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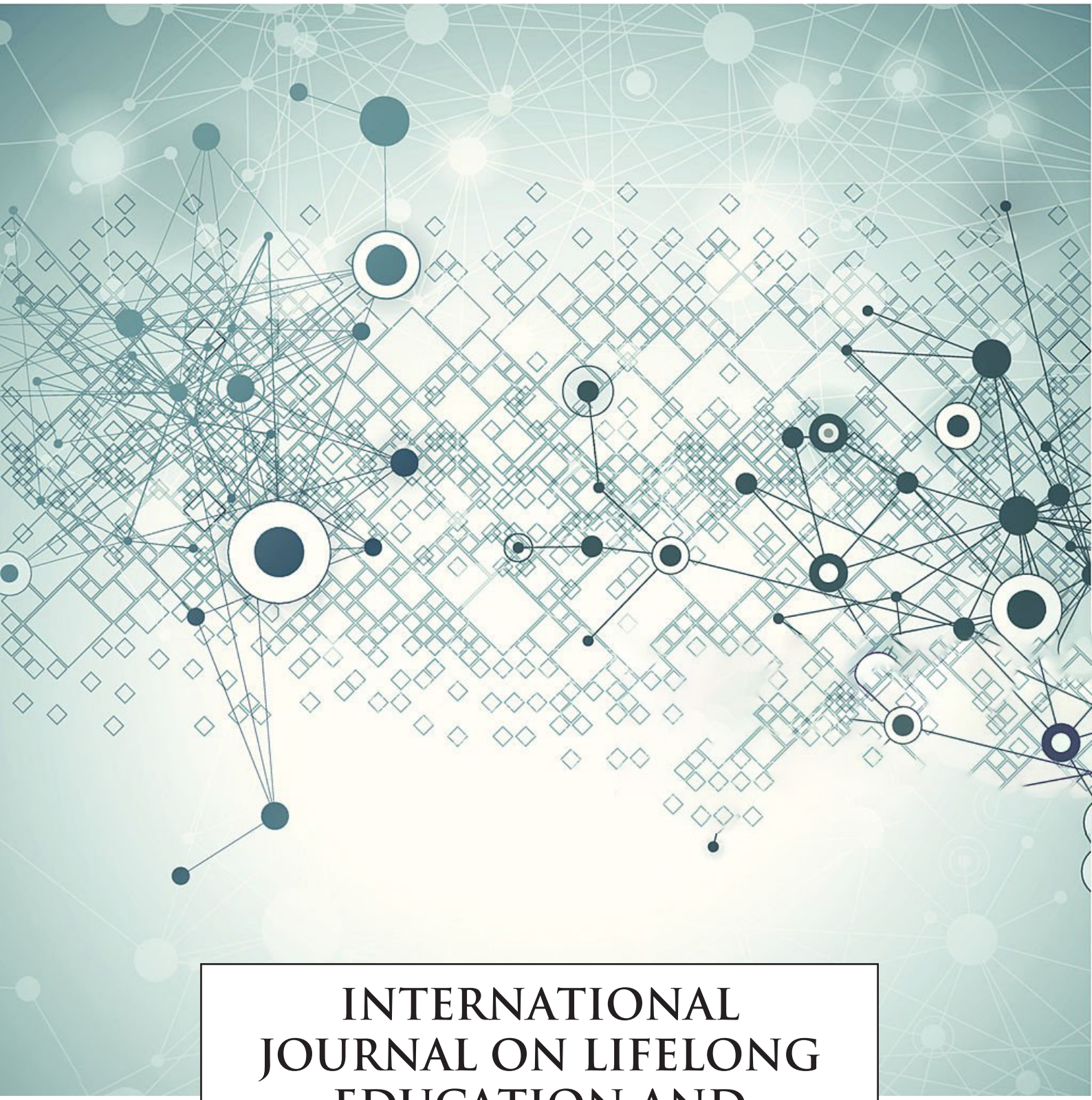

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CONTENTS

From the Editor

It is with great enthusiasm that we present Volume 10, Issue 2 of the International Journal on Lifelong Education and Leadership. This edition brings together a diverse array of research studies, each offering valuable insights into lifelong learning, education, and the challenges and opportunities facing educators and learners today.

We begin with the article by Kocabaş and Demirci, which explores the metaphorical perceptions of gifted students toward studying science lessons. Their research highlights the creative ways students conceptualize science education and the positive attitudes that emerge from these perceptions.

Next, Bolat and Kıyak investigate middle school teachers' views on lifelong learning and adult education. Their findings emphasize the critical role of lifelong learning in personal and professional growth while addressing the barriers and inadequacies in current systems, particularly within the Turkish context.

Çatak and Konaklı contribute a compelling adaptation study of the Selection, Optimization, and Compensation Strategies Scale (SOCS) for Turkish educators. Their research underscores the significance of strategies that enable teachers to remain resilient and effective throughout their careers, reinforcing the importance of on-going professional development.

The fourth study by Nartgün and Kennedy provide an insightful exploration into the evolving dynamics of academic dishonesty in the age of artificial intelligence. This timely study draws attention to how technological advancements have reshaped cheating behaviours in higher education and underscores the need for innovative strategies to uphold academic integrity.

Finally, the study by Balogh investigates the adoption and integration of artificial intelligence (AI) within higher education. Through an extensive literature review and survey of university students, this research reveals both the opportunities and challenges posed by AI in educational settings. While students highlight the significant benefits of AI in enhancing accessibility and personalization, the study also draws attention to ethical concerns and the need for a balanced, human-centred approach to AI integration.

This issue represents the culmination of rigorous efforts by the authors, reviewers, and editorial team. We extend our deepest gratitude to the authors for their thoughtful and impactful contributions and to the reviewers for their meticulous evaluations and constructive feedback, which have significantly enhanced the quality of these studies. We also acknowledge the tireless dedication of our editorial team, whose hard work ensures the journal's continued excellence and relevance. As we navigate the ever-evolving landscape of lifelong education and leadership, we hope that the articles in this issue inspire meaningful discussions and further research. Thank you for your continued support of the International Journal on Lifelong Education and Leadership.

Sincerely,
Osman Titrek, Phd
Editor-in-Chief
International Journal on Lifelong Education and Leadership

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Metaphorical Perceptions of Gifted Students Towards the Phenomenon of Studying Science Lesson

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Abstract

This study aimed to examine the symbolic perceptions of gifted students toward studying science lessons. The study was conducted with 210 gifted students. In this study, the descriptive survey method was preferred since it was aimed to reveal the metaphorical perceptions of gifted students towards studying science lessons. "Metaphor data collection form" was used as a data collection tool in the study. The metaphor data collection form includes the phenomenon of "Studying science lessons". The form includes the following: "The phenomenon name (e.g., studying science) is like ..... Because....." In the study, content analysis was used to analyze student data. Gifted students developed a total of 129 metaphors, including 53 different metaphors for the phenomenon of studying science lessons. The phenomenon of studying science lessons was classified into 12 different categories. The categories with the most metaphors were "entertainment and science", respectively. In the study, the most developed metaphors for "studying science lessons" were "play, life, research, science, knowledge and nature" metaphors. In this study, it was determined that gifted students find studying science lessons very entertaining and have very positive perceptions about studying science lessons. The metaphorical perceptions of gifted students toward studying science are generally positive. The results can be compared, and the reasons can be emphasized by researching normal student groups. This study was conducted with gifted students studying at the primary school level. It can also be conducted on gifted students who continue their high school education. A scale for studying science lessons can be developed. It can be applied to different samples using different measurement tools for studying science lessons. The metaphors of gifted students about studying in different courses can be examined, comparisons can be made between courses, and negative perceptions and thoughts, if any, can be identified.

Keywords: Gifted student, metaphor, studying science lesson.

Introduction

The Ministry of National Education (2005) stated the vision of the Science and Technology curriculum as "All students, regardless of their differences, should be trained to acquire science and technology literacy." In the curriculum of the MNE (2015), science-literate individuals are stated to be the individuals who research, question, make decisions, have sustainable development awareness, solve problems, are confident, communicate effectively, collaborate, and are lifelong learners. Science-literate individuals refer to those who have positive behaviors, skills, understanding, and values related to science, as well as the necessary understanding and psychomotor skills in the parts of science related to the "technology-society-environment." When individuals are distributed according to their intelligence scores, 2% of the general distribution is considered gifted. Individuals who score 130 and above on valid and reliable tests are considered gifted. While numerical skills and reasoning, the ability to analyze, and quick comprehension are signs of superior intelligence, individuals who exhibit superior qualities in areas requiring performance, such as painting, music, and physical activity, are considered gifted (Özsoy et al. 1998). According to Ataman (2000), children who have very superior performance in terms of intelligence in one or more areas of ability

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compared to their peers or who have latent power but show normal level characteristics in other areas are called gifted children.

Gifted children have above-average ability and creative and critical thinking skills. In addition, they are individuals who have developed problem-solving skills, have a sense of responsibility, have stronger reasoning skills than their peers, and can solve problems and make plans (Altıntaş, 2009). Considering the educational needs of gifted students, it is necessary to prepare activities at their own level and cognition level. Instead of thinking of gifted students as "they have high capacity anyway, they will be successful somehow", these students should be educated in the direction of their abilities through programmed education (Gökdere et al. 2003). When measures are not taken for the education of gifted students, some problems arise (Özsoy et al. 1992). Motivational problems are one of the factors that gifted students may experience and may lead to unexpected failure (Reis & McCoach, 2000). Determining the reasons for unexpected failure in gifted students makes it important to research their perceptions of studying. Giftedness in science is defined as a special area of ability with high potential for scientific thinking and -level natural science skills (Heller, 1993). Yager (1989) defined the characteristics of giftedness in science as "a strong interest in objects and the environment, a high interest in researching scientific phenomena, a tendency to make observations and ask questions, an ability to establish relationships between scientific concepts and observed phenomena, an unusual ability to offer creative and topical explanations, and a high interest in collecting, sorting and classifying objects". While it is accepted that individual student work is important in the learning process, students' studying habits and related skills are also gaining importance. It is believed that studying skills acquired during the school period and turned into habits will affect success in the post-school period (Türkcan & Öcal, 2003).

Many students are not successful despite devoting most of their time to studying. Intelligence is necessary but not sufficient to be successful. One of the factors required for success is the knowledge of effective study techniques (Aydıner, 2004). In some cases, the fact that gifted students show success in inverse proportion to their potential is that they do not have the right studying habits. A child who attempts to produce something after wasting most of his/her time cannot naturally use his/her latent power (Davaslıgil, 1999). Some gifted students cannot develop studying habits because they succeed easily in primary and secondary school. When special talent and systematic studying habits are combined, superior success is achieved. The concept of metaphor comes from the Latin word metaphors. Metaphor, in essence, is the meaning and experience of one thing with another thing (Lakoff & Johnson, 1980). Metaphors are expressed as one of the most powerful mental tools that structure, guide, and control our thoughts about the formation and process of concepts, are effective in concretizing concepts, and provide communication (Guerrero & Villamil, 2002; Hogler et al., 2008; Shaw & Mahlios, 2011). Lakoff & Johnson (2010) express the importance of metaphors in our lives with the following words: "Metaphors are creative because they direct our minds beyond existing and obvious similarities, relationships and views to new similarities, relationships, and views of their creation. What kind of perception gifted students have about studying science lessons is a matter of curiosity.

An examination of the literature on metaphor reveals that there are metaphor studies on various concepts. Existing studies were generally conducted with pre-service teachers, teachers, or secondary school students (Saban, 2008; Soysal & Afacan, 2012; Kaya et al., 2013; Aktamış & Dönmez, 2016; Ekici, 2016). When the literature abroad is examined, it is seen that there are various studies on the image of science and scientists (Schibeci & Sorensen, 1983; Chambers, 1983; Newton & Newton, 1992; Huber & Barton, 1995; Barman, 1996; McDuffie, 2001; Garbett, 2003; Schibeci, 2006).

In the literature review, it was seen that studies were conducted to reveal the metaphorical perceptions of pre-service teachers and students in different branches towards the concept of science or various concepts related to science. In these studies, participants' metaphorical perceptions of concepts such as "science", "science and technology course", "science and technology teacher", "physics", "chemistry", and "science laboratory" were determined. When we analyzed these studies, it was seen that pre-service science teachers were the main group whose metaphorical perceptions of science or related concepts were investigated. In these studies, pre-service science teachers' metaphorical perceptions of the concept of "science" (Afacan, 2011; Evren Yapıcıoğlu & Korkmaz, 2019), the concept of "science and technology course" (Toplu, 2015), the concept of "science and technology teacher" (Afacan, 2011), the concept of "chemistry" (Anılan, 2017), the concept of "science laboratory" (Arık & Benli Özdemir, 2016; Ural et al. 2018) and the concept of "physics" (Demir & Demir, 2019) were tried to be determined. Other sample groups in which metaphorical perceptions of science and related concepts were investigated are secondary school students (Aktamış & Dönmez, 2016; Toplu, 2015), elementary school students (Soysal & Afacan, 2012), pre-service preschool teachers (Taş et al. 2020), pre-service mathematics teachers (Evren Yapıcıoğlu & Korkmaz, 2019) and pre-service classroom teachers (Demirci Güler, 2012).

There are not many studies conducted on primary school students in this field. One of the studies tried to determine the status of metaphors of primary school students concerning the concepts of "science and technology course" and "science and technology teacher" (Soysal & Afacan, 2012). In another study, Saban (2008) tried to determine the images that teachers and students at the first level of primary education have about the concept of knowledge through metaphors. Şenel and Aslan (2014) investigated the metaphorical perceptions of pre-service preschool teachers about the concepts of science and scientists. In another study, Saban (2008) tried to determine the images that teachers and students at the first level of primary education have about the concept of knowledge through metaphors. Şenel and Aslan (2014) investigated the metaphorical perceptions of pre-service preschool teachers about the concepts of science and scientist. Bıyıklı, et al. (2015) determined the metaphors produced by middle and high school students about the concept of science. When the literature is examined, it is seen that metaphor studies have been conducted with gifted students to determine the gifted students' perceptions of "social studies lesson" (Mertol et al., 2013; Ünal & Er, 2015), "values" (Kurnaz et al. 2013; Topçu, 2015), "future" (Yam et al. 2018), "bilsem-science and art center and school" (Aslan & Doğan, 2016; Kunt & Tortop, 2013; Su et al.2017), "school and teacher" (Ogurlu et al. 2015), "biology" (Özarslan, 2019), "mathematics" (Arıkan & Ünal, 2015), "leadership" (Demirçelik et al. 2017) and "project" concepts (Nacaroğlu & Mutlu, 2020). No study was found in which the perceptions of gifted students towards "science and studying" were revealed.

There are not many studies conducted on primary school students in this field. One of the studies tried to determine the status of metaphors of primary school students concerning the concepts of "science and technology course" and "science and technology teacher" (Soysal & Afacan, 2012). In another study, Saban (2008) tried to determine the images that teachers and students at the first level of primary education have about the concept of knowledge through metaphors. Şenel and Aslan (2014) investigated the metaphorical perceptions of pre-service preschool teachers about the concepts of science and scientist. In another study, Saban (2008) tried to determine the images that teachers and students at the first level of primary education have about the concept of knowledge through metaphors. Şenel and Aslan (2014) investigated the metaphorical perceptions of pre-service preschool teachers about the concepts of science and scientist. Bıyıklı et al. (2015) determined the metaphors produced by middle and high school students about the concept of science. With this study, it is important to reveal gifted students' positive or negative perspectives towards studying science lessons. The study's results are expected to contribute to taking necessary measures if there are negative perceptions towards studying science lesson. From this point of view, the problem sentence of this study can be stated as "What are the metaphorical perceptions of gifted students towards studying science lesson?"

Method

In this study, the descriptive survey method was preferred since it was aimed to reveal the metaphorical perceptions of gifted students towards studying science lesson. In education, a descriptive survey model is adopted to learn people's attitudes, opinions, and beliefs (Salaria, 2012).

Study Group

Convenience sampling was used in this study. Researchers may prefer individuals that they can reach more easily to make their studies easier and faster (Yıldırım & Şimşek, 2011). The study was carried out with a total of 210 gifted students, whose characteristics are given in Table 1, studying in the 3rd, 4th, 5th, 6th, 7th, and 8th grades of Alanya Science and Art Center affiliated with the Alanya District Directorate of National Education in Antalya in 2 weeks in the spring semester of the 2020-2021 academic year.

Table 1. Number of students in the study group

Group	Grade	Girl	Boy	Total
Support education	3rd Grade	21	25	46
	4th Grade	9	20	29
Recognizing individual talents	5th Grade	41	39	80
	6th Grade	22	15	37
Developing special skills	7th Grade	5	6	11
	8th Grade	2	5	7
Total				**210**

Application Process

The researcher provided the necessary information about the purpose of the application and how it would be conducted in all classes. The students were informed about the research by reading the metaphor information section in the metaphor data collection form.

Data Collection Tools

While developing the data collection tool used in the study, the data collection tools used in the studies conducted to reveal metaphorical perceptions in the literature were examined (Uygur & Yolçun, 2019; Epçaçan et al. 2020; Nacaroğlu & Mutlu, 2020), and it was seen to be "Concept or Phenomenon (for example, studying) is like ..... Because....." Since this study is about revealing metaphorical perceptions, a metaphor data collection form containing "studying science lesson.....Because....." was prepared.

Analysis of Data

Content analysis, one of the qualitative data analysis methods, was used to analyze the metaphors developed by gifted students for the phenomenon of studying science lesson. In content analysis, connections that can express the data can be reached. In content analysis, similar codes are combined, organized, and interpreted in common categories and themes (Yıldırım & Şimşek, 2011). In analyzing the metaphors developed by gifted students, a five-stage process was followed: "coding and sorting, sample metaphor image compilation, category development, ensuring validity and reliability, and quantitative data analysis" (Saban, 2009). *Coding and Sorting Phase:* Each student's data collection form was coded and numbered S-1, S-2, ... All of the metaphors produced by the students were coded in an Excel file, and an alphabetical list was created. *Sample Metaphor Image Compilation Phase:* After the sorting process, the metaphors were again arranged in alphabetical order , the raw data were reviewed a second time, and one sample metaphor statement was selected from the student sentences representing each metaphor. *Category Development Phase:* The metaphors developed by the students were combined in the same categories by bringing together similar answers. *Ensuring Validity and Reliability:* Since the phases of analyzing the data obtained in the study were explained in detail, study validity was ensured (Yıldırım & Şimşek, 2011). The reliability of the data analysis was calculated by using the formula [Agreement / (Agreement + Disagreement) x 100] proposed by Miles & Huberman (1994). In the metaphors in this study, the approximate reliability values between the researcher and the expert for each concept were determined in the range of 90 %. *Quantitative Data Analysis Phase:* For the phenomenon examined in this study, a frequency table was made for all data representing the metaphors and categories produced.

Findings

In this section, the metaphors created by gifted students about the phenomenon of "studying science lesson" and the categories that these metaphors are combined according to their similarities are shown as a frequency table.

Science and Art Center Students' Metaphors Related to the Phenomenon of "Studying Science Lesson"

Science and Art Center students participating in this study expressed the phenomenon of "studying science lesson" with a total of 129 metaphors, including 53 different metaphors. The data related to these metaphors are shown in Table 2.

Table 2. Student metaphors for the phenomenon of "studying science lesson"

Metaphor	Frequency	Metaphor	Frequency
Play	23	Dream	1
Life	13	Family	1
Research	6	Human	1
Science	6	Road	1
Information	5	Step	1
Nature	5	Patience	1
Reading a book	4	Travel	1

Amusement Park	4	Traveling	1
Party	3	Growing up	1
Beautiful	3	Labyrinth	1
Space	3	Ice cream	1
School	3	Orange	1
Scientist	3	Core	1
Chocolate	3	Diver	1
Playground	2	Recognizing the world	1
Being a professor	2	Knowing everything	1
Boring	2	Being aware	1
Teacher	2	Bee	1
Traveler	2	Plant	1
Reading a book	2	Bird Bird	1
Swimming	1	Wearing a mask	1
Phone	1	Going to Heaven	1
Television	1	Shining light into the darkness	1
Sense organs	1	Planet	1
Sound	1	Sun	1
Searching on the internet	1	Understanding how substance is	1
Distinctive properties of substances	1	Total	53

Categories of Metaphors Related to the Phenomenon of Studying Science Lesson

In the study, the metaphors produced by Science and Art Center students for the phenomenon of "studying science lesson" were combined into twelve different categories as " Entertainment ", "Science", "Emotion", "Place", "Human", " Achieving the goal", "Food", "Curiosity", "Living Creature", "Boring", "Hope" and "Sky" according to their common characteristics. The frequencies of the categories are shown in Table 3.

Table 3. Categories of metaphors related to the phenomenon of studying science lesson

Categories	**Frequency**
Entertainment	35
Science	28
Emotion	19
Place	11
Human	7
Achieving the goal	7
Food	6
Curiosity	6
Living Creature	3
Boring	3
Hope	2
Sky	2
Total	129

When Table 3 is examined, it is seen that the category with the highest number of metaphors in the category distribution of metaphors related to the phenomenon of "studying science lesson" is "Entertainment" (f=35). In the "Entertainment" category, there are a total of 35 metaphors with seven different categories shown in Table 4: "game (23), amusement park (4), party (3), playground (2), swimming (1), telephone (1) and television (1)".

Table 4. Student metaphors related to the category of "Entertainment."

Categories	**Metaphors and their numbers**	**Frequency (f)**
	Game	23

Entertainment	Amusement Park	4
	Party	3
	Playground	2
	Swimming	1
	Phone	1
	Television	1
	Total (7)	***35***

The metaphors developed by some students in the entertainment category and their justifications are given below. *S46: "Studying science lessons is like playing a game. Because we can learn by having fun.", S106 ""Studying science lessons is like an amusement park. Because learning new information is like riding a new amusement park ride. Because learning new information is like riding a bike in a new amusement park. S106: ". Because studying science lesson is like going to a party.", S156: "Studying science lesson is like a playground. Because playgrounds are very entertaining, I think science is also very entertaining.", S95: "Studying science lesson is like swimming. Because you swim in a lot of information.", S207: "Studying science lesson is like a telephone. Because I have fun both on the phone and in science class.", S17: "Studying science lesson is like watching television. Because it is enjoyable."* When Table 3 is examined, it is seen that the second category in the category distribution of metaphors belonging to the phenomenon of "studying science lesson" is "Science" (f=28). In the science category, there are a total of 28 metaphors with 10 different categories shown in Table 5: "research (6), science (6), information (5), reading a book (4), being a professor (2), sense organs (1), sound (1), knowing everything (1), distinctive properties of substances (1) and understanding how substance is (1)".

Table 5. Student metaphors related to "science" category

Categories	Metaphors and their numbers	Frequency (f)
Science	Research	6
	Science	6
	Information	5
	Reading a book	4
	Being a professor	2
	Sense organs	1
	Sound	1
	Knowing everything	1
	Distinctive properties of substances	1
	Understanding how substance is	1
	Total (10)	***28***

The metaphors developed by some students in the science category and their justifications are given below. *S38: "Studying science lesson is like research. Because science lesson is to leave your work to the results of research, not to chance.", S48: "Studying science lesson is like research. Because we research while studying science lesson.", S43: "Studying science lesson is like science. Because without science, there would be no science lesson.", S133: "Studying science lesson is like information. Because we get a lot of new information.", S136: "Studying science lesson is like reading a book. Because books teach us something.", S174: "Studying science lesson is like being a professor. Because it is very important to think while studying science lesson.", S122: "Studying science lesson is like sensory organs. Because science explains these things.", S122: "Studying science lesson is like sound. Because we always study sound channels in science lessons.", S49: "Studying science lesson is like knowing everything. Because it tells you everything." S190: "Studying science lesson is like the distinctive properties of substances. Because it is the subject of science." S189: "Studying science lesson is like understanding how the substance is. Because in science we examine what everything is."* When Table 3 was examined, it was seen that the third category in the category distribution of metaphors related to the phenomenon of "studying science lesson" was "emotion" (f=19). In the emotion category, there are a total of 19 metaphors with 4 different categories shown in Table 6: "life (13), beautiful (3), boring (2), and dream (1)".

Table 6. Student metaphors related to the "emotion" category

Categories	Metaphors and their numbers	Frequency (f)
Emotion	Life	13
	Beautiful	3

	Boring	2
	Dream	1
	Total (4)	***19***

The metaphors developed by some students in the emotion category and their justifications are given below. *S32: "Studying science lesson is like life. Because we learn information about our life and living.", S19: "Studying science lesson is like life. Because we discover the substances and beings in life with science lessons.", S37: "Studying science lesson is like beauty. Because we understand why the things we call beautiful are beautiful.", S120: "Studying science lesson is like beauty. Because science lesson is very beautiful. ", S169: "Studying science lesson is boring. Because people do not like to study a lot.", S87: "Studying science lesson is boring. Because I don't like science lessons at school, I like Bilsem because it is full of activities.", S77: "Studying science lesson is like a dream. Because it is my favorite lesson."* When Table 3 was examined, it was seen that the fourth category in the category distribution of metaphors related to the phenomenon of "studying science lesson" was "Place" (f=11). In the place category, there are a total of 11 metaphors with 3 different categories shown in Table 7: "nature (5), space (3) and school (3)".

Table 7. Student metaphors related to the "place" category

Categories	Metaphors and their numbers	Frequency (f)
Place	Nature	5
	Space	3
	School	3
	Total (3)	***11***

The metaphors developed by some students in the place category and their justifications are given below. *S31: "Studying science lesson is like nature. Because we understand and discover nature as we get to know it.", S51: "Studying science lesson is like nature. Because in this lesson, we learn about human beings and their environment.", S191: "Studying science lesson is like space. Because we learn about space in science lesson.", S198: "Studying science lesson is like school. Because we work in science class and we work in school."* When Table 3 was examined, it was seen that the fifth category in the category distribution of metaphors related to the phenomenon of "studying science lesson" was "Human" (f=7). In the place category, there are a total of 7 metaphors with 4 different categories shown in Table 8: "scientist (3), teacher (2), family (1) and human (1)".

Table 8. Student metaphors related to the "human" category

Categories	Metaphors and their numbers	Frequency (f)
Human	Scientist	3
	Teacher	2
	Family	1
	Human	1
	Total (4)	***7***

The metaphors developed by some students in the human category and their justifications are given below. *S71: "Studying science lesson is like a scientist. Because we do research and experiment in science class, in short, we feel like a scientist.", S14: "Studying science lesson is like a teacher. Because it tells us the things in our lives.", S3: "Studying science lesson is like a family. Because science class helps us develop and so does the family.", S56: "Studying science lesson is like human. Because human beings are made up of science.* When Table 3 was examined, it was seen that the sixth category in the category distribution of metaphors related to the phenomenon of "studying science lesson" was "Achieving the goal" (f=7). In the place category, there are a total of 7 metaphors with 7 different categories shown in Table 9: "life (1), step (1), patience (1), travel (1), traveling (1), growing up (1) and labyrinth (1)".

Table 9. Student metaphors related to the "Achieving the goal" category

Categories	Metaphors and their numbers	Frequency (f)
Achieving the goal	Road	1
	Step	1
	Patience	1
	Travel	1
	Traveling	1

	Growing up	1
	Labyrinth	1
	Total (7)	***7***

The metaphors developed by some students in the achieving the goal category and their justifications are given below. *S24: "Studying science lesson is like life. Because science lesson is life itself.", S52: "Studying science lesson is like a step. Because when we study science lesson, we take a step towards success.", S154: "Studying science lesson is like patience. Because some experiments require patience.", S69: "Studying science lesson is like travel. Because we learn as we travel, see, hear and live.", S129: "Studying science lesson is like traveling. Because when we study science lesson, we learn new things and we want to do more research.", S164: "Studying science lesson is like growing up. Because you constantly learn new things.", S82 "Studying science lesson is like a labyrinth. Because if there is a mistake somewhere, you cannot reach the result, but if you do not give up and change your path, you will eventually succeed."* When Table 3 was examined, it was seen that the seventh category in the category distribution of metaphors related to the phenomenon of "studying science lesson" was "Food" (f=6). In the food category, there are a total of 10 metaphors with 4 different categories shown in Table 10: "chocolate (3), ice cream (1), orange (1) and seeds (1)."

Table 10. Student metaphors related to the "Food" category

Categories	**Metaphors and their numbers**	**Frequency (f)**
Food	Chocolate	3
	Ice Cream	1
	Orange	1
	Seeds	1
	Total (4)	***6***

The metaphors developed by some students in the food category and their justifications are given below. *S71: "Studying science lesson is like chocolate. Because it gives people happiness.", S178: "Studying science lesson is like an orange. Because I like both doing science lessons and eating oranges.", S73: "Studying science lesson is like eating seeds. Because I like studying science lesson, I feel like doing it more and more."* When Table 3 was examined, it was seen that the eighth category in the category distribution of metaphors related to "studying science lesson" was "curiosity ". In the curiosity category, there are a total of 6 metaphors with 5 different categories shown in Table 11: "traveler (2), diver (1), getting to know the world (1), searching on the internet (1), and being aware.

Table 11. Student metaphors related to the "Curiosity" category

Categories	**Metaphors and their numbers**	**Frequency (f)**
Curiosity	Traveler	2
	Diver	1
	Getting to know the world	1
	Searching on the internet	1
	Being aware	1
	Total (5)	***6***

The metaphors developed by some students in the curiosity category and their justifications are given below. *S137: "Studying science lesson is like a traveler. Because you discover new things.", S58: "Studying science lesson is like a diver. Because each time you dive deeper and get new information.", S4: "Studying science lesson is like getting to know the world. Because we learn everything about the world in the lesson.", S93: "Studying science lesson is like searching on the internet. Because you always learn new things.", S86: "Studying science lesson is like being aware. Because even if you know what is going on in the environment, you learn the details of it, and if you don't know, you want to take a closer look and feel curious."* When Table 3 was examined, it was seen that the ninth category in the category distribution of metaphors related to the phenomenon of "studying science lesson" was "living creature". In the living creature category, there are a total of 3 metaphors with three different categories shown in Table 12: "bee (1), plant (1) and bird (1)".

Table 12. Student metaphors related to the "Living Creature" category

Categories	**Metaphors and their numbers**	**Frequency (f)**
Living creature	Bee	1
	Plant	1

	Bird	1
	Total (3)	***3***

The metaphors developed by some students in the living creature category and their justifications are given below. *S26: "Studying science lesson is like a bee. Because bees work with flowers to obtain honey and pollen to make them better.", S2: "Studying science lesson is like a plant. Because it is good for people and ourselves.", S193: "Studying science lesson is like a bird. Because each species has a different feature and beauty."* When Table 3 was examined, it was seen that the tenth category in the category distribution of metaphors related to the phenomenon of "studying science lesson" was "boring"(f=3). In the boring category, there are a total of 2 metaphors with two different categories shown in Table 12: "reading a book (2) and wearing a mask (1)".

Table 12. Student metaphors related to the "Boring" category

Categories	Metaphors and their numbers	Frequency (f)
	Reading a book	2
Boring	Wearing a mask	1
	Total (2)	***3***

The metaphors developed by some students in the boring category and their justifications are given below. *S34: "Studying science lessons is like reading a book. Because studying science lessons can sometimes be boring and sometimes entertaining, like reading a book.", S208: "Studying science lessons is like wearing a mask. Because wearing a mask is boring, like studying."* When Table 3 was examined, it was seen that the eleventh category in the category distribution of metaphors related to the phenomenon of "studying science lesson" was "Hope"(f=2). In the hope category, there are a total of 2 metaphors with 2 different categories shown in Table 13: “shining light into the darkness (1) and going to heaven (1)”.

Table 13. Student metaphors related to the "Hope" category

Categories	Metaphors and their numbers	Frequency (f)
	Going to heaven	1
Hope	Shining light into the darkness	1
	Total (2)	***2***

The metaphors developed by some students in the hope category and their justifications are given below. *S50: "Studying science lessons is like shining light into the darkness because it allows us to research and learn the unknown." S91: "Studying science lessons is like going to heaven. Because I love science lesson."* In Table 3, it was seen that the twelfth category in the category distribution of metaphors related to the phenomenon of "studying science lesson" was "Sky"(f=2). In the sky category, there are a total of 2 metaphors with 2 different categories shown in Table 14: "planet (1) and sun (1)".

Table 14. Student metaphors related to "Sky" category

Categories	Metaphors and their numbers	Frequency (f)
Sky	Planet	1
	Sun	1
	Total (2)	***2***

The metaphors developed by some students in the sky category and their justifications are given below. *S116: "Studying science lesson is like a planet. Because we learn about the planets.", S94: "Studying science lesson is like the sun. Because they both enlighten us.*

Discussions and Conclusions

Gifted students developed 129 metaphors with 53 different metaphors about the phenomenon of studying science lesson. There are scientific studies on "science lesson" and "studying" in the literature. In this context, the results of the studies examining the metaphorical perceptions of students towards the phenomena of "science lesson" and "studying" in the literature were examined. In this study, the most frequently developed metaphors for "studying science lesson" were "play, life, research, science, information and nature" metaphors.

The results of this study are similar to some studies conducted in the literature to reveal metaphorical perceptions. In the study of Kalaycı (2018), 3rd and 4th-grade elementary school students used metaphors

belonging to the categories of "informative", "descriptive" and "entertaining" regarding the phenomena of "science" and "science lesson". While 3rd grade students mostly compared the science lesson to "science", "information," and "life" metaphors, 4th-grade students compared it to "science", "information" and "life" metaphors. Some of the metaphors reached by Kalaycı (2018) and the "science, information, entertainment and life" metaphors produced by gifted students in this study are compatible. In this study, it was observed that the metaphors such as "information, play, amusement park, playground, scientist and book" produced by the students for the phenomenon of studying science lesson matched with the metaphors such as "information, play, riddle, amusement park, scientist and book" produced by primary school students for the phenomena of "science and technology lesson" and "science and technology teacher" in Soysal & Afacan's (2012) study. When the explanations of the metaphors produced by the gifted students in the study were examined, they stated that studying science lesson was entertaining and that it was in life. In Bartoszeck & Bartoszeck's (2017) study, it was also found that primary and secondary school students found science lessons entertaining and made statements expressing that the concept of science has an important place in people's lives. In this study, it was seen that the "life" metaphor produced by the gifted students was supported by the "life" metaphor produced by the pre-service teachers in the study of Palic Sadoğlu & Durukan (2018) regarding the phenomena of science lesson, science laboratory, science teacher and science student. In this study, it was seen that metaphors such as "life and science" produced by gifted students were supported by metaphors such as "life and doing science" produced by pre-service teachers in Önal & Kızılay's (2017) study in which mental perceptions about science and technology lesson were determined through metaphors. Similarly, in the study of Aktamış & Dönmez (2016), it was seen that middle school students mostly produced metaphors such as "science, experiment, and life" for the phenomenon of "science lesson".

In Gökbulak, Uzun & Şenler's (2020) study, the category of "entertainment environment" among the metaphors produced by pre-service primary school teachers about the phenomenon of "science laboratory" and the category of "entertainment" in this study are similar. In the study of Ural & Başaran Uğur (2018), the "playground" metaphor among the metaphors created by prospective classroom and science teachers about the phenomenon of "science laboratory" and the "amusement park and playground" metaphors produced by gifted students in the study are similar. In the study of Arık & Benli Özdemir (2015), the metaphor of "playground" among the metaphors produced by pre-service science and technology teachers about "science laboratory" and the metaphor of "playground" produced by gifted students in this study are similar. In the study of Akarçay, Demirezen & Akhan's (2013), the "bee" metaphor produced by the students in the findings of the research question "Which metaphors have primary school students developed about regular studying?" is the same as the "bee" metaphor produced by gifted students in this study. In the study, it was seen that the metaphors of "nature, human, research and science" produced by gifted students were in line with the objectives of "exploring nature, understanding the relationship between human-environment and scientific research approach", which are among the main objectives of the Science Curriculum of the MNE (2018), which aims to raise individuals as science literate. The metaphors such as, "information, scientist, being a professor and knowing everything" produced by gifted students match with the objectives of "helping to understand how scientific knowledge is created by scientists, the processes that this knowledge goes through and how it is used in new researches", which are among the main objectives of the Science Curriculum. Metaphors such as "traveler, diver, getting to know the world, searching on the internet and being aware" produced by gifted students in the category of curiosity support the objectives of "arousing interest and curiosity about the events occurring in nature and its immediate surroundings and developing attitudes", which are among the main objectives of the Science Curriculum. In addition, the goal of "gaining basic knowledge about astronomy", which is among the main objectives of the Science Curriculum, is compatible with the "space, planet, and sun" metaphors produced by gifted students.

Consequently, analyzing the metaphors produced by gifted students for the phenomenon of studying science and the categories they were related to, it was determined that there was no negative perception towards studying science except for the students who stated that studying science was boring in 3 metaphors out of 129 metaphors produced in total. Gifted students produced different metaphors about the phenomenon of studying science lesson. Gifted students produced different metaphors about the phenomenon of studying science lesson. Revealing various dimensions of a phenomenon can only be possible by producing a large number of metaphors about it (Yob, 2003). This study revealed the phenomenon of gifted students studying science lesson by gifted students with different dimensions and characteristics. Each metaphor produced by the study participants indicates that they have different understandings (Cerit, 2008).

The research results indicated that gifted students generally associate studying science with researching, exploring, learning the functioning of the world, learning by doing and experiencing, using scientific process steps, and being science literate. In the study, gifted students expressed the phenomenon of studying science

with the dimension of learning science rather than studying. The possible reason for this situation may be that gifted students do not have difficulty studying science. In the study, one of the students (*S157) stated, " Studying science lessons is like ice cream. This is because it ends immediately."* In his book, Berger (1991) stated that gifted students do not need to learn time management and effective study methods because school is very easy for them until the 7th grade (and maybe higher). In previous studies, it was detected that there was no relationship between gifted students' study habits and their achievement in science lessons (Bayır, 2015; Çetin, 2023). The fact that gifted students have study habits since they like science lessons was shown as the reason for this result (Bayır, 2015). Çalıkoğlu (2009) stated that gifted students can successfully perform the learning or tasks required of them with little effort due to their high sense of self and self-confidence, and attributed this to the fact that they are aware of their abilities from an early age and have no experience of failure. In the research results, gifted students associated studying science with "doing research". *S48 said, "Studying science is like doing research because we research while studying science."* and likened studying science to doing scientific research. Student *S129 said, "Studying science lessons is like traveling because when we study science lessons, we learn new things and we want to do more research."* and *S50: "Studying science is like shining a light in the darkness because it allows us to research and learn the unknown."* They emphasized that researching while studying science teaches them new things. Russell and Martin (2023) stated that the main goal of science lessons is to raise individuals who research, not memorize, science concepts.

In the research findings, gifted students associated studying science with "learning everything". Explaining this situation, one of the students (*S49) said, "Studying science is like knowing everything, because it tells you everything."* and emphasized the relationship between studying science and "scientific literacy". Science literacy is the ability of every citizen in society to understand and explain some scientific concepts and phenomena at the most basic level (Kaya & Bacanak, 2013). One of the students *(S4) said, "Studying science is like getting to know the world, because we learn everything about the world in the lesson."* He drew attention to the fact that studying science lessons allows us to get to know the world we live in. In the literature, science is defined as a science that explains the world and enables students to examine, learn and understand the natural world (Irez, 2006). In the research results, gifted students associated studying science with "scientific process skills". One of the students (*S38) said, "Studying science is like doing research because studying science lesson is not leaving the work to chance, but to the results of research." He emphasized "concluding"* in causal processes, which is one of the dimensions of scientific process skills. One of the students (*S154) said, "Studying science is like patience because some experiments require patience."* and emphasized "experimenting" in experimental processes, which is one of the dimensions of scientific process skills. One of the students (*S82) stated, "Studying science lessons is like a maze because if there is a mistake somewhere, you cannot reach the result, but if you do not give up and change your path, you will eventually find success."* He explained the study of science lesson very effectively by emphasizing "changing and controlling variables", which is one of the dimensions of scientific process skills.

In the research findings, gifted students associated studying science with "scientist". One of the students (*S71) said, "Studying science lessons is like being a scientist because we do research and experiment in science class, in short, we feel like scientists."* and *(S174), "Studying science class is like being a professor because it is very important to think while studying science"* and (S174) stated that studying science enabled them to think like a scientist. A scientist is a person who tries to obtain information systematically by using scientific methods of obtaining data about phenomena and variables related to the universe. In the research findings, gifted students associated studying science with "science". One of the students *(S43) said, "Studying science is like scholarship because without science, there would be no science lesson."* He pointed out that science is a part of science, but not all science is science. In the research findings, gifted students associated studying science with "learning by doing and experiencing". One of the students *(S69) said, "Studying science is like traveling because we learn as we travel, see, hear, and live."* He stated that studying science lessons involves learning by doing and experiencing. Since education is a lifelong activity, learning emerges through doing and experiencing (Bender, 2005).

In the research results, gifted students associated studying science with "curiosity". One of the students (*S86) said, "Studying science is like realizing because even if you know what is happening in the environment, you learn the details, and if you don't know, you want to take a closer look and feel curiosity."* Thus, he emphasized that studying science lessons activates a sense of curiosity in them. In Mecek's (2017) study with gifted students, one of the students shared his thoughts with the statement, *"I cannot understand why we look at the blackboard when my teacher talks about ferns in science class. I am curious about ferns because I don't know them, and I am asking you. I would like to touch this fern and inhale its smell if I could"*. In the research results, gifted students associated studying science with "being successful".One of the students (*S3) said, "Studying science is like a family, because science class helps us develop, and so does the family."* So, he emphasized that studying science would bring them success. Families play an important role in

preparing the appropriate environment for study, providing the necessary materials, and supporting the student morally (Eren, 2011). It is stated that there is a positive relationship between family and teacher support variables and academic achievement (Türkoğlu et al. 2011). One of the students (*S52) emphasized that studying science would lead to success by saying, "Studying science lessons is like a step because when we study science, we take a step towards success."*

In the research results, some gifted students associated studying science lessons with " boring". One of the students *(S87) emphasized that studying science lessons is more fun when there are activities by saying, "Studying science lessons is like being boring, I don't like science lessons at school, but I like BİLSEM. It is full of activities."* Yılmaz and Çaylak (2009), in their study on BİLSEM students, stated that the majority of the parents of the students stated that BİLSEM contributed positively to the science achievement of the students (*there are activities in BİLSEM)*.

Recommendations

The metaphorical perceptions of gifted students toward studying science are generally positive. The results can be compared, and the reasons can be emphasized by researching normal student groups. This study was conducted with gifted students studying at the primary school level. It can also be conducted on gifted students who continue their high school education. A scale for studying science lessons can be developed. It can be applied to different samples using different measurement tools for studying science lessons. The metaphors of gifted students about studying in different courses can be examined, comparisons can be made between courses, and negative perceptions and thoughts, if any, can be identified.

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How Do Teachers Perceive Lifelong Learning and Adult Education?

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Abstract

The objective of this study is to explore the perspectives of middle school teachers on the concepts of lifelong learning and adult education. The qualitative research involved 25 middle school teachers, and their responses, gathered through semi-structured interviews, underwent content analysis. Thematic analysis was employed to derive the results. The findings underscore that teachers attribute value to lifelong learning and adult education for various purposes, such as personal development, adaptation to evolving times, sustained learning, quality time utilization, social integration, and meeting educational needs. A consensus within the study group indicates that individuals across professions should engage in lifelong learning beyond their initial undergraduate education. The research reveals that continuous lifelong learning among teachers positively impacts performance, fostering open-mindedness, cultivating versatile thinking, facilitating effective lesson delivery, and improving interaction with students. Identified factors hindering lifelong learning include physical and economic conditions, environmental factors, health issues, motivation, and the repercussions of disasters. Teachers have been found to perceive the lifelong learning and adult education activities offered in Turkey as inadequate. Additionally, teacher opinions shed light on shortcomings in lifelong learning and adult education within the Turkish context. Lastly, the study observes a general lack of adequate knowledge among teachers regarding global lifelong learning and adult education activities.

Key words: Lifelong learning, non-formal education, adult education, vocational and technical education, teacher perspectives.

Introduction

Educational systems are undergoing rapid changes in the face of a globalized world (Çalık & Sezgin, 2005). To keep pace with the dynamic changes in the world, individuals must commit to ongoing self-development throughout their entire lives (Laal et al., 2014). Alternatively, those aiming to acclimate to change ought to prioritize perpetual self-enhancement across their lifetimes, steering away from restricting themselves solely to formal educational avenues (Allmendinger et al., 2019). In this context, lifelong learning can be defined as individuals constantly renewing themselves as a result of developments in society and all social areas that constitute it (Jarvis, 2007). Individuals who follow innovations in their lives and continually develop themselves are believed to integrate better into new situations (Laal, 2012). However, in a globalized society, individuals must closely follow developments to contribute continuously to their own development (Miser, 2002).

Based on comprehensive and lifelong learning approaches, adult education is a process that aims to support and empower individuals and local communities, encompassing the entire lifespan of an individual or individuals (Golding et al., 2008). Adults must continually develop themselves to secure better opportunities in their professional lives, improve working conditions, or advance in their careers (Karakoç, 2021). In our era and in the future, individuals who continuously develop themselves and can pursue lifelong education are the most sought-after type of people. lifelong learning is not just an activity for individuals to fill their leisure time effectively; it is an educational approach in which individuals continuously develop themselves from birth to the end of their lives (Aksoy, 2013). Within this framework, the significance of lifelong learning is growing steadily and is becoming more of a focus of interest for adults (Pata et al., 2021). The extent to which this focus, namely the concepts of lifelong

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learning and adult education, is known and embraced by teachers is becoming increasingly significant. Therefore, this study is based on the concepts of lifelong learning and adult education.

Lifelong Learning (LLL)

Individuals are in a constant pursuit of learning from birth until the moment of death. This quest for learning gives rise to the concept of lifelong learning (LLL). Introduced by Yeaxlee (1929), LLL has rapidly evolved within educational systems up to the present day. LLL encompasses a series of cultural processes wherein an individual continuously develops their knowledge, skills, and experiences, learning new things throughout their life, thereby enhancing the quality of life (Shokhida, 2016). These cultural activities, occurring both formally within schools under the name of formal education and informally outside of school settings, contribute to the enrichment of Lifelong Learning (Erden, 2009). However, it should be noted that the shortcomings of formal education can be addressed by the widespread opportunities provided by LLL activities, thus strengthening formal education (Bolat, 2017). LLL, not only embraces the philosophy of continuous learning at every stage of individuals' lives but is also recognized as a crucial educational strategy for sustainable development in the era of globalization (Webb et al., 2017). LLL serves as a fundamental key for individuals to enhance themselves, renew their knowledge and skills, explore new areas of interest, and progress professionally. Innovations in technology and information have brought about changes in educational systems from the perspective of LLL (Balcı, 2023). Recent technological developments have opened up new opportunities in the field of LLL (Şahin Kölemen, 2023). As a result, these learning activities have diversified, contributing to a more inclusive society.

The concept of LLL has been the subject of numerous discussions regarding its meaning, purpose, how it has become a prevalent concept in adult and continuous education, and its broader impact on the concepts of education and learning (Biesta, 2013). However, as the importance of the LLL concept continues to grow, it remains a supportive force in all areas of society, catering to individuals of all ages (Pata et al., 2021). People continue to learn even after formal education activities (Şahan & Yasa, 2017). In this context, the concept of adult education (AE) emerges as a solution to the ongoing need for learning. AE is one of the most important components related to the LLL concept.

LLL has become a significant driving force in the development of countries (Balcı, 2023). Education systems recognizing this force have started diversifying LLL opportunities for their citizens (Bolat, 2016). Realizing the importance and role of this process in development, the Turkish education system has accelerated the necessary efforts and initiated the implementation process. Despite the emphasis on formal education in Turkey, the importance of individuals continuing to learn throughout their lives, renewing themselves by following developments in their professions, and supporting adults in free and widespread learning has gained prominence. This situation has been substantiated in the legal dimension with a focus on LLL objectives in Article 40 of Law No. 1739 on National Education, laying the foundation for the concepts of "continuous education" and "education everywhere." In line with this legal dimension, LLL found its place in the Turkish education system with the establishment of the Directorate General for Lifelong Learning, providing a dedicated space for lifelong education in development plans (National Education Basic Law, 1973). Through the efforts of Public Education Centers, Vocational Training Centers, and Open Education Institutions, the number of courses offered is steadily increasing (Urhan, 2020; Karakuş Yıldız and Taş, 2023).

Municipalities encourage LLL within the education system by organizing vocational training courses, and adult education gains significant importance. These courses are popular among the community, with many individuals attending to obtain certificates and improve their professional skills, making them more employable. The knowledge and skills acquired through lifelong education play a crucial role in addressing employment and unemployment issues in the country. Furthermore, considering the Lifelong Learning Strategy Document and Action Plan for Turkey published by the Ministry of National Education (MoNE) in 2014, the increased awareness about LLL, the creation of a societal learning culture, the enhancement of access to learning, diversification of learning opportunities, and innovations in guidance, monitoring, and evaluation services indicate that policymakers have recognized the importance of this field.

In order to carry out LLL activities in the European Union, the European Commission has adopted a strategy encompassing learning activities and has set forth key messages. The focus of this strategy is to satisfy the requirements of the employment market and aim for the acquisition of essential skills. Technologically supported initiatives within this framework aim to facilitate access to education, enhance social cohesion, and develop citizenship awareness (European Commission, 2000). Simultaneously, the Council of Europe aims to enhance the quality of education systems to create a competitive and dynamic economy, reduce school dropout rates, and address gender imbalances. These efforts target prolonged

retention of employees in their jobs, the continuation of LLL activities, and an increase in investments in human resources (European Commission, 2005).

Adult Education (AE)

AE representing a significant variable in human life, stands as an essential element in the educational procedure. In addition to encompassing compulsory education, it includes widespread educational activities for individuals who have discontinued formal education for various reasons or have not received formal education (Vermeersch & Vandenbroucke, 2009). In this context, AE addresses a target audience. Various variables such as age, gender, education level, and the desire for learning contribute to the diversification of the target audience in AE. Thus, both LLL and AE have become increasingly crucial for the advancement of vocational and technical skills, as well as for enhancing certain professional competencies (Tut & Bolat, 2022).

AE has a broad target audience as it is directed towards individuals with diverse needs. AE is a unique educational journey integrated with and tailored to adults. Variables such as age, gender, education level, and the desire for learning can be considered in classifying the target audience. On the other hand, the expectations and requirements of various segments in society cover a diverse range of activities. The enrichment of adults' lives and the positive transformation of their knowledge, skills, lifestyles, and living conditions are intricately tied to the pivotal role of AE (Chang, 2020). Particularly, vocational and technical training in the field of AE has become a crucial area in some education systems, opening the way for individuals to acquire different professional competencies (Andersson & Muhrman, 2020).

The importance of AE is increasingly recognized due to issues such as natural disasters, pandemics, and climate change. Population movements caused by migration and wars, alongside natural population increases in some countries, impact the education policies of these countries (Başkan & Bars, 2020). AE becomes crucial in implementing these policies and organizing chaotic situations. This is because AE has a vital purpose of educating the adults in society to be able to solve the problems of the country and the community (Park, 2002). Moreover, developments in technology and science, occupational changes, and situations arising from economic conditions further emphasize the importance of AE.

Countries may have variations in AE due to their historical and unique situations. AE is closely related to culture and society. AE plays a crucial role in enabling disadvantaged segments of society to enter the labor market. The definition of AE can vary among individuals, institutions, and countries (Yiğit, 2022). Duman (2005) defines AE as activities specifically designed for adults that do not include professionalism. According to the UNESCO "*Glossary of Terms on Adult Education*," adult education includes regular educational activities geared towards elevating both knowledge and skills in adults, increasing their technical and vocational skills, and shaping their knowledge and skills in a modern way, without distinctions in level, content, and method. According to the OECD, AE encompasses programs and activities specifically arranged to address the learning requirements of individuals who are no longer attending school, having completed the compulsory school period, at any stage of their lives. AE aims to meet individuals' continuous learning needs and can help them adapt to the dynamics of modern societies and the business world (OECD, 2001).

In Turkey, AE programs can be classified by various institutions based on their functions. Private, civil, and public institutions in the country focus on AE and adult vocational and technical education as their primary functions (Tut & Bolat, 2022). The MoNE is one of the main institutions that forms the basis of formal education in the country. In addition to the MoNE AE can be carried out by various other institutions. Among these institutions are official, private, and voluntary organizations. Within the MoNE-affiliated institutions, the Directorate of Vocational and Technical Education, the Directorate of Lifelong Learning, and Public Education Centers are institutions that provide AE. Moreover, ministries, public institutions, municipalities, universities, voluntary organizations, ISMEK (Istanbul Metropolitan Municipality Art and Vocational Training Courses), professional institutions, and various other organizations also offer AE (Bacakoğlu, 2022).

LLL and AE for Teachers

Education is a lifelong process, and the role of teachers in this process is critically important (Shokhida, 2016). In this long-life cycle of educational processes, LLL and AE constitute an important part. LLL refers to the acquisition of knowledge, skills, and competencies necessary for individuals to sustain their personal, professional, and social development (Mystakidis et al., 2019; Pata et al., 2021). In this context, teachers are not only individuals who impart knowledge to students but also lifelong learners who continuously develop themselves and acquire new knowledge and skills. AE involves educational activities

organized to support the personal development of adult individuals, enhance their participation in social life, and contribute to their efficiency in professional life (Park, 2002). In this educational process, teachers' knowledge and experience, as well as their ability to use current educational approaches and technologies, are of great importance. AE enables individuals to advance in their careers, develop their personal interests, and fulfill their social responsibilities (Başkan & Bars, 2022).

AE and LLL enable individuals to become successful and fulfilled in both their personal and professional lives. In a rapidly changing world, staying competitive requires continually acquiring new knowledge and skills. Various methods and tools that support these processes can help individuals succeed on their lifelong learning journey. LLL and AE are not only important for students and adults but also for teachers. Teachers practice a profession that requires continuous self-improvement. Throughout their careers, teachers need to constantly acquire new knowledge and skills. Educational methods, technologies, and pedagogical approaches are rapidly changing. The digital revolution, representing the most significant educational transformation ever, underscores the essential need for digital competence in AE and LLL (Halemm et al., 2023). For teachers to keep up with these changes, they must adopt a LLL mindset. AE also encompasses an area where teachers can be involved both as instructors and as learners. Teachers can gain new knowledge within adult education and also provide education to adult learners. LLL and AE are crucial for teachers' personal and professional development.

Research Purpose

The significance of LLL and AE concepts is increasing day by day. In order to adapt to the changing and evolving world, it is crucial for all individuals to continuously improve themselves. Especially in shaping the future generation, it is essential for the educators, who mold the students, to constantly enhance their own skills. This research examines teachers' attitudes towards LLL and AE, the challenges they face, and the opportunities in this field. The aim of the study is to better understand the professional development processes of teachers and their contributions to AE and to provide recommendations for improvements in these areas. Enhancing the quality of education will positively impact the overall well-being of society and individuals' self-actualization levels. In this context, evaluating teachers' approaches to lifelong learning and adult education is also crucial for shaping educational policies. Thus, the research aims to explore the perspectives of teachers on the concepts of LLL and AE. Additionally, by formulating sub-aims, the research intends to contribute to shaping the research process.

1. Investigating participants' views on the necessity of AE and LLL.
2. Assessing the capacity of every profession or individual to continue LLL processes.
3. Investigating views on the sufficiency of undergraduate education for the teaching profession.
4. Determining the participants' involvement in continuous learning activities.
5. Examining the potential effects of teachers' participation in lifelong learning processes on their in-class performance.
6. Identifying and elaborating on the factors that hinder AE and LLL.
7. Investigating views on the sufficiency of AE and LLL activities conducted in Turkey.
8. Evaluating the participants' knowledge of AE and LLL activities worldwide.

Method

Research model

For this study, an approach rooted in qualitative research has been utilized, allowing for a detailed exploration of the subject at hand. Qualitative research involves the realistic portrayal of events in their natural environment, utilizing methods such as observation, interviews, and document analysis during the data collection process (Creswell, 2017). The research methodology employed in this study takes the form of a qualitative case study design, offering a nuanced exploration of the subject matter. Case studies aim to systematically gather information about how a limited system operates and functions, allowing for data collection through various methods to comprehensively examine different dimensions of the system (Chmiliar, 2010). This approach is designed to offer an in-depth examination of the existing conditions related to LLL and AE, bringing forth the comprehensive perspectives of participants.

The Study Group

The study group consists of 25 teachers working in middle school institutions affiliated with the MoNE in the Reyhanlı district of Hatay province. In the selection of the study group, a purposive sampling method was employed. According to this sampling, the researcher determines whom to interview based on their knowledge and experience. Purposive sampling allows the researcher to choose individuals or units with specific qualities or characteristics. Thus, the researcher can create a sample that is most suitable and informative for the objectives of the study. Purposive sampling is often preferred to gain in-depth understanding or examine the characteristics of a specific subgroup. It is used in situations where detailed investigation is required for topics with rich content. This type of sampling is frequently employed in qualitative research with small sample sizes, as researchers can obtain in-depth information by working closely with individuals who have expertise in a specific subject or belong to a specific subgroup (Yin, 2017).

The participants included in the research consist of 11 males and 14 females, with 5 in the age range of (20-25), 12 in the age range of (26-30), 5 in the age range of (31-35), and 3 in the age range of (36-40). Among the participating teachers, 2 are from the social studies department, 5 from Turkish, 3 from English, 2 from information technologies, 2 from religious culture and moral knowledge, 4 from mathematics, 2 from science, 1 guidance counselor, 1 from Arabic, 2 from preschool, and 1 from the music department. Detailed information about the study group is provided in Table 1.

Tablo 1. Participants

Participant	Age	Gender	Field
M1	27	Male	Social Studies
M2	37	Male	Turkish
M3	38	Male	Turkish
M4	28	Male	English
M5	32	Male	Information Technologies
M6	30	Male	English
M7	40	Male	Turkish
M8	32	Male	Social Studies
M9	25	Male	Religious Culture and Moral Knowledge
M10	29	Male	Mathematics
M11	35	Male	Information Technologies
F1	28	Female	Mathematics
F2	24	Female	Science
F3	25	Female	Religious Culture and Moral Knowledge
F4	27	Female	Guidance and Psychological Counseling
F5	30	Female	Arabic
F6	26	Female	Preschool
F7	26	Female	Mathematics
F8	30	Female	Turkish
F9	34	Female	English
F10	28	Female	Turkish
F11	32	Female	Music
F12	30	Female	Mathematics
F13	24	Female	Science
F14	25	Female	Preschool

Data Collection

The research process initially began with a comprehensive literature review. The researcher examined existing information on the topic, identified gaps in the literature, and reviewed findings from previous studies. Subsequently, to understand the perspectives of teachers on LLL and AE in middle school institutions affiliated with the MoNE, interviews were conducted with experts in the field. The insights

from these expert opinions assisted the researcher in determining the focal points of the research. Based on the information gathered, the researcher developed a semi-structured interview form to be used during discussions with middle school teachers. This form was shaped for use in interviews, conducted at a time convenient for each teacher and in an environment of their preference, providing a comfortable setting for the participants. During the interviews, teachers' statements were recorded using audio recording devices. This allowed for the direct recording of teachers' expressions, which were later used for analysis. Data were collected through face-to-face interviews with the participants. Before starting the interviews, participants' consent was obtained to ensure their voluntary participation. They were informed that they could withdraw from the interview at any time. Participants were assured that their information would only be used for scientific research and that the confidentiality of their data would be protected. The collected data was organized around the conducted interviews, leading to the overall findings of the research. This stage laid a solid foundation for understanding teachers' perspectives on LLL and AE. For his purpose, the following questions have been asked to the participants.

1. What are your thoughts on the necessity of AE and LLL?
2. Can every profession or individual continue LLL processes?
3. Do you consider the undergraduate education sufficient for the teaching profession?
4. Are you currently engaged in continuous learning? (e.g., pursuing a master's degree, attending courses, etc.)
5. What could be the impact of a teacher participating in LLL processes on their in-class performance?
6. Are there factors that hinder AE and LLL? Please elaborate.
7. Do you find the activities related to AE and LLL in Turkey sufficient?
8. Are you knowledgeable about the activities related to AE and LLL worldwide?

Data Analysis

In the data analysis phase, primary themes were identified based on the interview form questions. Content analysis was utilized to generate codes from data collected from diverse sources. This method facilitated the classification, correlation, and comparison of the data (Fraenkel & Wallen, 2000). Content analysis, frequently used in qualitative research, is defined as a research method approach that contributes to the formation of common research criteria for qualitative studies (Mayring, 2015). The data collected from participants were transferred to a computer environment for data mining after a preliminary control process, and then specific codes were created for each question and organized accordingly. These codes were subsequently grouped to form themes by bringing together those with similar topics. The content analysis processes used in scientific research are based on the stages proposed by Hsieh and Shannon (2005). These stages are as follows:

Coding of the Data: The data in the interview records were initially coded by identifying meaningful components and creating unique codes for each. In this stage, significant elements within the data were identified, and specific codes were assigned to each.

Identification of Themes: The created codes were grouped based on similarities to obtain themes. This stage was conducted to understand relationships between codes and determine overarching themes.

Placement and Definition of Codes in Themes: Codes and themes were used to organize and explain the data. In other words, it was determined which theme each code represented, and the data were organized accordingly. This step aimed to add more meaning to the analysis process.

Interpretation of Findings: Themes and codes obtained were interpreted and conclusions were drawn based on the research questions and objectives. This stage aimed to add meaning to the analysis results and outline the overall framework of the research. The application of these processes allowed for the systematic examination and interpretation of data obtained from the research. The themes and codes obtained were used to understand the main findings of the research and provide a scientific content analysis.

Validity and Reliability

The process of ensuring the validity and reliability of the research involved a carefully planned series of steps. Initially, the significance and purpose of the study were clearly defined. Sub-objectives were identified in line with the main objective, and these sub-objectives were designed to be consistent with the research topic. During the data collection phase, a focus on the principles of validity and reliability led to a thorough review of relevant sources. Previous studies that determined the scope of this research were examined in detail. Detailed explanations related to the subject were presented, and the obtained data were gradually presented to contribute to a more comprehensive understanding of the research process for readers. The data collected for the research were thoroughly examined using open coding and content analysis methods. Analyses were conducted considering the criteria for descriptive, interpretive, and theoretical validity proposed by Sandelowski and Barroso (2007). In order to establish the research's validity, the analysis process began with accurate definition of the study, and analyses were conducted to ensure the researcher's common interpretation of the data. To further ensure validity and reliability, triangulation methods were employed, involving multiple data sources and methods to cross-verify findings. Additionally, peer debriefing sessions and member checks were conducted to confirm the accuracy and consistency of the interpretations. These steps were taken to minimize biases and enhance the credibility of the research findings.

The analysis procedure was conducted within the framework of accordance with the main purpose to establish the theoretical validity of the research. In order to protect the identities of participants, interview records were coded with "F" for females and "M" for males, and measures were taken during the analysis process to prevent identity disclosure. Given that both researchers and participants were earthquake survivors, an independent supervisory expert reviewed the analyses to ensure reliability. Participants were not pressured with questions to ensure their comfort, and interviews were concluded at the participants' request. Special attention was given to avoid data loss throughout the analysis process, and the data were collected with meticulous care. Tables were used in the presentation of findings to support numerical data.

Findings

Regarding the necessity of AE and LLL

The 25 teachers interviewed were asked about the necessity of AE and LLL. The analysis of the responses obtained is presented in Table 2, summarizing the findings.

Table 2. Reasons for the necessity of AE and LLL

Code	Participants	%	f
Personal development	M4, M9, F2, F5, F6, F8	24	6
Continuous learning	M2, M5, M7, F3, F7	20	5
Adaptation to society	M1, M6, M8, M11	16	4
Adapting to the changing and evolving era	F1, F4, F12, F14	16	4
Educational need	M3, M10, F10	8	3
Quality time	F9, F11	8	2
Developing social relationships	F13	4	1

When Table 2 is examined, firstly, 6 individuals find adult education and lifelong learning necessary for personal development, 4 individuals for adapting to the changing and evolving era, 5 individuals for demonstrating continuous learning, 2 individuals for spending quality time, 3 individuals for educational need, 4 individuals for adaptation to society, and 1 individual for developing social relationships. Among the teachers who find AE and LLL necessary for personal development, one of them is at the forefront;

"*While one teacher says, 'I believe lifelong learning is necessary because humans are open to learning and development throughout their lives*" (F5), the other says; *"Learning something is of great importance for individuals to improve themselves"* (F6).

In the second place, the purpose of adapting to the changing and evolving era is mentioned. In this regard, a teacher expressed; "*Expressing the viewpoint, 'It is important to adapt to the changing and evolving era*" (F4), another opinion is stated as continuous learning. In another perspective, learning is expressed as showing continuity.

A teacher stated, "*According to our belief, knowledge is obligatory for every believer from the cradle to the grave. Education starts from the mother's womb and continues until adulthood and even until death. The cornerstone is that learning should be intertwined with education throughout our lives*." (M2).

Another teacher stated, "*Education and lifelong learning should be among the top priorities in the list of needs that a person requires from birth to death. Without education, being morally upright is not possible without knowledge*" (M7).

In another deduction, it is mentioned as a quality time, and a teacher expressed his opinion by saying, *"I think it is necessary. However, these educations need to be of high quality. They should not waste the teacher's time*" (F9). One of the teachers expressing the view of adapting to society stated, "*LLL is crucial for individuals to adapt to society and control their lives*." (M6).

In the last deduction, a teacher stated, "*AE is necessary for people in all stages of life. Education is a mandatory need for all individuals from the moment they are born. People learn to live through education. If they continue to receive education in their later lives, their lives become better and easier."* (F10).

A teacher who says it develops social relationships stated, "*AE and LLL are extremely important. Because here, adults can develop their social relationships by using the skills they will acquire. They can collaborate, manage conflicts, and solve problems*." (F13).

When the thoughts of teachers about the necessity of adult education and lifelong learning are generally evaluated, it is understood that teachers' opinions are related to personal development, adapting to the changing and developing era, the continuity of learning, spending quality time, adapting to society, meeting the need for education, and developing social relationships.

The continuation of LLL processes for every profession or individual

Table 3. The continuation of LLL processes for every profession or individual

Impact	Participants	%	f
Can continue	F1, F2, F3, F4, F5, F6, F7, F8, F9, F10, F11, M1, M2, M3, M6, M8, M9, M10, M11, M12, M11, M14	88	22
Can't continue	M4, M5, M7	12	3

When examining the data in Table 3, it is stated that 22 teachers responded as "*can continue*," while 3 teachers responded as "*cannot continue*." A teacher who believes that every profession or individual can continue lifelong learning states, "*Since new developments occur over time in human life and in every profession, individuals can continue LLL to adapt to these developments*" (M1).

Another teacher expresses a similar view, saying, "*Yes. The evolving world and changing societal needs make the continuity of education mandatory. Those who think they have had enough education and do not keep up with developments fall behind*" (F5).

Another teacher remarks, "*School is not a framework for LLL. It can occur at every stage of life. Therefore, LLL continues in any field or any profession where people are together with society, regardless of age or location*" (F13).

Another teacher states, "*Absolutely, they can continue. Because a teacher has no age, time, or place. A person should be able to learn any kind of novelty that interests them in any field at any time without being bound by a rule or time*" (F9). Another teacher expresses, "*Yes, they can continue. Nothing in the world remains unchanged. Every person cannot fully learn everything, and our brains sometimes even forget what we have learned. With advancing technology, every profession must develop itself in this direction. For example, advancing automotive technology requires even automotive repairs to know languages and be able to use computers due to globalization*" (F10).

Although their numbers are few, a teacher who believes that not every profession or individual can continue LLL states, "*I think it could be difficult for those who dislike changes and love routine*" (M4). Another teacher says, "*I do not think every occupational group can continue LLL. As one gets older, some things may not be possible, and the resulting health problems will be a barrier*" (M7).

When examining the findings regarding the continuation of LLL for every profession or individual, it can be observed that generally, all teachers stated they can continue, while 3 teachers expressed that they cannot continue.

The adequacy of undergraduate education for the teaching profession

Table 4. Adequacy of undergraduate education for the teaching profession

Impact	Participants	%	f
Inadequate	M1, M2, M3, M4, M5, M6, M7, M8, M10, M11, F1, F2, F4, F5, F6, F7, F8, F11, F12, F13, F14	84	21
Adequate	F3, F9	4	2
Undecided	F10, M9	4	2

When examining Table 4, it is stated that 2 individuals find it "*adequate"*, 21 individuals find it "*inadequate*", and 2 individuals are "*undecided*" regarding the adequacy of undergraduate education for the teaching profession.

One teacher who considers undergraduate education adequate expresses, "*Those who want to improve themselves never lose their passion for education. In my opinion, undergraduate education is sufficient for teaching*" (F3). Another teacher who finds undergraduate education inadequate states, "*I do not consider undergraduate education sufficient for the teaching profession. In countries where education is highly developed, such as Finland, teachers are at least graduates with a master's degree and are people who love their job*" (M3).

Another teacher on this matter mentions, "*Definitely not adequate. Having knowledge at the undergraduate level in one field is like a drop in the ocean. Especially, knowledge in psychology, sociology, and history is necessary. Psychology is the field that will most facilitate the teacher's work*" (M7).

Another teacher comments, "*Undergraduate education is a requirement for teaching but not sufficient. Because the classroom environment, individual differences, and experiences contribute different things to the teaching profession. Education and instruction done by doing and experiencing are included in this*" (F13).

Another teacher says, "*I do not find it sufficient. In my opinion, every teacher should continue to take training that enhances both academically and socially after undergraduate education to improve themselves*" (F1).

A teacher who remains undecided when it comes to discussing undergraduate education remarks, "*I cannot say whether undergraduate education is adequate or inadequate. Because I never think that education is ever sufficient for any individual. Because conditions and situations are different in our country, postgraduate education should not be mandatory. Because most teachers live in places where transportation is difficult or far from the universities they really want to attend*" (F10).

When examining the views of teachers on whether undergraduate education is sufficient for the teaching profession, it is noted that 2 individuals find it adequate, 16 individuals find it inadequate, and 2 individuals are undecided.

The participation status of teachers in LLL processes

Table 5. Participation status in LLL processes

Status	Participants	%	f
Yes	M1, M2, M3, M4, M5, M6, M7, M8, M9, M10, M11, F1, F2, F5, F6, F7, F8, F9, F10, F13, F14	84	21
No	F3, F4, F11, F12	16	4

When Table 5 is examined, it is stated that 21 teachers answered yes, while 4 teachers answered no. The teachers who answered yes mentioned that they continue their learning through master's programs, doctoral studies, or various courses (public education, hobby courses, arts and sports training, etc.)

The impact of a teacher's participation in LLL processes on in-class performance

Table 6. The impact of LLL processes on a teacher's in-class performance

	Participants	%	f
Performance improvement	M1, M3, M9, F1, F3, F4, F9, F10, F12, F13	40	10
Efficient lesson delivery	F5, F6, F7, F8, F11, M6, M11	28	7
Teacher success	M2, M5, M10, F14	16	4
Student interaction	M7, F2	8	2
Multifaceted thinking	M8	4	1
Openness to innovations	M4	4	1

When we look at Table 6, we observe that 10 teachers stated an "*increase in performance"*, 4 teachers believed it influenced "*their success*", 1 teacher contributed to "*openness to innovations"*, 1 teacher directed towards "*multifaceted thinking*", 7 teachers claimed "*more efficient lesson delivery"*, and 2 teachers strengthened "*student interaction"*.

A teacher who believes that LLL contributes to performance improvement expressed, *"I think a teacher who continues lifelong learning will make more informed decisions and inferences about emerging topics and events*." (M1).

Another teacher mentioned, *'I believe their motivation will be high. Due to updating and refreshing their knowledge, I think their in-class performance will be high'* (F4).

A teacher expressing the impact on teacher success stated, *'Regardless of the profession, a person who constantly updates themselves will always be successful in their work'* (M2).

Regarding openness to innovations, a teacher said, *"It makes them open to new technologies and information*." (M4). A teacher claiming an impact on multifaceted thinking mentioned, "*It enables them to look from different perspectives and think in a multifaceted way*." (M8).

A teacher predicting more efficient lessons stated, "*They can handle the lesson more efficiently and ensure active participation."* (F6).

Another one stated, "*They can conduct the lesson more efficiently. They can increase the success level by involving students actively in the lesson.*" (F8).

Lastly, a teacher emphasizing student interaction mentioned, "*This way, teachers increase interaction with students. Communication becomes easier*." (F2).

In general, when examining the impact of a teacher's participation in lifelong learning processes on in-class performance, it can be concluded that it leads to performance improvement, influences teacher success, and shapes teachers who are open to innovations and capable of multifaceted thinking. Additionally, it was noted that lessons become more efficient, and communication with students strengthens.

Factors hindering AE and LLL processes

Table 7. Factors hindering AE and LLL processes

Factors	Participants	%	f
Environment	F6, F8, F9, F10, F11, F13, F14 M2, M5, M6, M10, M11	48	12
Physical and economic conditions	F1, F3, F4, F5, F12, M3, M7, M8	32	8
Health problems	F2, F7	8	2
Motivation	M4, F5	8	2
Natural disasters	M1	4	1

When Table 7 is examined, it is stated that 8 individuals identified "*physical and economic conditions"* as the primary obstacle, 11 individuals cited the "*impact of the environment"*, 8 individuals "*physical and economic conditions*", 2 individuals mentioned "*health problems"*, 2 individuals identified "*motivation*" as a barrier, 1 individual attributed hindrance to "*natural disasters*."

A teacher who identified physical and economic conditions as the primary obstacle stated, "*I think time, transportation, and economic reasons will lead to a scarcity of accessible education options*" (F4).

Another teacher mentioned, "*Intense work life, economic difficulties, and livelihood concerns are obstacles to lifelong learning*" (M7).

In the second place, the environment was identified as an obstacle. On this matter, a teacher stated, 'The environment people live in, family structure, and social circle can hinder lifelong learning' (K8), while another said, *"The conditions of the place where one lives are influential. The events that happen to individuals can also have an impact. Additionally, family problems can be effective"*" (K10).

A teacher who believes that health problems create obstacles mentioned, *"I think health problems that arise with age can be an obstacle"* (K7).

Another teacher who believes that natural disasters create obstacles stated, *"I think natural disasters and pandemics can disrupt adult education and lifelong learning*" (E1).

Regarding hindrances arising from personal choice and willpower, a teacher stated, *"The most important factor hindering learning is the individual themselves. Sometimes, people can ignore the opportunities presented to them. They may hinder their development by not looking positively at opportunities that will benefit them or by postponing them"* (K14).

Looking at the general findings of what teachers said about factors hindering Entrepreneurship Education (EE) and Lifelong Learning Processes (LLP), it is indicated that physical and economic

conditions, the environment, health problems, motivation, natural disasters, and personal choice are among the identified obstacles.

The adequacy of activities in Turkey for AE and LLL

Table 8. Competence status of activities for AE and LLL in Turkey

Code	Participants	%	f
Insufficient	M2, M4, M5, M6, M7, M8, M9, M10, M11, F2, F3, F4, F7, F8, F9, F10, F11, F12, F13, F14	80	20
Sufficient	M1, M2, F1, F5, F6	20	5

When examining the data obtained in Table 8, it is stated that in the first place, 5 teachers find the activities for LLL and AE in Turkey to be "*sufficien*t". In the second place, it is mentioned that 20 teachers find the activities for LLL and AE in Turkey to be "*insufficient*".

A teacher who finds the activities sufficient stated, "*Although I find them sufficient, I believe that continuing these activities by increasing them will have a more positive impact on human life regarding the emerging new situations*" (M1).

Another teacher expressed a similar sentiment: "*I find them sufficient. I think the courses offered in public education centers are beneficial. However, these courses are not promoted enough. Many people do not participate in these courses because they are not aware of them*" (F1).

A teacher who finds the activities insufficient commented, "*No. Public education and private courses are available, but they are presented as a way to gain profit rather than providing education to individuals, as they are based on financial concerns*" (M5).

Another teacher said, "*I do not find it sufficient. The governorship, district governorship, and municipalities should also play a role in this*" (M7). Another expressed, "*Most of the education in our country is focused on obtaining certificates, working on certificates, so I do not find it sufficient. Instead, practical-oriented studies would be more effective*" (M8).

Similarly, another teacher stated, "*We know that there are widespread education programs (public education, distance education). However, I do not think it is sufficient. The existence of opportunities abroad but not providing sufficient financial means is a problem*" (F7). In general evaluation of the adequacy of activities for LLL and AE in Turkey, it is noted that the majority of teachers find them insufficient.

Teachers' knowledge status regarding activities for LLL and AE Worldwide

Table 9. Information on activities for LLL and AE Worldwide

Answer	Participants	%	f
No	M2, M4, M6, M8, M9, M10, M11, F1, F2, F3, F4, F5, F6, F8, F10, F11, F12, F13, F14	76	19
Yes	M1, M3, M5, M7, F7, F9	24	6

When Table 9 is examined, it is indicated that 6 teachers have knowledge about activities for LLL and AE worldwide, while the other 19 teachers do not have knowledge on this subject.

A teacher who claims to have knowledge about activities for LLL and AE worldwide stated, "*I know that governments inform people, especially through non-governmental organizations, about emerging situations and support LLL*" (M1).

Another teacher mentioned, "*I am aware of Japan and Finland, where education is of high quality, and how these two countries make efforts to turn both students in schools and adults outside of schools into more conscious and higher quality individuals through comprehensive activities and systems. I can even say that this situation has become a cultural norm in these countries*" (M5).

A teacher admitting a lack of knowledge expressed, "*If I were to self-criticize, unfortunately, I have no knowledge on this matter*" (M3).

Another teacher stated, "*I don't know, but I think it is more practical compared to Turkey*" (M10). It can be concluded that the majority of teachers lack knowledge about activities for LLL and AE worldwide.

Results and Conclusions

In this study aimed at obtaining teachers' views on LLL and AE concepts, the majority of participants stated that they found LLL and AE necessary. They interpreted this necessity as contributing to personal

development, adapting to the changing and evolving era, ensuring continuity in learning, spending quality time, adapting to society, meeting educational needs, and developing social relationships. In a study conducted in the literature, it is understood that continuing postgraduate education, i.e., LLL, contributes to academic development and also contributes to individuals in the social field (Aydemir & Çam, 2015). Moreover, LLL not only involves the process of acquiring education but also equips individuals with competencies that allow them to participate more efficiently in the economic activities required by society, thus not being merely a process of receiving education (Samancı & Ocakcı, 2017). It can be said that the participants in this study recognized the continuous renewal of individuals in various social areas due to the developments in society and the competencies gained through LLL.

While 11 participants expressed that anyone, regardless of profession or individual, can pursue LLL, some mentioned that not everyone can. This situation is somewhat related to individuals exploring their opportunities in their surroundings. In a study by Knapper and Cropley (2000), it is assumed that the concept of LLL is supportive of individuals noticing their current competencies and experience, realizing educational opportunities in their environment, and continuously renewing themselves. Various types of vocational-technical education related to LLL and AE have become significant in some education systems, allowing individuals to acquire different vocational competencies (Andersson & Muhrman, 2020). This has led to increased interest in various types and content of activities offered through LLL and AE educational processes.

While most teachers find undergraduate education insufficient for the teaching profession, some consider it sufficient. Some teachers are indecisive in this regard. Although teachers find their undergraduate education adequate for their profession, it was found that some participants consider this education insufficient, while others remain undecided. This situation can be said to lead teachers to engage in LLL and AE programs. A study conducted by Kara and Demir (2021) with the participation of teachers shows a similarity with this study, as it found that newly appointed teachers find their pre-service undergraduate education inadequate.

The majority of teachers continue their postgraduate education, which is crucial for their professional development. It is essential for teachers to participate in LLL to keep up with current developments, develop a positive attitude toward their profession, and adapt to changes (Ünal & Akay, 2017). In addition, it is necessary to support LLL studies, increase their quantity, and integrate them with technology (Yıldız Durak & Şahin, 2018). Moreover, in today's world, LLL and AE play a crucial role in influencing the prosperity of countries (The World Bank, 2003). Future educators need to be more proactive and conscious in this regard.

Some participants in the teacher group stated that a teacher who continues LLL would contribute to increased performance and success. Others mentioned that it would make teachers more open to innovations within lessons, capable of thinking multidimensionally, efficient in teaching, and enhancing interaction with students. In a scientific study conducted with the participation of teachers by Doğan and Çalışkan (2020), it is emphasized that integrating LLL competencies into the culture of the school is essential, which corresponds to the importance given to LLL and AE concepts by the participants in this study.

The study concluded that the participating teachers emphasized the importance of the continuation of LLL for every profession and individual. This can be interpreted as the teachers being willing to continue LLL processes for their professional development. Considering the results of Yılmaz's (2016) study, which examined teachers' tendencies towards LLL, it is evident that there is a similarity with the findings of this study. Yılmaz (2016) concluded that teachers' tendencies towards participating in LLL processes are positive.

It has been found that teachers' LLL processes positively contribute to classroom performance. The study concludes that teachers' LLL processes primarily impact performance improvement, efficient lesson delivery, and teacher effectiveness within the classroom. This aligns with findings from Çilek et al. (2023), where it was observed that teachers believe LLL activities contribute to their professional development, providing relative support for the findings of this study.

The majority of participants believe that there are factors that hinder LLL and AE. Most teachers mentioned that physical and economic conditions and the environment create obstacles. Some stated that health problems, motivation, disasters, and personal preferences could pose obstacles. In research on factors affecting LLL, it was determined that economics, motivation, age, cultural structure, attitude, skills, experiences, teachers, and literacy have effects (Günüç et al., 2012). While activities related to LLL and AE in Turkey are considered insufficient by most teachers, some find them sufficient. Teachers have been found to perceive the LLL and AE activities offered in Turkey as inadequate. Turkey's ranking at the bottom with a rate of 2.3% in lifelong learning activities among EU countries could be cited as a reason for teachers' perception of LLL and AE activities as insufficient in Turkey (Kaya, 2014). Moreover, the

teachers participating in the research were found to lack knowledge about LLL and AE activities conducted worldwide. This situation may contribute to the perceived inadequacy described earlier.

Recommendations

The importance of encouraging LLL and advanced education among educators and other professional groups cannot be overstated. Teachers, in particular, should be enlightened about the benefits of pursuing further studies, as this has a direct impact on their professional development and the quality of education they provide. To this end, undergraduate teacher education programs should place a stronger emphasis on practical experiences, ensuring that future educators are well-prepared for the realities of teaching.

Furthermore, individuals interested in lifelong learning and AE should receive economic support to facilitate their educational pursuits. The MoNE should consider implementing regulations that provide additional financial incentives for teachers who acquire advanced certifications, such as postgraduate or doctoral degrees, and complete various professional development courses.

To promote LLL and AE effectively, it is essential to raise awareness of available educational activities both within Turkey and globally. Creating accessible and suitable environments for these educational opportunities will ensure that a wider range of people can benefit. Moreover, teachers should be kept up to date on contemporary practices and resources related to LLL and AE, allowing them to enhance their professional skills and remain engaged with global educational advancements.

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How Do Teachers Survive? Turkish Adaptation of Selection, Optimization, and Compensation Strategies Scale

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Abstract

The continuous development of professional competencies and active retention of teachers in the field, stemming from alterations in their professional life cycles, are intrinsically connected to the necessity of lifelong learning for teachers. The model of selection, optimization, and compensation (SOC) strategies can be used to gain insight into the ways in which teachers manage their resources to remain in the profession, how they adapt to their professional lives in the context of lifelong learning, and how to develop effective policies to support the professional development of teachers. Although previous research has emphasized the primary factors that influence teachers' professional development and motivation, there is a scarcity of research on the strategies that teachers use to maintain their employment. In order to fill this gap, this study aims to adapt the Selection, Optimization, and Compensation Scale (SOCS) (Zacher & Frese, 2011), which emphasizes the strategies that teachers use to remain effective in their professional lives, into Turkish. The sample of the study consisted of 299 teachers working in schools in Çekmeköy district of Istanbul province. In the adaptation process of the scale, Turkish translation, back translation, cross-checking, and Turkish face validity stages were followed. Confirmatory Factor Analysis (CFA) was conducted to evaluate the construct validity of the scale. The CFA revealed excellent fit indices for the scale. Consisting of 12 items and three dimensions, the reliability of the scale was evaluated using Cronbach Alpha internal consistency coefficient and composite reliability coefficient (CR). The internal consistency coefficient was 0.81, while the CR value was 0.902. The study's findings demonstrate that the Turkish version of the SOCS is a valid and reliable tool for assessing teachers' use of SOC strategies.

Key words: Lifelong learning, conservation of resources theory, scale adaptation, selection, optimization and compensation.

Introduction

Researchers frequently investigate employees' motivation to remain in their professions (Demerouti et al., 2014; Räsänen et al., 2020) and their active engagement in their professional lives (Moghimi et al., 2016; Müller et al., 2012). It is also recognized that employees maintain their professional functionality by monitoring their gains and losses in order to update their objectives (Meng et al., 2023; Müller et al., 2012; Riedel et al., 2015). According to the Survey of Burnout Rates in the US Labour Force by Occupation (GALLUP) (2022), 44% of teachers experience burnout at work, which is the highest among 14 occupations (Marken & Agrawal, 2022). The fact that teachers are apprehensive about their capacity to remain actively engaged in their profession as their seniority increases leads to issues regarding retention policies and support mechanisms (Geiger & Pivovarova, 2018; Lynch, 2016; Perryman & Calmert, 2019). The Selection, Optimization, and Compensation (SOC) strategies model, which investigates the management of employees' professional and personal lives, highlights the critical role of lifelong learning in individuals' development. This model encompasses a variety of functional areas, including academic achievement, social relations, and professional life, and it is applicable to both micro and macro levels (Baltes, 1997; Baltes & Baltes, 1990; Freund, 2008; Freund & Baltes, 2002; Maass, 2017). Due to its comprehensiveness, Kurt (2016) also refers to it as a metatheory or metamodel. SOC strategies have been

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developed as an alternative to the limited resources available to maintain the ability to work, as outlined in the Conservation of Resources Theory (COR). By diversifying and renewing the resources of individuals, lifelong learning contributes to the conservation of the employee's resources, which is the primary objective of the COR theory. SOC strategies assist individuals in the more effective management of their resources by guiding them through this process. In addition to the disciplines of psychology (Diestel, 2022; Teshale & Lachman, 2016; Wurm et al., 2013), sociology (Sabuncu, 2023), and gerontology (Han & Ko, 2021; Hutchinson & Warner, 2014), research on working life also garners attention (Bal et al, 2013; Becker et al., 2017; Mauno et al., 2020; Müller and Weigl, 2012; Yeung and Fung, 2009; Zacher et al., 2015; Zacher and Frese, 2011).Research on the application of SOC strategies in the workplace has demonstrated that it is particularly important for employees to effectively manage the reduction of individual resources (Riediger et al., 2006). Additionally, it is linked to job commitment, job satisfaction, job performance, and well-being (Moghimi et al., 2016; Müller et al., 2015), organizational citizenship behavior (Müller et al., 2015), and turnover intention (Demerouti et al., 2014). Age, job autonomy, job performance, job satisfaction, and job commitment were all discovered to be positively correlated with the implementation of the SOC strategy in the workplace by Moghimi et al. (2017). Furthermore, Yang (2013) advocated for the implementation of the SOC model to safeguard data centers in workplaces. In fact, it is asserted that the implementation of SOC strategies is positively correlated with job performance and job ability across various work groups (Mauno et al., 2020; Riedel et al., 2015; Viotti et al., 2019; Weber et al., 2018; Yeung & Fung, 2009). It is important to note that research findings indicate that teachers in numerous countries are inclined to terminate their careers (Robertson et al., 2012; Räsänen et al., 2020; Sutcher et al., 2016). This is particularly evident in the context of educational organizations. Low job satisfaction, challenging working conditions, increasing workload, and low autonomy are the primary reasons for teachers' departure from the profession (Bakker et al., 2014; Räsänen et al., 2020). However, a valid and reliable instrument in Turkish that asks how teachers who actively maintain their professional performance and enthusiasm use SOC strategies might help us understand what keeps teachers in their jobs and what factors help them keep doing well in their job.

The Selection, Optimization, and Compensation Scale (SOCS), created by Abraham and Hansson in 1995, was the first scale to evaluate the efficacy of SOC strategies in the workplace. Bal et al. (2013) employed the SOCQ exclusively in a company sample. Baltes et al. (1999) developed the SOCQ scale in German and English, and Freund and Baltes (2002) adapted it into a condensed version. Research on SOC strategies primarily utilizes this scale. It has been implemented in a variety of sample populations, including elderly individuals diagnosed with depression (Huber et al., 2009) and anxiety disorder (Löwe et al., 2012), visually impaired (Kramer et al., 2003), and hearing impaired (Smith et al., 2007), as well as young adults aged 20-30 (Scholz et al., 2005). Zacher and Frese (2011) modified the 12-item short version of the SOCQ (Freund & Baltes, 2002) to make it more relevant to the workplace by prefixing the items with "at work." Zacher and Frese (2011) implemented this version in a variety of sample groups, including white and blue-collar employees, flight attendants (Weigl et al., 2014), and insurance employees (Yeung & Fung, 2009). Zacher et al. (2015) adapted the same scale once more, but this time, they added the phrase "Today" to the beginning of each of the 12 items. This version assessed the nine-day work engagement of employees in a company. Meng et al. (2021) developed the Questionnaire for Measuring Employees' Perception of Selection, Optimization, and Compensation at the Leadership, Group, and Individual Levels. In the development study, healthcare professionals make up the scale's sample. Kurt and Uçanok (2021) translated the 48-item long form of the SOCQ (Freund & Baltes, 2002) into Turkish to assess the processes outlined in the SOC model in the field of psychology broadly. Participants between the ages of 18 and 30, evenly distributed across a variety of demographic variables, including gender, education level, and age, comprised the study's sample.

Significance of Research

Researchers have utilized SOCS in a variety of sample groups to investigate how employees utilize and develop their resources in their professional lives and continue to engage in their professions (Brown et al., 2009). However, research on teachers is relatively limited. A valid and reliable Turkish measurement tool for assessing teachers' use of SOC strategies in their professional lives may enable educators to identify the strategies they employ. Moreover, it can be instrumental in determining resource allocation and supporting professional development at the individual and organizational levels by facilitating teachers' lifelong learning.

Purpose of the study

The objective of this study was to translate and adapt the short version of the Selection Optimisation and Compensation Strategies Scale (SOCS), originally developed for working life by Zacher and Frese (2011), into Turkish, resulting in the Turkish version entitled the Selection Optimisation and Compensation Strategies Scale-SOCSS.

Theoretical Framework

Lifelong Learning and Conservation of Resources (COR) Theory

Individuals continue to face distinctive obstacles in maintaining their employability as a result of rapid technological advancements, globalization, socio-economic changes, and dynamic work environments (Jabeen et al., 2021). In parallel with these obstacles of employees, organisations also take coordinated actions aimed at retaining their valuable employees (Kaźmierczyk et al., 2020). Lifelong learning is necessary for the employee to recognise himself/herself professionally and to develop his/her competencies and to continue his/her profession as a participant in difficulties or change processes. In addition, within the framework of lifelong learning, organisations supporting their employees in both early career and late career stages can enable individual and organisational goals to remain in balance. Therefore, being aware of employees' developmental needs and preferences is necessary to support them.

SOC strategies have emerged from the COR theory (Hobfoll, 1989, 2001). The theory suggests that individuals strive to protect their current resources and acquire new ones (Alarcon, 2011; Halbesleben et al., 2014). Halbesleben et al. (2014) define resources as the elements that enable employees to effectively fulfill job requirements. We can classify the resources into four categories: social supports (from managers and colleagues), material resources (like training materials), lifelong learning opportunities (like training programs, seminars, and mentoring), and internal resources (like knowledge and skills). When there is an equilibrium between the demands placed on employees and the resources available to them, they experience a sense of competence in handling their responsibilities, which in turn boosts their motivation and commitment to remain in their jobs. Conversely, when there are high expectations and insufficient resources, motivation can decrease, and the likelihood of employees leaving the company can increase. The COR theory is a theoretical framework that clarifies the connection between various factors and is employed to predict levels of employee engagement and job satisfaction (Alarcon, 2011; Halbesleben et al., 2014).

Selection, Optimization and Compensation (SOC) Model

The SOC model is a conceptual framework employed to comprehend the continuous and comprehensive growth of individuals throughout their lives (Baltes & Carstensen, 1996; Baltes & Li, 1999; Freund & Baltes, 1998; Lang & Baltes, 1997; Marsiske et al., 1995). Freund and Baltes (1998) argue that development entails individuals actively and purposefully adapting to and influencing both their internal and external surroundings. The SOC strategies model proposes three primary processes of developmental regulation: selection, optimization, and compensation, based on the given assumptions (Moghimi et al., 2019).

Selection

Selection is the process by which employees identify and select a subset of objectives from among possible alternatives. This process focuses limited resources on potential targets (Heckhausen, 1999). The selection process takes place in two ways: elective (vountary) selection and loss-based. Elective (voluntary) selection refers to dedication to and development of goals, creating a hierarchy of goals by focusing on desirable states (e.g., an employee prefers work-related development by extending working hours instead of spending time on hobbies until he/she reaches a certain professional career). Loss-based choice occurs in response to losses that threaten goal attainment or maintenance (Heckhausen, 1999). It involves restructuring one's goal hierarchy in order to manage losses by adjusting goal standards or focusing on different goals (e.g., a teacher who realizes that he/she is not sufficiently equipped to achieve the professional career the employee is aiming for and instead chooses to prepare a scientific project for his/her school with the skills he/she has).

Optimization

Optimization refers to the systematic process of obtaining, implementing, and improving the methods necessary to accomplish specific objectives. For example, a teacher may optimize their efforts by dedicating time outside of class to write a scientific project for their school and engage with students (Baltes, 1997).

Compensation

Compensation refers to the utilization of alternative methods to sustain a desired level of performance when the original means to achieve a specific goal are no longer accessible. For instance, a teacher who intends to write a scientific project for their school may seek assistance from fellow colleagues or attend relevant training sessions to make further advancements in the project (Abraham & Hansson, 1995; Bajor & Baltes, 2003; Freund & Baltes, 2002).

Measurement Instruments Designed for SOC Strategies

Abraham and Hansson (1995) developed the first scale relating to SOC strategies. Consisting of 24 items, the SOC Scale includes three sub-dimensions: selection, optimization, and compensation. There are nine items in the selection sub-dimension, seven items in the optimization sub-dimension, and eight items in the compensation dimension. A six-point Likert-type scale (‘1’ not at all—'6'' very much) is used for responses. The scale's Cronbach alpha value is 0.83 and exceeds 0.80 for each sub-dimension. Bal et al. (2013) conducted the scale's only study on a sample of Dutch companies.

The studies on SOC strategies mostly rely on the short version of the SOC questionnaire developed by Baltes et al. (1999) in German and English and adapted by Freund and Baltes (2002). Both versions of the original SOC questionnaire (Baltes et al., 1999) consist of four subscales, namely ‘’elective selection‘’, ‘’loss-based selection‘’, ‘’optimization‘’ and ‘’compensation‘’. The long version of the SOCQ consists of 12 items measuring each sub-dimension, totaling 48 items. The short version consists of 12 items in total, three for each sub-dimension. In both versions, each of the items in the questionnaire is evaluated with two options, and the participants are asked to choose the most appropriate statement. An example item is ‘I always focus on the most important goal’ (SOC strategy: voluntary choice) or ‘I always work on several goals at the same time’ (non-SOC behavior). Cronbach's alpha ranged between 0.67 and 0.78 for the subscales. Freund and Baltes (2002) conducted the validity and reliability analyses of the scale in a different study. Studies in the literature mostly prefer the 12-item short version of the scale due to its practicality. Many different sample groups have used it, including adults aged 70-80 years (Baltes & Baltes, 1990), young adults aged 20-30 years (Scholz et al., 2005), visually impaired (Kramer et al., 2003), hearing impaired (Smith et al., 2007), elderly people, elderly people with depression (Huber et al., 2009), and elderly people with anxiety disorder (Löwe et al., 2012). Zacher and Frese (2011) adapted the short version of the SOCQ (Freund & Baltes, 2002) in two ways. Firstly, by adding the word ‘at work’ in front of the items, they enabled the participants to answer with a special instruction. Secondly, 12 response options reflecting SOC behaviours were used and the other 12 alternative response options expressing non-SOC behaviours were removed from the scale. The same scale was adapted once again by Zacher et al. (2015) and this time the word ‘today’ was added in front of each of the 12 items. A five-point Likert-type response scale (‘1’ not at all valid - ‘5’ completely valid) was preferred. The Cronbach's alpha value of this scale adapted in the context of working life is 0.77. Again, Cronbach's alpha value for the form adapted by Zacher et al. (2015) to measure nine-day work engagement is 0.94. However, the results of this scale regarding the use of SOC strategies in working life are reported in four different ways in the literature. Firstly, for the SOC questionnaire as an ordered series of strategies, some researchers express only an overall SOC score (Weigl et al., 2014; Zacher & Frese, 2011). Researchers who express separate scores for each of the four sub-dimensions in addition to the overall score present the second method (Demerouti et al., 2014; Yeung & Fung, 2009). Thirdly, a total of three scores are reported, a combined score for elective selection and loss-based selection, and two separate scores for optimization and compensation (Wiese et al., 2002; Zacher et al., 2015). Finally, Abele and Wiese (2008) report scores for only one or two of the four sub-dimensions of SOC strategies. This version, adapted to working life, has been used in different sample groups such as white-collar and blue-collar company employees (Zacher & Frese, 2011), flight attendants (Weigl et al., 2014), and insurance employees (Yeung & Fung, 2009).

Meng et al. (2021) developed the ‘Scale for Measuring Employees’ Perception of SOC at Leadership, Group, and Individual Levels’ to measure the use of SOC strategies at individual, group, and leadership levels in working life. The scale consists of three sub-dimensions and 29 items. Cronbach's alpha value

varies between 0.69 and 0.90 for the sub-dimensions. The items were answered with a five-point Likert-type scale ('1' not valid at all; '5' completely valid). The sample of this scale development study consists of healthcare professionals. In order to measure the processes proposed in the SOC model in the field of psychology in Turkey, the 48-item long form of the SOCQ (Freund & Baltes, 2002) was adapted into Turkish by Kurt and Uçanok (2021). This measurement tool, which they named 'Selection, Optimization, Compensation Questionnaire', was used for the first time in psychology in a study on the well-being of people in emerging adulthood (18-30 years old). The study reported that the Croncbach's alpha value varied between 0.79 and 0.81 for the three sub-dimensions. The sample of this scale adaptation study consisted of participants between the ages of 18 and 30 years, balanced in terms of various demographic variables such as age group, education level, and gender. This Turkish version is used to measure a general model of SOC in the field of psychology. Therefore, the national literature lacks a specific scale adaptation to evaluate the applications of the SOC model in working life. Considering the importance of the SOC model in working life (Abraham & Hansson, 1995; Bajor & Baltes, 2003; Baltes & Heydens-Gahir, 2003; Wiese et al., 2000, 2002), a scale that adapts this model to the teaching profession and measures the functioning of the strategies used by teachers may enable teachers to allocate the resources they need more effectively.

Method

In the study in which the adaptation of SOCQ (Zacher & Frese, 2011) into Turkish was aimed, the survey model was used. The survey model is a research model preferred to collect data on attitudes, behaviours and opinions of the population based on a sample determined from the population (Fraenkel et al., 2015; McMillan & Schumacher, 2014). Therefore, the research is a scale adaptation study. Since scale adaptation studies mean the adaptation of a tested model to another language, confirmatory factor analysis (CFA) is recommended if there is a predetermined relationship between the scale items when performing factor analysis (Kline, 2019). While exploratory factor analysis (EFA) is suitable for scale development studies to define the nature of the scale, CFA is preferred to determine the validity of measurement models or a series of measurements (DeCoster, 1998; Hurley et al., 1997). The nature of the scale was discovered by the researcher in the original study, therefore, in this study, CFA method was applied after the data were examined in terms of normality assumptions in order to test the adaptation process of the scale in terms of internal consistency.

Study Group

The study was carried out with a sample size of 308 teachers employed in schools located in the Çekmeköy district of Istanbul province during the academic year 2023-2024. The data collection process utilized the simple random sampling method. The simple random sampling method ensures that every unit in the population has an equal probability of being selected for the sample, thus enabling sophisticated statistical analyses (West, 2016). The rationale behind the choice of teachers employed in 54 public and 126 private schools in the Çekmeköy district is the higher number of schools in Çekmeköy compared to the average in Istanbul, as indicated by the population ratio in the briefing report published by the Çekmeköy District Directorate of National Education (MEM) in 2021. When conducting scale adaptation studies, it is advised to have a sample size for factor analysis that is at least five times the number of parameters that need to be estimated (Tabachnick & Fidell, 2001) or a minimum of 200 observations (Kline, 2019). A total of 308 volunteer participants were recruited for the purpose of obtaining reliable results in CFA. The study excluded the scale forms of nine participants who were incomplete or incorrectly filled out. The study then continued with the scale forms of 299 participants. According to the data of Istanbul Directorate of National Education (2024), the characteristics of the population and sample group are presented in Table 1.

Table 1. Characteristics of the population and sample group

School type	Number of Schools	Number of teachers	Ratio of teachers in the population (%)	Sample	Ratio of teachers in the sample (%)
Preschool	44	136	6,77	27	9
Primary School	37	425	21,18	114	38
Secondary School	49	659	32,85	74	24,6
Anatolian High School	25	457	22,78	13	4,6

Science School	4	81	4,03	7	2,3
İmam Hatip High School	7	73	3,63	27	9
Vocational and Technical High School	10	175	8,72	24	8
Special Education Classes	-	-	-	13	4,3
Total	176	2006	100	299	100

Of the participants, 34.7% (n = 103) were female and 65.3% (n = 196) were male teachers. 2% (n = 6) were associate degree graduates, 73.6% (n = 219) were bachelor's degree graduates, and 25.7% (n = 74) were master's degree graduates. We collected data from a total of 23 schools, with 92.4% (n = 276) being public schools and 7.6% (n = 23) being private schools. Of the participants in these schools, 9% (n = 27) were kindergarten teachers, 38% (n = 114) were primary school teachers, 24.6% (n = 74) were middle school teachers, 4.6% (n = 13) were Anatolian high school teachers, 2.3% (n = 7) were science high school teachers, 8% (n = 24) were vocational high school teachers, 9% (n = 27) were imam hatip high school teachers, and 4.3% (n = 13) were special education class/school teachers. Since special education classes were opened as an additional class in the staff of other schools, the statistical data of the teachers working in these classes could not be expressed in the table. Among the teachers participating in the study, 16.6% (n = 50) had one to five years of service, 15.8% (n = 48) had six to 10 years of service, 21.1% (n = 63) had 11 to 15 years of service, 16.2% (n = 49) had 16 to 20 years of service, and 30.2% (n = 90) had 20 years or more of service. Of the schools in which they were working, 19.2% (n = 57) were located in a lower, 74.3% (n = 222) in a middle, and 6.4% (n = 20) in a lower socio-economic level region.

Data Collection Tool

In this study, the SOCQ developed by Zacher and Frese (2011) was adapted into Turkish. The Turkish version was named as " Selection, Optimization and Compensation Strategies Scale- SOCSS". The original scale, which measures participants' use of SOC strategies in working life, consists of a total of 12 items measuring four sub-dimensions (voluntary choice, loss-based choice, optimization, compensation), each consisting of 3 items. The scale was reorganised by Zacher et al. (2015) and used in three dimensions: selection, optimization and compensation.

In the self-report measurement tool, participants were asked to report what they think, feel and do in their working life in general on a five-point Likert scale (1 = Almost never, 5 = Almost always). Some sample items in the scale are "I keep working until I succeed in what I have planned at work." and "If something is important to me at work, I devote myself completely to it.". The scale form, which included a brief information about the study, was distributed to the volunteer participants by the researchers and the data were collected by the researchers themselves.

Scale Adaptation Process

During the adaptation of the scale into Turkish, evidence of different types of validity was collected by using the translate-retranslate method (Beaton et al., 2000). In the literature, it is frequently emphasised that translators being experts in their fields and having sufficient experience directly affect the validity, reliability and equivalence of translations (Bracken & Barona, 1991; Hambleton & Kanjee, 1995). As shown in Table 2, four different expert groups consisting of experts who are highly proficient in the source and target languages and experienced in translation were formed to consult at each stage of the adaptation process. Except for the experts in the fourth group, all of the experts had a postgraduate degree in educational sciences, were fluent in English and Turkish, and had at least 10 years of professional experience. The characteristics of the experts who contributed to the translation process are shown in Table 2.

Table 2. Characteristics of expert groups

Expert Groups	Aim	Experts	Expertise	Seniority
1. Expert Group	Turkish Translation	E1	English Language Teacher- PhD	13 years
		E2	Interpreter Translator- PhD.	14 years
		E3	English Language Teacher- PhD.	17 years
		E4	English Language Teacher- PhD	11years
		E5	Interpreter Translator- PhD	17 years
		E6	English Language Teacher - MA	11 years

2. Expert Group	Reversing	E1	English Teacher- MA	12years
		E2	Interpreter Translator- PhD	16 years
		E3	English Language Teacher- PhD	11 years
		E4	English Language Teacher - MA	13 years
		E5	Interpreter Translator- PhD	17 years
		E6	English Language Teacher- Ph D	16 years
3. Expert Group	Cross Check	E1	Academician (Teacher Education)- Assoc. Prof. Dr.	21 years
		E2	English Language Teacher- PhD	18 years
4. Expert Group	Face Validity	E1	Preschool Teacher	22 years
		E2	Preschool Teacher	4 years
		E3	Preschool Teacher	7 years
		E4	Primary School Teacher	24 years
		E5	Primary School Teacher	19 years
		E6	Primary School Teacher	14 years
		E7	Primary School Teacher	25 years
		E8	Turkish Language Teacher	21 years
		E9	Social Sciences Teacher	3 years
		E10	Science Teacher	13 years
		E11	Maths Teacher	17 years
		E12	English Teacher	18 years

In the adaptation process, permission was first obtained from the authors of the original scale. In addition, necessary correspondences were made and permissions were obtained from the Ethics Committee of the University and the Directorate of National Education for the implementation of the scale. In the first stage, 12 items were translated into Turkish by six foreign language experts. In order to ensure language validity, it is recommended to use a short and simple language and to get help from translators and experts in the field in translation processes (Hall et al., 2003). According to Seçer (2018), instead of translating the items into Turkish one-to-one, cultural adaptation of the items by Turkish and foreign language experts with the necessary arrangements will contribute to validity and reliability. In this direction, the translated scale was translated back into English by six foreign language experts who are also in the teaching profession. In line with the suggestions received from the experts, the original scale, the translation and the back translation were carefully compared, and the differences and inconsistencies were identified and corrected. Thus, the semantic equivalence between the original language and the translated language was confirmed (Hambleton, 2005).

In order to support the face validity of the scale, a total of 12 teachers (three kindergarten, four primary school and five secondary school teachers) were asked to examine the final version of the translation and to express the points they did not understand on paper. The feedback from the teachers revealed that there were no incomprehensible scale items. Two Turkish language experts were then asked to evaluate the comprehensibility and readability of the scale for the target audience. Thus, the content validity of the scale was theoretically guaranteed by the literature and experts, and face validity was ensured by the opinions of both experts and teachers.

Data Anaysis

Before analysing the data obtained after the translation studies, the suitability of the data to normal distribution was examined. Measures of central tendency and kurtosis and skewness values were taken into consideration to determine the conformity of the data to normal distribution (Tabachnick & Fidell, 2013). The values related to the suitability of the data for normal distribution are presented in Table 3.

Tablo 3. Normality assumption values

Scale dimensions	n	Min.	Max.	Mean	SS	Skewness	Kurtosis
Selection	299	11	30	22,32	3,558	-,308	,279
Optimization	299	6	15	12,84	1,737	-,740	1,113

Compensation	299	6	15	11,85	1,806	-,465	,740
Total Scale	299	24	60	47,01	5,894	-,330	1,099

*p>0,05

Upon examining the kurtosis-skewness values for each scale item in Table 3, it is observed that they fall within the range of -2 to +2. According to researchers, if the kurtosis and skewness coefficients fall within the range of ±2, it indicates that the data follows a normal distribution (Hair et al., 2010). Therefore, researchers discovered that the dataset satisfied the assumptions of univariate normality. We conducted the CFA using the AMOS 21.0 software package after completing the pre-CFA assumption analyses using the SPSS 27.0 software package.

Findings

According to the results of the CFA conducted to reveal the construct validity of the Selection, Improvement and Compensation Strategies Scale (SOCSS), the factor loadings for all items were calculated between 0.473 (e6) and 0.840 (e10). It is recommended that items with factor loadings below 0.40 should be excluded from the analysis on the grounds that their contribution to the research will be low (Beavers et al., 2013; Hinkin, 1998). When the correlations between variables were analysed, no item deletion was performed since the factor loadings of the scale items were above 0.40 and all correlation relationships were significant.

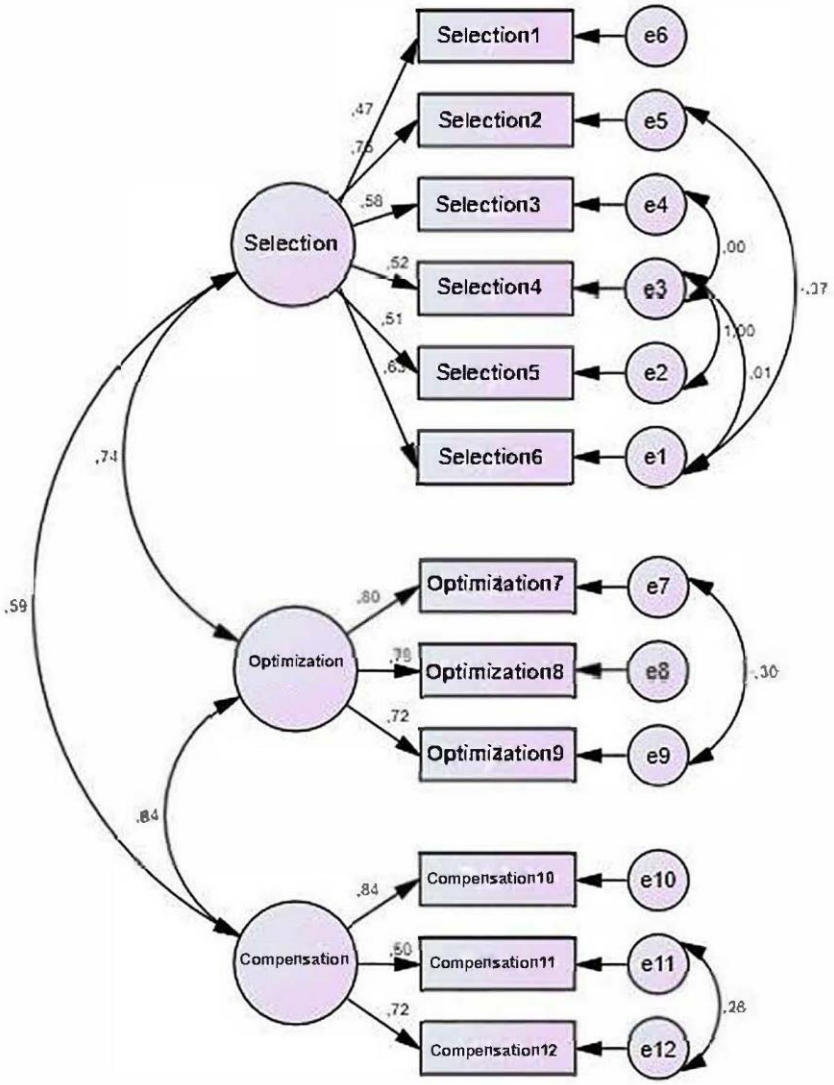
When the AMOS modification indices were examined, the Chi-Square (χ2) value of the modification between e1 and e3 was 13.142, the χ2 value of the modification between e1 and e5 was 13.142, and the χ2 value of the modification between e2 and e3 was 17.747, It is understood that the modification between e3 and e4 will cause a significant decrease in the χ2 value by 10.054, the modification between e11 and e12 will cause a significant decrease in the χ2 value by 10.871, and the modification between e7 and e9 will cause a significant decrease in the χ2 value by 8.191. Afterwards, it was seen that the accepted values were met in the renewed fit value calculations (Simon et al., 2010; Hooper et al., 2008). The fit indices obtained before and after the modifications are shown in Table 4.

Table 4. Suitability of the measurement model for construct validity assessment

Fit Indices	Pre-Modification Values	Post-Modification Values	Excellent Fit Indices	Acceptable Fit Indices	Explanation
ChiSq/df	3,156	2,105	0≤χ2 /df≤3	3≤χ2 /df≤5	Perfect Fit
RMSEA	0,085	0,061	0,00≤RMSEA≤ 0,05	RMSEA ≤ .08	Acceptable Fit
GFI	0,918	0,951	0,90 ≤ GFI	0,85 ≤ GFI	Perfect Fit
CFI	0,900	0,982	0,95≤CFI≤1,00	0,85≤CFI	Perfect Fit
NFI	0,862	0,967	0,95≤NFI≤1,00	0,80≤NFI≤0,95	Perfect Fit

The CFA results in Table 4 were compared with the reference ranges of the fit indices provided by Simon et al. (2010) and Hooper et al. (2008). This comparison supports the validity of the item-structure relationship in the SOCSS, which consists of three dimensions and 12 items. No changes were made to the items in the scale form. Furthermore, all evidence indicates that the construct was successfully validated for every individual item and dimension of the scale. Figure 1 displays the distribution of the item loadings on the factors resulting from the confirmatory factor analysis (CFA) conducted after making improvements to the model.

Figure 1. SOCSS confirmatory factor analysis (CFA) diagram



Reliability Findings

The reliability of the Selection, Optimization and Compensation Scale was tested by means of Cronbach's alpha coefficient and Composite reliability values. The calculated Cronbach's alpha coefficient of the three-dimensional scale was found to be 0.86. The Cronbach's alpha coefficients for the sub-dimensions are 0.79 for the " selection" sub-dimension, 0.78 for the " optimization" sub-dimension and 0.76 for the "compensation" sub-dimension. A Cronbach's alpha reliability coefficient between 0.60 and 0.80 indicates that the scale is "moderately reliable", and a coefficient between 0.80 and 1.00 indicates that the scale is "highly reliable" (Kayış, 2009; Kılıç, 2016). The reliability coefficient calculated for the whole scale was between 0.68 and 0.78, indicating that the scale is highly reliable. Internal consistency coefficients for the whole scale and its sub-dimensions are presented in Table 5.

Table 5. SOCSS Cronbach Alpha and Composite Reliability (CR) Values

SOCSS Dimensions	Cronbac's Alpha	Composite Reliability
Selection	,790	0,751

Optimization	,783	0,814
Compensation	,766	0,745
Total Scale	,860	0,902

Reliability analyses in multi-factor constructs may be limited by the assumption of unifactoriality in Cronbach's alpha. Hence, it is advisable to compute the CR as a substitute. The CR value quantifies the degree of consistency with which all items on the scale measure a single overarching factor. Typically, the CR value is anticipated to exceed 0.70, according to Fornell and Larcker's research in 1981. This value indicates the scale's reliability as a measurement tool. The calculated CR value for the SOC Form is 0.902, as shown in Table 5. This value indicates the reliability of the scale, affirming its usefulness as a reliable instrument for assessing employees' adherence to the processes proposed by the SOC model. Table 6. displays the Pearson correlation coefficients among the sub-dimensions of the scale. When conducting a scale adaptation study, it is crucial to examine the correlation values among the sub-dimensions. This analysis helps assess the scale's structural validity, the distinct attributes measured by each sub-dimension, the scale's reliability, and the interpretation of the sub-dimensions (Lamm, 2020). The analyses indicate a strong and statistically significant correlation between the sub-dimensions of the SOCSS.

Tablo 6. Pearson Correlation (r) Coefficients between SOCSS Subscales

SOCSS Dimensions	Optimization	Compensation	Selection
Optimization	1	,631**	,533**
Compensation	,631**	1	,408**
Selection	,533**	,408	1

**. p< 0.01

Results, Conclusions and Recommendations

Understanding how teachers effectively manage their gains and losses is crucial for maintaining professional functionality throughout the lifelong learning process. The objective of this study is to translate and modify the "Selection, Optimization, and Compensation Questionnaire-SOCQ," originally adapted for the context of work by Zacher and Frese (2011), into the Turkish language. In order to achieve this objective, the researchers analyzed the model fit, CFA, and item fit indices of the Turkish version of the scale. We assessed the validity of the scale through language validity, face validity, content validity, and construct validity. In addition, we examined the scale's reliability using the Cronbach alpha coefficient and composite reliability coefficient. The research commenced by translating the scale into Turkish, followed by a backtranslation to ensure linguistic validity. Additionally, expert opinions were sought. To ensure content validity, a preliminary application was conducted with teachers from various educational levels, and the scale was subsequently finalized. Data was collected from 299 teachers in various school types using the Turkish version of the scale. The validity study of the scale conducted a confirmatory factor analysis, which confirmed the original four-dimensional and 12-item structure without any modifications to the scale form (Zacher et al., 2015).

As a result of the examination of the modification values, it was seen that ChiSq/df (2.105), GFI (0.951), CFI (0.982) and NFI (0.967) values showed excellent fit and RMSEA (0.061) value was within an acceptable reference range (Simon et al., 2010; Hooper et al., 2008). The correlation coefficients of the scale indicated a statistically significant positive relationship between the sub-dimensions. Overall, the evaluation of the validity and reliability analyses in the process of adapting the SOCSS scale shows that the scale possesses adequate psychometric qualities and serves as a dependable tool for collecting data on teachers' utilization of SOC strategies in Turkey. Therefore, SOCSS can be utilized in research on the SOC strategies employed by educators in their professional lives and the factors that may be linked to lifelong learning endeavors. Zacher and Frese (2011) have established that actively employing SOC strategies enables employees to establish goals and effectively adjust to the growing demands of their job in the future. A valid and reliable measurement instrument that specifically examines strategies related to social and emotional competence (SOC) can provide valuable insights into how teachers can effectively navigate the challenges and opportunities they encounter in their professional lives (Robson et al., 2006).

In addition, SOCSS can contribute to the growing research literature on the SOC model by enabling teachers to understand how teachers use the SOC model in their lifelong learning processes by investigating the interaction between increasing workload and changes (introduction of technology into classrooms, cultural differences in classrooms, changing curriculum, etc.) and the use of SOC strategies (Riediger et al., 2006). Although there are findings on the positive effects of using SOC strategies in working life (Abraham & Hansson, 1995; Bajor & Baltes, 2003; Baltes & Heydens-Gahir, 2003; Wiese et al., 2000, 2002), it is not known which strategies teachers apply. In addition, knowing the role of SOC strategies in teachers' retention and active professional lives may contribute to the professional policies to be developed. It is also necessary to look at the issue from the perspective of organisations and leaders. Conservation of resources follows a parallel process with lifelong learning. Knowing the efforts and preferences of employees to stay in the profession can pave the way for providing them with opportunities to support lifelong learning. As a matter of fact investing in the improvement of employees' working skills through formal and non-formal education is crucial for both employers and employees. This investment not only enhances the flexibility, creativity, and productivity of employees, but also enables businesses to confront the challenges of competition in their respective fields (Beqiri & Mazreku, 2020). The individual performance of the employees is also reflected in the organisational performance, therefore, the productivity and effectiveness of the organisation increases in direct proportion to the level of success of the employees when they perform the tasks appropriate to their qualifications and skill levels and when they work in line with their capacities by seeing alternatives (Argon & Taşkın, 2023).

There are some limitations of this study that should be discussed. Firstly, the data only come from a self-reported five-point Likert-type response scale ("1" not valid at all—"5" " completely valid). Using situational interviews to gather qualitative data to support these quantitative data may improve our understanding of the scale's validity. Zacher and Frese (2011) found a high agreement between the self-report response scale and external observers' ratings in their original scale adaptation study, but they recommend replicating the current findings for more objective measurements (Grebner et al., 2004). Another limitation of the study is that the sample selected from Çekmeköy district of Istanbul province consists of participants with middle and upper levels of education and income. This situation may affect teachers' perceptions of SEIT strategies. Therefore, applying the scale in different cultural contexts may provide more meaningful findings in terms of reliability. Finally, teachers' professional skill levels, experiences, and professional development needs vary. It may be important to take these differences into consideration when administering the adapted SOCSS for teachers in order to accurately reflect the implementation of SOC strategies (Meng et al., 2021).

Despite these limitations, a teacher-adapted SOCSS can help us comprehend how teachers' knowledge, skills (Frese, 1982), age (Young et al., 2007), school type, seniority (Riediger et al., 2006), and environmental resources (Farr et al., 1998) interact with their SOC strategies in response to rapid changes in the education field, growing workload, curriculum changes, and potential impacts on teachers in the future.

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Cheating in Higher Education in the Age of Artificial Intelligence[1]

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Abstract

In this study, cheating behaviors of higher education students and the changes in these behaviors due to developments in the field of artificial intelligence were examined based on the literature. The investigations show that the cheating behavior of the students is at a level that disrupts the accuracy of the decisions made about the students and academic honesty, which is one of the cornerstones of higher education. Cheating in exam, plagiarism and contract cheating are the most common of these behaviors. The way cheating behavior is displayed has also changed from past to present, depending on educational programs, measurement approaches, and developments in technology and artificial intelligence. Tremendous developments in the field of artificial intelligence in the last three years have caused students to make artificial intelligence tools an indispensable part of their cheating processes. This situation requires the development and implementation of new methods to detect and prevent cheating in higher education. Therefore, structuring new studies that address the cheating problem and its solutions in various aspects, including the technology and especially artificial intelligence dimension, is important in terms of its contribution to relevant people and institutions. It is thought that this study is important in terms of drawing attention to the issue.

Key words: Artificial intelligence, cheating, higher education, academic integrity.

Introduction

Higher education institutions are the most important institutions that ensure the training of skilled and qualified workforce required for the welfare of societies (Ekinci et al., 2018; Voronkova and Dolgova, 2021). In these institutions, where undergraduate and graduate education is provided, students' success levels are tested and very important decisions are made about them, such as passing a course, passing a class, and being eligible to receive a certificate/diploma. In this process, different measurement techniques are used depending on the structure of academic programs and courses. Exams, assignments, term projects and dissertations are some of these techniques (Haladyna, 1999; Nitko, 1996, Turgut and Baykul, 2021). The accuracy of the decisions made about students is closely related to the validity of the chosen technique and the reliability of the measurement results obtained (Atılgan et al., 2016).

Cheating is one of the important variables that negatively affects the reliability of measurement results. Cheating can be defined in general terms as "a student exhibiting dishonest/deceptive behavior/s in order to gain an undeserved score or advantage in decision-making processes related to him/her, such as passing a course, passing a class, or being entitled to receive a certificate/diploma". Cheating is an important problem that disrupts academic integrity in higher education as well as other levels of education, and this problem continues to exist every period (Baijnath and Singh, 2019). Cheating in exams, plagiarizing homework, term projects, dissertations etc or resorting to contract cheating are the main traditional cheating behaviors shown by students (McCabe and Trevino, 1997; Claire et al., 2017). The rate

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of students exhibiting unethical behavior, which can be considered within the scope of cheating, is quite high, although it varies depending on the level of education, the structure of the courses and the type of measurement practices (Dee and Jakob, 2012; Koç and Memduhoğlu 2021; Topçu and Gürer, 2019).

With the tremendous developments in the field of artificial intelligence (AI) in the last few years, changes have been observed in the cheating behavior of students. With artificial intelligence-supported natural language processing tools such as ChatGPT, exam questions can be answered within seconds, and human-like texts and contents such as photographs, videos, graphics, etc can be produced in short periods of time. Therefore, although students still use classical cheating approaches in exams and in the preparation of studies such as assignment, term projects, and theses, they have been using AI applications more in recent years (Lee, et al., 2024; Xie et al., 2023).

When the relevant literature is examined, although there are many studies that address the cheating problem from different aspects from past to present (Çakmak, 2015; Chirikov, 2020; Etter and Finn, 2006; McCabe and Trevino, 1997; Tight, 2024; Ünal and Uçak, 2017) it seems that there are a limited number of studies examining the development in the field of AI and its relationship with cheating (Lee et al., 2024; Xie, 2023; Sweeney, 2023). Therefore, it is thought that new studies on the subject will make significant contributions to relevant people and institutions in redefining the problem and producing solutions.

In this study, cheating in higher education institutions; it was discussed and examined based on the literature, i) in terms of the cheating behaviors shown by the students, ii) in terms of the changes in the cheating behaviors of the students with the developments in the field of artificial intelligence, and iii) in terms of the steps to be taken on an institutional and individual basis to detect and prevent cheating behaviors.

Cheating behaviors of higher education students

Higher education

The general purpose of higher education is to ensure the development of human capital, advancement of knowledge and meeting social needs through scientific research and advanced education (Pretti-Frontczak and Bricker, 2000; Voronkova and Dolgova, 2021). Achieving this general goal is only possible with qualified workforce/expertise. From this perspective, the aim of higher education is to ensure specialization in all relevant fields of study through institutions such as universities. As a result of the education provided at undergraduate and graduate levels in higher education institutions, students are entitled to receive bachelor's degree, science specialist and Phd titles. In addition, higher education institutions offer advanced education in various fields of expertise through their centers and the certificate programs they offer. The education offered by these institutions encourages students to use and develop more intensively the skills required by the current age (e.g. critical thinking, analytical thinking, scientific research abilities, etc.). Supporting the personal development of students during the specialized education process, reinforcing their ethical values, increasing their global awareness, contributing to their making lifelong learning a basic behavior and ensuring that they prioritize contribution to society are among the important areas of responsibility of higher education (Yükseköğretim Kanunu, 2024).

Cheating in higher education

Cheating is completely contrary to the purpose and nature of higher education, which emphasizes quality, competence and individual development. The high risk that higher education institutions face due to cheating is alarming. Increasing cases of cheating disrupt the high standards of universities and damage their institutional reputation (Baijnath and Singh, 2019).

Cheating is the biggest enemy of academic integrity, which is of great importance for higher education institutions offering advanced education (Sozon, 2024). Cheating is one of the most important variables that negatively affects the validity and reliability of the measurements that form the basis for decisions about students (Atılgan et al., 2016). Therefore, it causes students' success grades, diplomas and even higher education itself to be questioned by all stakeholders (e.g. private/public employers, etc.). Cheating is also an important ethical problem that negatively affects students' psychosocial and moral development (Dodeen, 2012).

Cheating in exams, plagiarism and contract cheating are the most common cheating methods among higher education students. There are many educational, psychological and sociological factors underlying students' cheating actions. Fear of failure, desire to be more successful, parents' expectation of high

grades, anxiety about not completing school, laziness, etc are some of the main reasons for cheating by students (McCabe et al., 2001; Semerci 2004).

Cheating in exams

Numerous studies have shown that cheating in exams is a behavior that is common at every stage of education and continues to be a problem (Koç and Memduhoğlu, 2021). The rate of student cheating in exams has been increasing all over the world, from past to present (Baijnath ve Singh, 2019; Lanier, 2006). In particular, increasing distance education programs due to technological developments/Covid 19 pandemic reasons and the fact that exams related to these programs are held remotely on computers have further increased the rates of cheating in exams (Newton and Essex, 2023; Özalkan, 2021; Valizadeh, 2022).

As in other levels of education, there are many studies examining the cheating problem in higher education from different perspectives, such as the methods used in the cheating process in exams, its reasons and solutions. Some of the common results emerging from these studies are as follows: (Dodeen, 2012).

1. Cheating on exams is a common and serious problem in schools and universities.
2. The percentage of students who admit to cheating on exams during their university years varies between 40% and 80%.
3. Male students cheat more than female students.
4. Students with low academic success cheat more than students with high academic success.
5. Cheating on exams increases in large and crowded classes.
6. Cheating is more common in multiple-choice exams than in structured-answer exams.
7. Rates of being caught cheating are low, and universities and faculty do little to prevent cheating on exams.
8. Anxiety about passing the course, anxiety about graduation, desire to get good grades, etc are the main reasons why students cheat on exams.

Plagiarism

Studies that require conducting and presenting research, such as assignment, term projects, and dissertations, are among the important measurement approaches used in higher education. This measurement approach, which requires the use of advanced mental skills, is compatible with the nature of higher education. In order to complete such studies, students are expected to be proficient in scientific research and analysis methods as well as field knowledge. Completing these works requires high effort and long time. Therefore, instead of fulfilling the requirements of this process, some students may take the easy way out and resort to unethical methods such as plagiarism.

Plagiarism is defined as "taking sections or lines from other people's writings and presenting them as one's own or adopting other people's topics and telling them in a different way; plagiarism" in current Turkish dictionary (sozluk. gov.tr, 2024). It is defined in the Cambridge English Dictionary as "the behavior of using/showing another person's ideas or works as one's own" (Dictionary.cambdridge.org, 2024). According to Harvey (1995), plagiarism is "the act of lying, cheating and stealing by using someone else's information, thoughts or words as one's own sentences without placing quotation marks" (cited in Eminoğlu, 2008). The Counsil of Higher Education defines plagiarism as "presenting the original ideas, methods, data or works of others as one's own work, in whole or in part, without citing them in accordance with scientific rules." (Yükseköğretim Kurulu, 2024).

There are many different behaviors that can be considered within the scope of plagiarism (Rayhan and Amer, 2021). Some of these behaviors can be listed as follows: (Nedir.com, 2024)

- Taking some or any part of the books, articles, etc written by others and presenting it as if he/she wrote it himself/herself.
- Changing the text written by someone else and writing it as one's own.
- Using a piece of text taken from someone else's work without citing the source.
- Taking someone else's work and presenting it as a newly prepared work.
- Presenting an existing product or intellectual work as if it were new and one's own.

Anxiety about failure, anxiety about graduation, parental/peer pressure, lack of knowledge of scientific research methods are some of the reasons why students plagiarize (Rayhan and Amer, 2021; Abbasi et al., 2021). Plagiarism rates among higher education students are quite high. The fact that students can easily

access literature and related documents for every possible subject area via smart devices, the internet and search website is an important factor in the increase in plagiarism behaviors (Ünal and Uçak, 2017).

Apart from the general reasons, other important factors that push higher education students to plagiarize are as follows: (Abbasi et al., 2021; Gullifer and Tyson, 2010; Kent.edu, 2024).

- Students are not confident about the adequacy of their work. They are reluctant to take risks.
- Students cannot receive sufficient consultancy support from instructors during the preparation of the assigned homework.
- Students' lack of time management skills. They cannot plan the time and effort required for research-based studies well and therefore believe that they have no choice but to plagiarize.
- Students' inadequacy in terms of the rules of preparing academic documents/research reports.
- Faculty members and institutions do not monitor whether student works contain plagiarism.
- Institutions do not impose appropriate penalties upon detection of plagiarism, and therefore students consider the consequences of plagiarism unimportant.

Contract cheating

Contract cheating is when students have their work done by someone else for a fee or without payment, take a ready-made work and act as if they did it themselves. The person referred to as "someone else" here may be someone you know, such as a friend or family member, or it may be a ghostwriter working for a company/writing firms that do this work for a fee (Baird and Clare, 2017; Ellis, Zucker and Randall, 2018). The reasons why students use contract cheating are like the reasons for cheating and plagiarism in the exam. The abundance of agencies offering contract cheating services and their easy accessibility greatly increases the rate of contract cheating by students (Lee, 2024; Sweeney, 2023). 16% of students admit to paying others to complete their studies. 67% of instructors say they do not have enough evidence to support their claims and therefore cannot act. There is a $15 Billion contract cheating industry that has been described as predatory by The Better Business Bureau (Turnitin.com, 2024). This industry has become a growing threat to academic integrity in higher education (Ali et al., 2021; Sozon, 2024).

Cheating behavior of higher education students in the age of artificial intelligence

ChatGPT and similar artificial intelligence tools can train themselves with the information they obtain from very large databases. In this way, it is possible to write texts and produce content such as photos, videos, etc that are indistinguishable from those produced by humans. These tools stand out for their ability to perform a wide range of language tasks, including answering questions, summarizing texts, chatting, and performing advanced translation (openai.com, 2024). These tools perform such language tasks in seconds, almost like a magic wand (Klshybekova and Abbott, 2024). This tremendous development in the field of artificial intelligence has brought about an incredible transformation in all areas of life, including industry, health, sports, arts and education. There is no doubt that the well-intentioned use of the development will be for the benefit of humanity.

However, as always, it is inevitable that this innovation will be used by someone for unacceptable purposes. The use of artificial intelligence tools for cheating purposes in the education process is one of these malicious uses. Looking specifically at higher education, research on cheating shows that there have been significant changes in the cheating behavior of students due to developments in smart devices such as computers and phones, the internet and especially artificial intelligence, and that students have made these an important part of the cheating process (Lee, 2024; Xie, 2023).

While taking exams with small notes containing cheating information, looking at your friends' answers during the exam, and changing exam papers are traditional cheating behaviors that are common in exams (Akdağ and Güneş, 2002; Çeliköz, 2016; Dam, 2013), cheating in exams by exchanging questions and answers through technological tools with messaging features has become popular (Etter et al., 2006). Artificial intelligence tools have made it very easy for students to cheat in exams without even having to make this purchase. Artificial intelligence applications such as ChatGPT can answer almost all exam questions correctly. This situation has now made artificial intelligence tools an indispensable element of the cheating process in exams (Lee, 2024). So much so that the use of these tools, especially in online exams, has increased significantly and has dealt a serious blow to academic integrity (Susnjak and McIntosh, 2024).

Studies that require writing research-based text, creating content and presenting it as a report, such as assignment, term projects and dissertations, which have an important place in measuring student success in higher education, can now be completed in a very short time with artificial intelligence tools. Qualified prompts ensure that products have low plagiarism rates and make it difficult to determine whether the

product contains plagiarism. Therefore, cheating-prone students now prefer to have artificial intelligence tools do this kind of work, which requires great effort and time, and present it as if they did it themselves, instead of doing it themselves (Lee, 2024; Sweeney, 2023).

Artificial intelligence tools have made the work of contract cheating services much easier and enabled them to provide the text/report they want to those who request it in a short time. This situation has led to an increase in the number of centers providing relevant services and ultimately to a further deterioration of academic integrity in higher education institutions (Carmichael and Weiss, 2019).

Steps to be taken on an institutional and individual basis to detect and prevent cheating behavior in higher education - General and AI related

Some of the institutional and individual steps (Chirikov et al., 2020; Malgwi and Rakovski, 2009) that can be taken in the process of identifying and preventing cheating in exam (Baijnath and Singh, 2019; Eraslan, 2011; Tan, 2001; Tight, 2024;), plagiarism (Çakmak, 2015; Ersoy and Özden, 2011; Ünal and Uçak, 2017) and contract cheating (Lines, 2016; Sweeney, 2023) behaviors in higher education institutions are as follows:

- To organize trainings for all stakeholders (administrators, academic staff, students, administrative staff) within higher education institutions on academic integrity, academic dishonesty, cheating and ethics.
- To include in detail the scope of behaviors that violate academic integrity such as cheating and the penal sanctions that will be applied to these behaviors in the student disciplinary regulations of higher education institutions.
- Signing a contract with students at the beginning of the education process stating that they will not cheat. These agreements can be made on a program basis or on a course basis by each faculty member.
- To include practical and oral exams, as well as other measurement approaches, in the process of measuring student success.
- Conducting paper-pencil exams face to face and with proctor support.
- To purify the exam environment from elements that enable cheating in the exam (spaced seating arrangement, use of different test forms, prohibition of the use of technological tools-smart devices, etc.).
- In online exams, preventing the use of other tabs of the computers, taking screen recordings, ensuring that the cameras remain on, etc.
- Scanning student papers for plagiarism using plagiarism checking tools like Turnitin or Grammarly.
- Analyzing whether student papers were written by AI with tools like GPTZero and Originality AI, which are specifically designed to detect AI-generated texts.
- To ensure that the content of assignment, term projects, etc. given to students is original. To organize relevant studies in a way that requires students to use high-level mental skills such as creativity, critical thinking, etc.
- To hold interim meetings at every stage of the process of preparing students' assignment, term projects, etc., and to control and guide what has been done.
- To determine the similarity rate of studies prepared by students (assignment, term project, dissertations, etc.) with plagiarism detection tools.
- To examine the citation-source harmony in studies prepared by students (assignment, term project, dissertations, etc.).
- Having students prepare similar works to AI tools, analyzing the resulting product in terms of its typical features, and comparing the students' work with these typical features.
- To analyze the students' old works, which are known to have been prepared by them (sentence order, compliance with spelling rules, etc.) and compare them with the new works they present.

Results Discussion and Suggestions

In this study, cheating behaviors of higher education students and the changes in these behaviors due to developments in the field of artificial intelligence were examined based on the literature.

Cheating is an important problem that has existed in higher education institutions from past to present (Koç and Memduhoğlu, 2021). It appears in different forms depending on the change in measurement approaches. Cheating in exams, plagiarism and contract cheating are cheating behaviors frequently seen at

the higher education level (McCabe et al., 2001). Studies show that in the last few years, students have made artificial intelligence tools an important part of their cheating processes (Klyshbekova and Abbott, 2024).

The scores obtained because of cheating negatively affect the accuracy of the decisions made about students (Atılgan et al., 2016). Therefore, the existence and frequency of these behaviors cause higher education and related institutions to be questioned and lose prestige. On the other hand, cheating causes great harm to academic integrity, which is an indispensable part of higher education. Where academic integrity is broken, individual, institutional and social degeneration is inevitable (Baijnath and Singh, 2019).

Cheating behaviors are constantly changing depending on educational programs, measurement approaches, developments in technology and artificial intelligence. For this reason, it is of great importance to maintain the continuity of studies that address the solutions to this important problem, which is always up to date, in terms of both reducing the destructive impact of the problem and showing the relevant people and institutions the steps they need to take.

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Educational Innovation of Using Artificial Intelligence in University Education: a Comprehensive Student Survey

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Abstract

This paper investigates the adoption and potential integration of artificial intelligence (AI) within higher education, examining its impact on educators and learners through detailed perspectives gathered from university students. It provides an extensive literature review outlining the dynamics, characteristics, and the application of AI in the educational sector. The primary research included a meticulously designed survey distributed among active students to assess their current experiences, perceived benefits, and concerns having AI-driven materials and tools in educational environments. Based on the learners' responses a generally positive attitude towards the use of AI was revealed among the university students. They expressed a strong belief in their ability to learn with and utilize AI tools effectively, acknowledging the significant advantages AI can offer in enhancing educational experiences and providing personalized academic support. This optimistic view is, however, tempered by significant concerns, particularly regarding ethical issues and the potential shift away from traditional pedagogical methods. The data also showed that the participants highly valued the effectiveness and accessibility provided by the AI-enhanced instructional materials and teaching methods. Despite this, there remained a substantial degree of apprehension surrounding the ethical implications and safety of AI applications in education. This paper makes a significant contribution to the field of educational technology by providing primary research on AI-related challenges and considerations. It highlights the critical importance of maintaining a balanced approach that prioritizes technological innovation alongside ethical considerations and human-centered practices in the development and integration of AI into higher education, advocating for responsible use of technology.

Keywords: Artificial intelligence, university education, innovation.

Introduction

The potential uses and concrete applications of artificial intelligence (AI) have already been explored in a wide range of industries and sectors (Anantrasirichai & Bull, 2022; Corea, 2019). Education is no exception, and with the ever-expanding and deepening use of digital technologies, the possibilities for using AI are becoming more diverse (Zhai et al., 2021). The study of the academic field and AI is of interest, given that the first four decades of the three paradigm-shifting development periods of AI since the 1950s, then 1950-1970, during the 1970s to 1990s and 1990s to 2020s, the majority of basic AI research was funded by the government sector and conducted by the education sector (European Commission. Joint Research Centre., 2020). Before deep diving into the specifics, it is beneficial to review the fundamental concepts and components of artificial intelligence (AI). A widely used scientific definition of AI refers to a field those studies and develops machines capable of intelligent behaviour, particularly systems that typically require human intelligence. Its main components are machine learning, natural language processing, robotics and computer vision. Machine learning enables systems to learn from experience while improving their performance, natural language processing focuses on understanding and generating language data. Robotics applies intelligent machines embedded in the physical world, and computer vision specialises in interpreting visual information (Russell & Norvig, 2016; Goodfellow et al., 2016). In 2018, Chassignol et al. published a study based on literature review focusing on the application of Artificial Intelligence and educational field, which distinguished four different types of impact: the creation of unique educational materials, the creation of innovative teaching methods, the development of technology-enhanced measurement systems, and the creation of new educational technologies (Chassignol et al., 2018).

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Artificial intelligence in education has also undergone significant developments in the subsequent years, with notable advances in accessibility, feature sets, familiarity, and practice acquisition (Chan, 2023). The advent of AI in education has been the subject of considerable publicity, focusing being on the potential benefits for students, particularly in facilitating various examinations and written submissions (Sweeney, 2023). The perception of this has been that it will make the learners' work easier, and where appropriate, the results that can be achieved without learning (Cotton et al., 2024). As a result of this communication, the use of AI has been opposed by many educational institutions and, in several places, explicitly banned and sanctioned (Yu, 2023). Concurrently, this novel and continuously evolving technological approach using artificial intelligence as a technology platform is still in its infancy and is rapidly developing new uses and possible future applications (Yablonsky, 2020). Such an approach is highly pertinent to supporting students' education (e.g. disabled individuals) and enhancing learning effectiveness (Panjwani-Charania & Zhai, 2023; Paiva & Bittencourt, 2020). From another perspective, AI represents a high potential area for teachers and trainers (Celik et al., 2022). With the appropriate preparation and knowledge, these professionals can already provide considerable assistance in facilitating teaching, making teaching more accessible developing interactive and continuously feedback-based learning materials, courses and exams (Lameras & Arnab, 2021). Simultaneously, as with any new technology, the most crucial factor is communicating effectively before implementation, assessing existing knowledge, examining initial user attitudes, and having a conscious, adequately planned, and executed familiarization procedure and learning phase (Owoc et al., 2021). About the relationship between AI and education, in order to make the most effective, beneficial and responsible use of its potential, it is essential that both teachers and students, as well as institutions and regulators, collaborate in a continuous, joint and forward-thinking manner to identify the most appropriate approach to the use of AI, or, where necessary, to the appropriate limitation of certain of its functions and available services (Shao et al., 2020; Tan et al., 2022; Bond et al., 2024). The objective of this research is to comprehensively assess and analyse university students' attitudes toward AI, their opinions on its applications, and their current level of knowledge regarding AI technologies. This assessment was conducted through an extensive questionnaire to a diverse group of active university students from different academic disciplines. The survey aims to provide a deep understanding of the extent to which students perceive the use of AI to be acceptable in educational contexts, considering perspectives from both students and teachers. It explores students' beliefs about AI integration's potential benefits and drawbacks in their learning environments.

Literature review

AI and education can be reviewed using several different approaches. The most evident starting point is the overview of how adaptive learning systems have evolved, the usage of chatbots, how AI stepped into the analytics field, and how it has achieved significant development within automated administrative services. Another perspective is the pedagogical implications, having an enormous impact not just on the students' engagement but also on the teachers' part concerning teaching methodologies, techniques, and even teaching materials. Rather than getting into full details about the above topics, this research focuses mainly on the practical approach, challenges, and concerns of integrating AI into university education using a narrowed literature review methodology and a survey evaluation. A ten-element list of the key characteristics of AI's advantages and disadvantages in higher education summarizes the result and the comprehensive summary of the review of the academic works.

The literature review was performed based on Scopus database academic works. The research plan structure has been built upon the following structure: As a starting point, the documents result of using keywords search (TITLE-ABS-KEY (artificial AND intelligence*) AND TITLE-ABS-KEY (university*) OR TITLE-ABS-KEY (higher AND education*) AND TITLE-ABS-KEY (disadvantage*)) was used to conduct an analysis of the coverage of the topic, by number of academic works, trend. It was continued with additional Keyword searches for a) advantage* and b) disadvantage*, enabling the analysis of the explicit details of advantages/disadvantages within the document list. As a third activity, keyword occurrence extraction for a) advantage* and b) disadvantage* was performed to identify keywords associated with a) advantage* and b) disadvantage*. As a result, a list of the main characteristics of advantages and disadvantages of using AI in higher education was created and summarized using an in-depth literature review.

As of June 2024, 15,985 documents have been identified, showing almost continuously increasing numbers of published academic works since the earliest record in 1911. The period from 2015 onwards marks a significant phase of rapid growth in publications, as detailed in Table 1. In 2015, there were 320 publications. Based on interpolation from the existing data, it is estimated that by 2024, there will be 3,692 academic works indexed in Scopus, representing an astonishing 11.5-fold increase. Alternatively,

considering the year-over-year average growth rate of approximately 28.75% over the past ten years, the sustained growth of the publication corpus highlights a profound and enduring interest in the subject. This growth rate not only reflects substantial interest but also reflects the value and potential for future investment in research and academic works.

Furthermore, the scoping review focuses on the subject field's advantages and disadvantages, whereas the following qualification procedure has resulted in 735 documents for advantages and 111 documents for disadvantages.

Table 1. Scopus indexed publications in the given subject field for keywords: advantage* / disadvantage*

Advantage	No of documents	Disadvantage	No of documents
E-learning	72	Privacy	2
Active Learning	23	Quality Control	2
Teaching methods	17	Security	2
Distance Education	15	AI-ethics	1
Knowledge Management	13	AI-generated Content	1
Competitive Advantage	11	AI-reliability	1
Information Use	11	AI-transparency	1
Optimization	11	Accessibility	1
Efficiency	8		
Student Performance	7		
Evaluation	6		
Accuracy	6		

Source: Scopus.com database keyword occurrence analysis for the above given keywords

As shown in Table 1, based on the keyword occurrence analysis, a significantly low number of keywords identified directly linked to the advantages and disadvantages of using Artificial Intelligence in University Education. Notably, there is almost a seven times higher number of Scopus-indexed articles focusing on the advantages rather than the disadvantages of AI usage in higher education. Reviewing the respective articles and additional academic works, the following five advantages and disadvantages have been identified:

Table 2. Collection of main characteristics in the given subject field for advantages and disadvantages

Advantage	Disadvantage
1. Distance Education Option	1. Privacy and Ethical concerns
2. Enhanced Personalized Learning	2. Quality of AI generated content
3. Improved teaching, evaluation methods	3. Accessibility and equality
4. Improved administration	4. Technology reliability
5. Improved Student Services	5. Transparency

Source: reviewed articles, table: author's work

Advantages of AI in higher education

In examining the five top-rated advantage elements, it is essential to consider their strong interaction. However, it is also important to analyse some of the main features for all of them, as the focus required for each topic may differ depending on the specific institutional situation, course, or class. Furthermore, the study reveals that the usage of AI can be tailored to the individual learner level. One of the principal advantages of incorporating AI into the higher education environment, as evidenced by the findings of the scoping review, is the option of distance education. This structure for accessing remote educational materials and courses existed before the advent of AI, but there appears to be a significant connection between these two subjects. The distance learning option has evolved in response to the challenges derived from the global pandemic (Alqahtani & Rajkhan, 2020). The application of AI in education in distance and online learning environments has enabled universities to enhance efficiencies in institutional and administrative services (Sharma et al., 2019). From the perspective of students, it is claimed that AI support enables highly customizable learning services in hybrid, remote or e-learning environments, with no personalized connections with teachers (Gao et al., 2021). Personalized learning can be enhanced using several elements, which depend on the university's capabilities, the needs and opportunities of the student, and the institutional and government-regulated environment. The research identifies two main groups of building blocks: one set is related to the personalization of subject matter and learning

materials, and the other set is linked to the way of learning, structure, and framework. The first group, personalization, can be further enhanced with the help of AI, allowing for the creation of customized content for each student and class (Pratama et al., 2023). It is evident that the curriculum must continue to include the mandatory elements (Dečman, 2015). However, with the flexibility afforded using alignment possibilities to students' interest, base or prior knowledge, and progress, it is possible to create and utilize more engaging and relevant materials and to run courses and entire learning paths with increased motivation and retention (Bates et al., 2020; Huang et al., 2023). In conjunction with personalized content, personalized assessments are available when AI forms the basis of the learning system (Hooda et al., 2022). Artificial intelligence is a critical enabling technology for creating adaptive assessments that align with learners' knowledge levels and desired learning outcomes (González-Calatayud et al., 2021). It plays a pivotal role in maintaining interest and dedication through its ability to provide almost real-time evaluation and self-adjusting monitoring (Luan et al., 2020; Fernández Herrero et al., 2023).

The other set of advantages refers to the education framework, specifically the teaching and evaluation methods, the advanced semi-complete automated administration, and the perception of recognizable improvements in student services. From a teacher's perspective, AI can be seen as the greatest threat ever, an opportunity for evaluating teaching to the next level, or both simultaneously (Pedro et al., 2019; Kuleto et al., 2021). The risks and challenges referred to in the next chapter and the disadvantages of using AI in higher education are discussed. One great value of AI is the customization of subject materials compared to the invested time and resources needed (Ingavelez-Guerra et al., 2022). Having a good base material and a proper instruction set for an AI tool, the creation of customized, even personalized content is a matter of seconds. It not only offers differentiation in content but can also consider students' knowledge levels, preferences, and learning styles (Bajaj & Sharma, 2018; Al-Zahrani, 2024). The customization ensures that all learners receive the most relevant and supportive resources. Such personalization of materials led to enhanced student engagement, offering more active participation, better results, and a more profound commitment toward continuing studies (Ouyang et al., 2022). Over personalized course content with the help of AI, the whole educational system can be extended to an adaptive learning environment, actively seeking and responding to the needs of individual students (Maghsudi et al., 2021). The structure can adjust the pace, style, and content based on real-time analysis of learners' performance, feedback, and progress. Such adoption needs high-level automatization, continuous real-time grading and assessment system(s), learning analytics, and a data-driven approach within the university's operational model (Swiecki et al., 2022).

In addition to enhanced pedagogical techniques, an AI-driven educational framework offers innovative and high-performance evaluation methods. These methods introduce almost real-time, immediate response and result-generating tools, extensively utilising statistical models to evaluate individual students' knowledge levels against group averages over time (Jain et al., 2014). This profound understanding and management opportunity significantly enhances learning efficiency, which can only be achieved with an automated, data-driven approach. The possibility of utilising the same data set and processing tools allows for the measurement of the progress of individual students, as well as the development of groups or cohorts, against previous groups or predefined expectations. This capability automatically adjusts learning journeys, designed to meet specific objectives at both the personal and class levels (Somasundaram et al., 2020).

The data-based computerised and automated multi-layer information flows enable immediate responses and improved operational administration within the higher education sphere, which is accessible and usable for students, teachers, institutions, and even central government administration. The application of artificial intelligence in university education encompasses a range of functions, from automated admission procedures to enhanced collaboration options (Ahmad et al., 2022). AI-powered systems can be employed in scheduling and rescheduling classes, exams, and other university events and can even be used to monitor attendance. Regarding student services, AI can be utilized to provide personalized assistance through chatbots and AI assistants (Villegas-Ch et al., 2020). These systems can offer general support on a 24/7 basis and can also provide personalized responses to specific inquiries. Algorithms can assist scholars in analysing their performance, offering flexibility in creating and adjusting learning pathways (Vo et al., 2022). They can also proactively analyse expected results and provide additional supporting materials in subjects where extra investment is needed to achieve targeted grades and performance.

Disadvantages of AI in higher education

One of the most significant concerns regarding the utilisation of AI in any given field is the issue of privacy and ethical considerations, which must be addressed to ensure this technology's responsible and ethical use. All computerized systems require data, utilizing automated algorithms for status information,

process management, and self-improvement learning. The implementation of AI-based solutions in university education and operations exemplifies this. Such activities depend on extensive data collection, analysis, and production, resulting in a continuous and growing demand for data, including highly confidential personal data (Curzon et al., 2021; Nguyen et al., 2023). The potential for data breaches, data leakage and manipulation of data, and unauthorized access to databases containing personal, financial, and other information represents a significant risk to both students and institutions (Li et al., 2023). Furthermore, ethical considerations are also related to students' and teachers' awareness and explicit approvals regarding data collection and data usage practices. In this context, it is imperative that appropriate ethical standards and regulations, such as the EU GDPR, are adhered to (Jones, 2019). These require informed consent practices where all stakeholders are fully informed about how their data is used and protected. They are offered the option to accept or decline such personal data management processes. As with all forms of technology, AI systems are not infallible and may contain certain levels of bias. Such errors may derive from teaching data, test data, or even from the models themselves. Unfortunately, there is evidence that bias may lead to discriminatory practices. It is, therefore, of the utmost importance to ensure that the models and algorithms in question contain the least possible bias in critical fields and focus on preventing unfair treatment (Bonezzi & Ostinelli, 2021).

A further area of concern is the quality of the AI-generated content. As the utilization of AI for the creation, modification, and review of written and verbal materials and videos has expanded, it has become apparent that the quality and usability of such content can exhibit considerable variability. It has led to growing concerns about the accuracy, reliability, and consistency of the content generated by AI (Chen et al., 2023). As a program is constrained by the instructions it has been programmed to execute, the output is not only dependent on the algorithms but also on the programmer in a manner analogous to the role of the university teacher in the context of higher education (Ouyang & Jiao, 2021). It can be reasonably assumed that the more an instructor can program and initiate processes and work requests from AI, the greater the likelihood of achieving a high-quality and consistent output. It is currently not possible for AI-generated content to demonstrate the same depth of understanding or critical approach to a given field as that of a human professor. Furthermore, there is a potential risk that AI-based systems produce materials that are not fully aligned with the relevant academic fields, even if they provide misleading information. It is, therefore, of the utmost importance to implement continuous control and measurement procedures to check and adjust content to ensure its relevance and validity (Wu et al., 2023). As is the case in any field that affects human beings, the topics of accessibility and equality are of great concern in the academic environment. Adopting AI in higher education will inevitably further increase existing inequalities among students who lack equal access to knowledge, technology, and connectivity. These disparities must be subjected to rigorous examination, addressed and managed by institutions, with the provision of continuous support for any groups that may be disadvantaged. In addition, AI systems should be designed and used for the diverse needs of students, including those with disabilities (Mehigan, 2020). This situation necessitates utilizing assistive technologies and providing alternative formats for content consumption and creation. Furthermore, the issue of affordability is closely linked to accessibility, not only at the level of individual students but also in the context of a comparison between different universities and institutions. It is critical to address the potential outcomes of widening the gap between students of well-financed and limited resource-based universities by making AI tools more affordable and accessible for all.

The majority of AI is informatics, whereas technology is critical. Every system based on mechanics and computer logic has the potential threat of system failures, malfunctions, or even complete damage. The more critical educational factors and functions are dedicated to AI structure, the more significant the impact of the technological disruption can be in case of critical events. Institutes can handle this risk and build appropriate mitigation techniques by having robust, scalable, and DR-ready infrastructure, backup sites, and recovery procedures in place. The effective utilisation of AI tools and AI-backed procedures necessitates the presence of continuous technical support for learners, teachers, and administrators. Universities must invest in ensuring 7/24 accessibility to support in the form of infrastructure, such as a call centre, chatbot, service desk, and the provision of skilled personnel (Villegas-Ch et al., 2019). The user training aspect is arguably the most crucial of all the elements in the technology view. Teachers, students, and any party utilising AI tools must undergo proper and continuous training and skill development (Jurs et al., 2023). Such knowledge is necessary for even the most optimal system to perform at its full potential, the potential can be realised, and the likelihood of bias and misuse is increased. Finally, it is essential to note that two specific areas have emerged in AI: interpretable AI and explainable AI (XAI). Such expressions can be used to describe approaches, procedures, and tools that assist users in comprehending and interpreting the work of AI (Linardatos et al., 2020). Transparency is paramount for comprehending algorithms, decision-making processes, and outputs, thereby fostering trust in AI systems. Accountability

is also a significant aspect of transparency, encompassing who is responsible for the operations, decisions, and outcomes generated by AI tools and systems. The field of AI is complex, and, as with many other areas of AI, education is undergoing continuous improvement. Difficult discussions and debates accompany this. The guidance and essence of transparency refer to AI's ethical and inclusivity requirements, which generates a massive demand for well-defined ethical principles to be adopted by AI-driven systems. Such theoretical approaches must be rigorously introduced, maintained, and supervised, primarily through explicit governing policies (Cath, 2018).

Research methodology

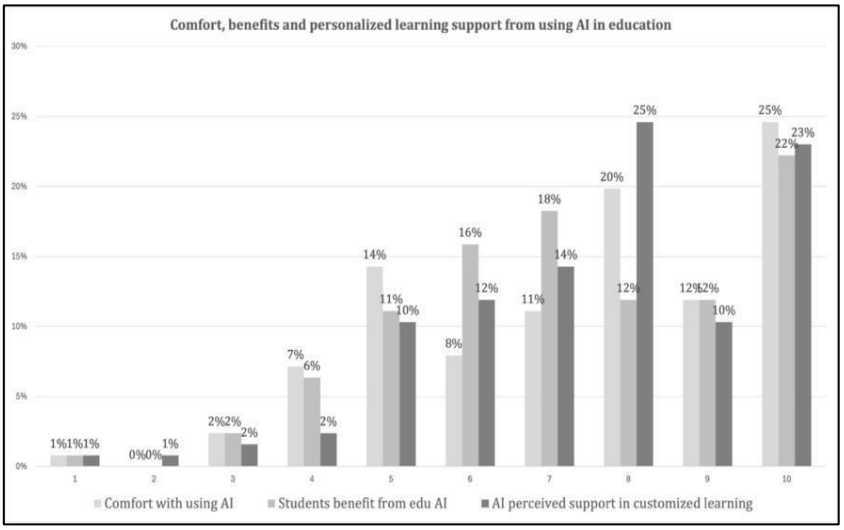
Above the formerly shown literature review research, a 15-item specific questionnaire was designed to assess students' attitudes toward AI, previous experiences, expectations, future beliefs, and possible concerns. Typical scaled questions ranged from 1 to 10, where 1 meant extremely disagree, 5 and 6 were considered neutral, and ten meant extremely agree. The scale has been divided into three categories: 1-4 rates: negative attitude, 5-6 rates: neutral attitudes, and 7-10: positive attitude. This structure allowed for the exploration of both positive and negative attitudes. 126 students completed the questionnaire from seven Óbuda University Keleti Károly Business and Management Faculty courses during class, including 32 international learners. The sample was limited due to its reach of learners, and the trade-off to using an anonymous questionnaire was the high number of fill-outs while giving off the exact demographics' evaluation possibility. It can be stated that the approached courses were 4 BA and 3 MSc, with first-year and second-year students. Their experience with AI tools was limited. The surveys were completed during in-person classes, with an introduction to the topic and information about the questionnaire. All participation was voluntary, questionnaires were anonymous, and informed consent was gained from the learners.

Besides descriptive statistics, an ANOVA analysis was conducted to reveal whether there are significant differences in the levels of further use and approach to AI between individuals with and without prior experience using AI in education. Due to space limitations, only the summarized version of the most important results is presented in this research.

Results and evaluation

Analysis of the survey data provided insightful findings about students' attitudes toward AI in education. Most importantly, students have a solid and clear opinion about the comfort level of using AI in their learning journey. Notably, 90% of all responses were neutral or above, with 25% of respondents falling into the 'extremely comfortable' zone. It indicates a high level of interest in the subject, even though almost half, 44% of students, have no experience using AI in an educational environment and, according to their perception, they have some knowledge about general AI technology. 91% of students thought they would benefit from using artificial intelligence tools and systems in the university environment.

Figure 1. Students' opinion on comfort, benefits and personalized learning support using AI in education
Source: author's research, n=126

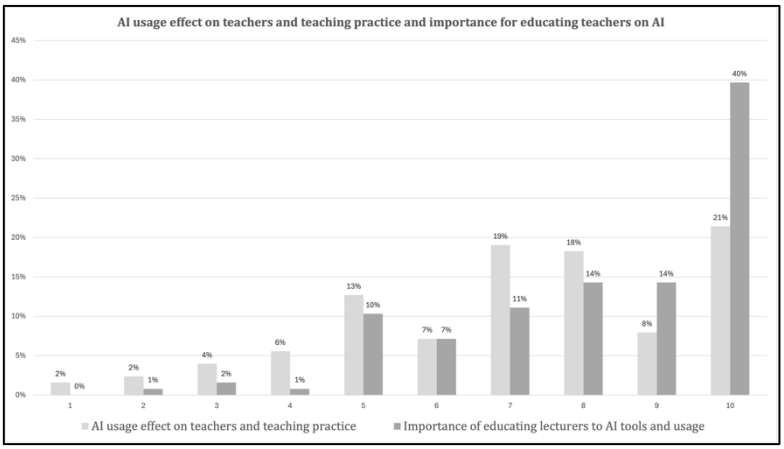


Focusing on the opportunities and benefits that AI would offer them, from a given list of items and open options, the results were: a) personalised learning experience 58%; b) increased student engagement 45%; c) improved learning outcomes 40%; and d) streamlined administrative tasks 33%. Interestingly, improvements in learning outcomes were only in third place, with data showing that students are more interested in personalised and engaged activities in their education. Asking about what the respondents think is a general attitude towards AI usage in education, based on the feedback, more than 92% of the scholars think that other university students would have at least a neutral attitude towards using AI in a classroom environment. This result strongly resonates with their behaviour towards the field.

ANOVA test was conducted to examine if former AI experience influences a) comfort in the use of AI in education, b) the perception of how participants see their self-adoption capabilities in using AI in education, c) AI's capability to support diverse education and d) their interest towards learning more about AI. There were two main outcomes. First, the means for the investigated factors were all above 7, showing that the participants have overall positive attitudes towards AI. The second result was that the students' former experience with AI had a statistically significant impact on the other examined factors with an extremely low p-value ($P=3.47\times10^{-130}$), supported by the F-statistic of 208,83 and the large effect size ($\eta^2=0.628$). Based upon the above, it can be confidently stated that prior AI experience plays a significant role in further comfort in using AI, future self-adoption perception to AI-support educational environment, AI's capability to support diverse education, and the interest towards learning more about AI.

As university educational measurements and learners' results are also highly related to the teacher's and lecturers' skills, knowledge, and educational framework, the questionnaire also tapped into this topic of AI usage. Almost three-quarters of survey participants indicated that AI usage would positively impact teachers' and teaching practices, out of which almost 30% voted for a highly and extremely positive effect level. Using a direct question regarding the importance of introducing AI knowledge for the teachers to enable them to use it within classroom activities, 97% of the neutral and positive answers were registered, with 54% on the two highest scales of extremely and highly important. Those results are graphically presented in Figure 2 and show a strongly expressed requirement and message towards universities to arm teachers and teaching environments with AI capabilities and offer AI-backed-up materials, classroom activities, and related services.

Figure 2. AI effects on teachers, teaching and the importance of educating teachers about AI
Source: author's research, n=126

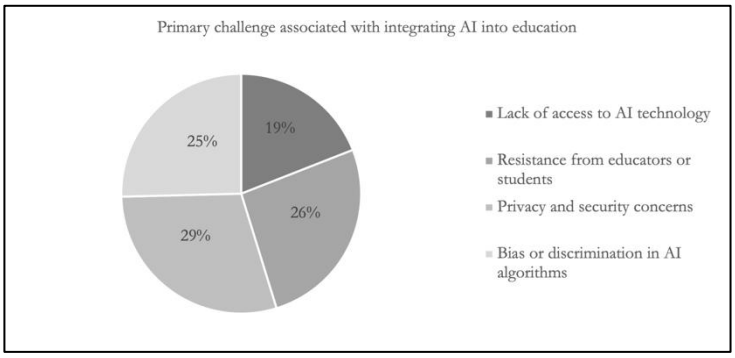


The research also asked for students' views on the challenges of AI within education. 92% reported that they would be able to adopt an AI-supported educational environment, 47% being in the upper quadrant of the scale with a strong positive attitude. Also, 94% think AI would help support diversity, inclusivity, and different learning requirements for students in their higher education. Participants had not differentiated the primary challenge of integrating AI into education to such extent as they have evaluated the need or the adoption rate of AI. The four different aspects of the challenges presented in Figure 3 were almost valued to the same weight, around 25% ranging from 19%-29%, where lack of access to technology was the lowest, strengthening the view that the Hungarian higher education system is seen to be able to provide the accessibility for necessary infrastructure and the highest score, 29% was about privacy and security concerns. That almost balanced approach reflects not having enough experience in the field from personal perspectives and a systematic awareness of all possible huge impact factors that

can influence AI use in universities and the general landscape. As of entering to the last chapter of the research focuses on the perceived adoption capabilities of the learners and the view on how AI would help in addressing learning gaps and provide support to students with diverse learning needs. 93% of answers reflected a neutral and high confidence within the participants that they could adapt to AI-driven educational environments. 94% of votes were neutral or optimistic about how AI can help inclusivity and support diverse learning needs.

Evaluating the briefly summarized results based on the novelty of the extensive use of AI tools and methods in higher education, future studies should evaluate the long-term impact of AI integration on student performance and engagement, utilizing both qualitative and quantitative methods to capture a comprehensive picture. It would be also beneficial to conduct long-term research for observing the changes in student attitudes and learning outcomes over time, providing deeper insights into the evolving role of AI in education.

Figure 3. Primary challenge associated with integrating AI into education
Source: author's research, n=126



Conclusion

There are several key findings from the research. First, and perhaps most importantly, a significant majority of students, regardless that it can be stated that former AI experience is significantly influences other factors in using AI, expressed neutral to highly positive attitudes, with topping at an extremely positive peak towards the comfort and acceptance of AI usage. That result indicates an open-minded approach toward AI and predicts a possible acceptance of a seamless integration of AI in educational environments. The research proved that students view AI as a valuable tool in their academic journey, showcasing some specific scenarios and subjects where they believe AI can significantly enhance learning experiences and results, with an explicit answer of having strong confidence in adopting AI-driven educational environments. The research also revealed that students are interested in learning in artificial intelligence-supported classes and are eager to participate. Also, they firmly believe that AI would help with inclusivity and make students' progress easier with diverse learning needs. The main challenges associated with the field have not significantly differed; the survey also proved the main elements of advantages and disadvantages resulting from the literature review.

Turning the view onto the other side, the respondents expressed that AI usage would significantly positively affect teachers' work and recent educational practices. Most answers suggested that it would be essential to provide training for teachers about the efficient usage of artificial intelligence for applying it in classroom practices. This strong belief in the importance of AI knowledge for teachers reflects a recognition that effective AI integration depends heavily on educators being well-versed in these technologies. It immediately calls for professional development and teacher training to maximize the benefits of AI in the classroom.

This research, having built upon a comprehensive approach including actual literate review, identification of main advantages and disadvantages, and delivering a primary questionnaire research, provides insight into current student attitudes and helps understand the broader implications of AI in higher education. It ultimately alerts and showcases universities, institutions, and teachers integrating AI tools into their daily teaching operations. Operational fields have started to grow into an expectation from the learner's side. As AI is already within and outside the walls of educational institutions, the best solution is for universities to invest in understanding and evaluating the opportunities and challenges that

AI reveals. They must prepare themselves to step ahead with a proactive approach and implement immediate actions for integrating AI practices within and outside the walls of their institutions, as it is usually better to be in the lead than to miss the opportunity and fall behind in the competition for new students, satisfied learners and then Alumnus and better-performing organization.

Plagiarism Statement
Similarity rates of this article was scanned by the Turnitin software.

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