state laws for ICZM implementation, funding, not considering users needs, and lack of capacity to evaluate ICZM programs that were performed by developed countries. In 1999, Indonesia established the Ministry of Marine Affairs and Fisheries to enhance coastal community welfare besides maintaining coastal sustainable development. Between 1987 and 2009, there were many ICZM projects carried out mainly by international funds. In 2005 INA-GOOS, a national GOOS program, was launched to support operational oceanography while integrating research agencies and local governments. Farhan and Lim (2010) stated that, for better and

sustainable management, DSS need to be developed to facilitate and assist decision makers in implementing and evaluating ICZM.

DECISION MAKING? TO DECIDE OR NOT TO DECIDE, THAT IS THE QUESTION!

In this respect, many of the major problems faced by decision makers involve multidimensional and spatially complex structures often with conflicting needs and concerns. There is a system need, because problems and solutions are all based on multiple parameters. There are many studies, or projects in the field, trying to find a solution to the conflicts and uses and degradation without mention the heading, DSS. Many surveys display an effort to set a system to repeat the desired results. The earlier decision making studies use multiple criteria in conjunction, by using expertise throughout the analysis processes, without refer to the name MCA. Therefore, on most, if not all, problems are tried to solve systematically and as broad as possible. In order to effectively manage the degradation on a sustainable basis, decision-makers can use DSS in order to have a more structured analysis of the problem and define possible options of intervention to solve the problem. DSS also improve our understanding of the inter-relationships between the natural and socio-economic variables and therefore result in improved decision-making (Westmacott, 2001). Iyalomhe et al. (2013) review and present the examined 20 GIS based DSS for coastal zones in terms of their technical criteria and applicability that stress the need for improved system understanding and scientifically supported decision making (Iyalomhe et al., 2013).

Nature is continuously changing and trying to find a balance that has been altered by mankind. Understanding and measuring the anthropogenic effects on nature is critical for effective management. Scientific communities struggle hard initially to slow down, hold back and lastly remediate deterioration of nature. They try to provide a sustainable world, to meet the needs of the present without compromising the ability of future generations to meet their own needs (Brundtland, 1987; Smith C. and Reed G., 1998). DSS are an important tool that uses information technologies to achieve sustainability.

DSS studies have been built and developed since the 1960s and after 1980s, they have been implemented in many technical areas widely from finance to space and to environmental field such as resource and

environmental management, environmental quality and their spatial applications. DSS are used from operation systems of manufacturing processes to environmental management issues (Groot et al., 2007; Oliveira and Antunes, 2004; Pallottino et al., 2005; Rao et al., 2007; Vallega, 2001; Young et al., 2000; Rodrigues et al., 2009). There has been a rapid expansion in the development and description of both quantitative and software system methods that can be applied to decision-making processes and many of these have application in the spatial domain (Hill M.J., 2005). New methods can assist with correlation of input data layers, subjective weightings, and mixing of qualitative and quantitative data by means of GIS. GIS based DSS have many usages under sustainable development concept such as resource management and assessment of environmental quality (Bunch and Dudycha, 2004; Chang et al., 1997; Claassen, 2007; Groot et al., 2007; Hill et al., 2005; Matthews et al., 1999; Rao et al., 2007; Simon et al., 2004; Vallega, 2005; Iyalomhe et al. 2013). Integration of mapping components enhances effectiveness and adoption of end user of developed DSS software and recent technical focus is placed on integrating relevant spatial data with useful multi-scale models under a user-friendly interface in a GIS environment (Chang et al., 1997; Matthews et al., 1999; Pallottino et al., 2005; Vallega, 2005; PenaCortes et al., 2013; Widiyanti, 2020). The design of the DSS software is evolving and it uses many models in combination like spatial interfaces (Olson et al., 2007; Simon et al., 2004). Since late 2000s, there are spatial decision support systems used for planning and business needs. After 2010, spatial planning tools (land use management, urban planning and settlement site selection and optimisation) are started to use in a commercial manner (Keenan and Jankowski, 2019). Today, there are plenty of public based servers and moreover, easy to use spatial decision support system applications from navigation tools to public service interface applications become widespread.

Many decision-making models and mathematical methods like cost-benefit analysis, risk analysis, system analysis, simulation models, multi objective and multi criteria analysis (MCA), multi parallel computing, fuzzy method, etc., have been developed in the world for solving problems (Fu, 2008; Heinrich et al., 2007; Jimenez et al., 2006; Kaklauskas et al., 2005; Zavadskas and Antucheviciene, 2007; Joerin, et al., 2001; PenaCortes et al., 2013; Gumbira and Harsanto, 2019). These methods and optimizations are used by many researchers together with programmers.

DATA VERSUS INFORMATION, ANALYTICALLY FIGURE OUT THE BIG PICTURE

Coastal zone managers endeavour to base their studies on mathematics by using analytical tools, techniques and methodologies (such as GIS, PCA, ANFIS and MCA...). In this way, they can produce knowledge -from data -related to the interface of legislation and science policy. Therefore, developing a system, which is reproducible, controllable and give feedback and also measure deterioration/remediation, gains importance in this very scientific era. GIS is a very important visualizing and analysing tool for spatial data. In the field, GIS is nearly essential. All other tools are embedded in GIS to enhance the control and interpretation of the system. Since, there are multiple variables, multivariate statistics are required. Factor analysis (like Exploratory Factor Analysis (EFA) Common Factor Analysis (CFA) and Principal Component Analysis (PCA)), cluster analysis and multiple discriminant analysis are some of those. Geostatistical tools are also becoming popular like kriging. But, some data are not spatial or geographically related to other spatial parameters as usual/perceptible manner. So, neural network approaches and setting the relationships of those parameters by this mathematical tool is become important. Adaptive Neuro-Fuzzy Inference System (ANFIS) is an adaptive intelligent system which is a combination of Artificial Neural Networks (ANN) and Fuzzy Inference System (FIS) (Jang, 1992). The parent study of Arli (2011) is one of the first attempts of geographical ANFIS application in the literature (Arli, 2011). Below some of those technical tools and DSS application literature examples are given.

One of the most important study areas that coastal zone managers dealt with is the sea level rise. In the study of El-Raey (1997), GIS, RS and modeling techniques were used to assess potential impacts on sectors and socioeconomy. The results of the study show that, 2 million people have to be displaced with a job and value loss for more than 200000 people. El-Raey (1997) states that coastal zone and resources are vulnerable to impacts of climate change and intense uses, and adds that ICZM approach is necessary for long term sustainable management. This vulnerability assessment shows that a GIS based DSS is necessary for future development and planning in Egypt.

Coastal ecosystems are increasingly threatened by lack of long run environmental policies and decisions, especially in tourism areas. Multi-dimensional analysis with ranking method with GIS is used by Kitsiou et al. (2002) for assessment of importance of zones in terms of coastal management.

The study area, a coastal region in Rhodes Island, was zoned in this study. Population, number of shops, hotel beds, and agricultural area and water quality parameters indicating eutrophication used as criteria for Regime multiple criteria choice method which is an important tool for policy analysis. The used methods gives the priority to the criteria and sub regions, therefore gives a tool for decision makers for evaluating the potentials of the coastal regions comparatively (Kitsiou et al., 2002).

The third study aims to develop a DSS for Catalonia coasts of Spain. Sarda et al. (2005) developed decision support tools as a methodological approach for coastal management. The study gives the outcomes of a 5 year coastal zone management project. The main sector in the region is tourism. Data was mainly composed of administrative, cartographic and socioeconomic data. All information was compiled in GIS. Sarda et al. (2005) used PCA to reduce the number of indicators. The indicators cover territorial, economic and social ones. After the indicator selection, the future planning scenarios are developed by using tools of GIS and visual interpretation.

River and marine water quality and its management are significant issues among environmental problems. There exist many technical DSS research efforts in the scientific era about the concept (Chen and Mynett, 2006; Kattaa et al., 2010; Baxter and Shortis, 2002; Bunch and Dudycha, 2004). Bunch and Dudycha (2004) states that it is required to have an approach that can deal with complexity and uncertainty. For this reason implementing “adaptive management” and “soft system methodology” methods and techniques with system thinking is compulsory. In this research two workshops held for the management of Cooum River in India. In the first workshop, stakeholders and researchers developed a water quality model and DSS. In the second one, the DSS was used to derive the management scenarios and impact of interventions. Bunch and Dudycha (2004) used GRASSLANDS GIS software and DESERT water quality simulation module and an interface to data transport and found that distribution of income is a key factor to improve the water quality. It is also emphasized that integrated and inter jurisdictional management is important for long run successive management efforts with the involvement of government agencies and NGOs.

There are further DSS studies which are developed to integrate economical pattern and sectorial dynamics of coastal zone (Olson et al., 2007); integrating social concerns and expert knowledge about politics and law by using Multi Criteria Decision Analysis tools (Hill et al., 2005; Siakavara and Eleftheriou, 2010); and enhanced by integrating remote sensing

or updated data to analyze consequences of the management efforts as feedback (Kainuma et al., 1991; Rao et al., 2007). Multi Criteria (Decision) Analysis is widely used in DSS for ICZM, especially in studies carried out for technical purposes such as site selection and suitability analysis. Some of these tools integrated in GIS software are easy to use but the determination of relationships between criteria (indicators) and their weights for calculations need to be set (Joerin et al., 2001; Salem, 2003; Hansen, 2007; Alves et al., 2011).

ANFIS has been used recently in DSS studies, especially in late 2000s. ANFIS, developed by Jang in 1992, has the ability to solve complex nature dynamics and problems by human-like reasoning, to enhance decisions. These methods are used in many areas, mainly in engineering, economics, remote sensing, emergency response, medicine, ecological studies, flood risk, water quality and basin management, climate change studies, planning, agriculture, etc. (Zhang et al., 2009; Olson et al., 2007; Verdonschot, 2000; Urbanski and Szymelfening, 2003; Arkhipov et al., 2008; Cui et al., 2010; Filippi and Jensen, 2006; Astel, 2007; Baxter and Shortis, 2002; Retzlaff, 2008; Chen and Mynett, 2006; Thumerer et al., 2000; Kattaa et al., 2010; Jesus et al., 2008; Bouayad and Emeriault, 2017). These continuously developing mathematical tools are even effectively used in DSS of emergency response plans which necessitate precise and immediate solutions (Chang et al., 1997).

In recent years, there are many climate change regional risk assessment studies trying to understand the national and global risks, since climate change and sea level rise have its impact mainly on coastal zones (Torresan et al., 2016; Iyalomhe et al., 2013)

Monitoring and advanced analysis of territorial and morphological changes of coastal and marine ecosystems integrated into the decision tools (Fiduccia et al., 2016; Santoso and Halog 2017). Even indigenous people knowledge is somehow tried to integrate into the new decision support systems by means converting knowledge into data (Aporta et al., 2020). Apparently, in the new era, the spatial DSS tools supported by popular commercial GIS software are evolving towards the participation of stakeholders and public into the decisions by taking more place in daily life of people Goble and Hill (2020).

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