Australian Journal of Teacher Education

Volume 46 | Issue 6 Article 4

2021

The Mediating Role of Self-Directed Learning Readiness in the Relationship Between Teaching-Learning Conceptions and Lifelong Learning Tendencies

Kasım Karataş
Karamanoglu Mehmetbey University, Turkey

Cihad Şentürk
Karamanoğlu Mehmetbey University, Turkey

Aziz Teke
Karamanoglu Mehmetbey University, Turkey

Recommended Citation

Karataş, K., Şentürk, C., & Teke, A. (2021). The Mediating Role of Self-Directed Learning Readiness in the Relationship Between Teaching-Learning Conceptions and Lifelong Learning Tendencies. *Australian Journal of Teacher Education, 46*(6).
http://dx.doi.org/10.14221/ajte.2021v46n6.4

The Mediating Role of Self-Directed Learning Readiness in the Relationship Between Teaching-Learning Conceptions and Lifelong Learning Tendencies

Kasım Karataş
Cihad Şentürk
Aziz Teke
Karamanoğlu Mehmetbey University, Turkey

Abstract: In this study, the mediating role of readiness for self-directed learning in the relationship between pre-service teachers' teaching-learning approach and lifelong learning skills was examined. The study group consisted of 800 pre-service teachers studying in different universities in Turkey. Data were collected with three different scales. The analysis of the data was carried out using structural equation modelling. According to the findings obtained and the results of the mediation analysis, it is clear that the readiness of self-directed learning in the relationship between constructivist teaching-learning, which is one of the learning teaching approaches, and lifelong learning tendencies has a full mediating role. However, there was no significant relationship between traditional teaching-learning approach and lifelong learning tendencies and readiness for self-directed learning. As a result, the type of learning-teaching approach affects readiness for self-directed learning and therefore lifelong learning tendencies.

Key Words: Constructivism, lifelong learning, self-directed learning, teacher education

Introduction

In this century, an information-based change and transformation takes place with the combined effect of social, economic and technological developments (Reischauer, 2018; Roztocki et al., 2019). As a matter of course, this change and transformation occurring in the world also affects education systems. New scientific studies on technological developments, increasing globalization and teaching-learning approaches are the natural result of change and transformation in education (Miller et al., 2009). These changes in the information age affect the education systems and concepts such as education, school and learning are redefined (Biesta, 2016; Council of Europe, 2015). When the education systems of the countries that stand out in education with their success in international exams (PISA, TIMSS, PIRLS etc.) and contemporary education practices, it is seen that teachers in these countries have a contemporary, student and learning-centred teaching-learning approach instead of traditional teaching-learning conceptions (OECD, 2016). In this regard, it is very important to train pre-service teachers studying in the faculties of education with a contemporary teaching-learning approach, lifelong learning tendency and self-directed learning skills in line with the changes and transformations that took place in the 21st century.

When the literature is examined, two opposing types of teaching and learning conceptions are mentioned. These concepts are; traditional / behaviourist / teacher or subject-centred teaching-learning approach and contemporary / constructivist / student or learning-centred teaching-learning approach (Samuelowicz & Bain, 2001). Constructivist teaching-learning conception and traditional teaching-learning conception often conflict. Because the constructivist teaching-learning conceptions emphasizes the creation of active learning environments that allow critical thinking, discovery, collaboration and learning through experience, while the traditional teaching-learning conception sees the teacher as the source of knowledge and the students as passive information recipients (Chan & Eliot, 2004). On the other hand, countries in the changing world determine their educational policies according to contemporary educational philosophies and approaches and create their curriculum accordingly. However, the success of these modern educational policies and curriculums put forward is directly proportional to the extent to which teachers apply these policies and curriculums in educational settings. In this respect, it can be stated that teachers' having a contemporary (constructivist) teaching-learning approach will be an important factor in education's prominence and success.

In the 21st Century skills called "21st Century skills" have become prominent rather than knowledge of specific subjects or learned knowledge (Boholano, 2017; Karatas & Zeybek, 2020). 21st century skills include learning and regeneration skills, learning to learn, managing metacognition, lifelong learning and self-directed learning skills (Javed et al., 2019). In this respect, it is very important for teachers and pre-service teachers who implement education policies and curriculums in practice to have lifelong learning and self-directed learning skills defined as "managing the individual's own learning process" (Brockett & Hiemstra, 1991, p. 29; Brookfield, 2009, p. 2616; Knowles, 1975, p. 18). In this regard, in this research, the relationship between teacher-learning conceptions and lifelong learning tendencies of pre-service teachers who will become teachers of the future was examined and it was considered necessary to examine whether or not self-directed learning has an intermediary role in this relationship.

Literature Review

Teaching-Learning Conceptions

Teaching-learning conceptions can be defined as "teachers' beliefs about the roles that teachers and students undertake in the teaching-learning process and the teaching-learning paths they prefer" (Chan, 2003, p. 36, 2004, p. 1; Prawat, 1992, p. 356) and it includes beliefs, the meaning of teaching and learning, and the roles of teachers and students (Chan & Elliot, 2004). In other words, the concept of teaching-learning conception can be seen as an umbrella term that expresses the teacher's values, beliefs, attitudes, intentions and practices for learning and teaching (Baş & Şentürk, 2019). The developments in the field of educational sciences brought the difference in teaching-learning approach. In this sense, it can be said that there are two different general teaching-learning conceptions that are in opposition to each other in education (Schunk, 2012). These insights compiled from the literature are presented visually in Figure 1.

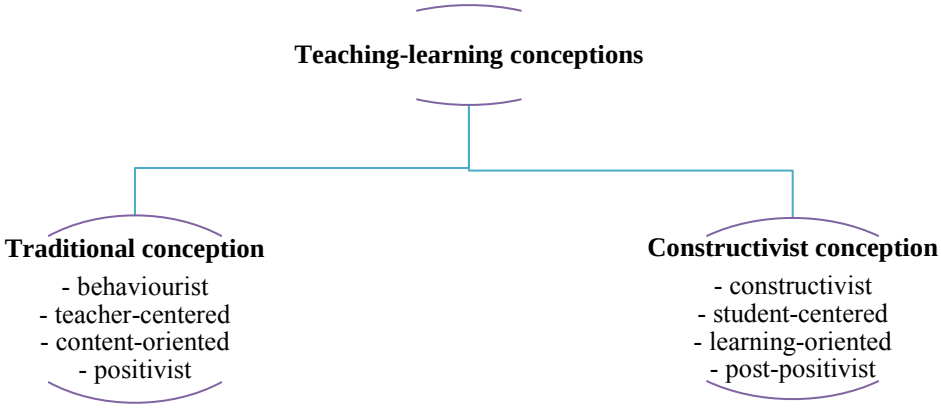

Figure 1. Teaching- learning conceptions in the literature

In the traditional teaching-learning conception, students are passive. This understanding does not care about students' needs, expectations and individual differences. In this understanding, students' interests, skills, abilities, cognitive and affective input behaviours, etc. are not taken into account. Each individual is presented with the same teaching process (Schunk, 2012). Students take the information conveyed by the teacher without questioning and memorize it. This understanding expects the student to find the "correct" answer rather than thinking. Communication in the classroom is one-way from teacher to student. Instruction is carried out with teacher-centred teaching strategies (Khalid, & Azeem, 2012; Kim, 2005). The role of teacher in traditional teaching-learning conception is to provide students with open and resolvable problems, to explain the ways of solving problems, to provide silence and focus in the classroom, and to transfer the information to the class in an open, understandable and structured way (Chan, 2004). As can be understood from all these expressions, traditional teaching-learning conception is an approach in which the learning-teaching process is based on the teacher. Another teaching-learning approach, which is based on the theories of Dewey (1916), Piaget (1973) and Vygotsky (1978), is the constructivist teaching-learning approach. According to the constructivist teaching and learning conception, the student is not passive / inactive and plays an active role in learning processes. In this understanding, individual differences are taken into consideration by considering students' interests, needs and expectations (Zabihi & Khodabakhsh, 2019). According to this understanding, students take the responsibility of learning and actively participate in the learning process and are responsible for their own learning. The teacher is a guide in the classroom who supports the students' sharing and discussions with their friends without hesitation, creates an environment where they feel safe, helps students in the structuring of information and guides the learners in the learning-teaching process (Brooks & Brooks, 1999; Driscoll, 2004).

Self-Directed Learning

One of the aims of education systems and schools today is to enable learners to direct their learning processes outside the existing school structure. Schools should offer flexible learning environments that enable learners to take self-responsibility, self-learning, managing self-learning processes, self-evaluation by enabling students to take responsibility for learning (Derric, 2013). This skill, which includes the ability of learning to learn, is actually

the basis of lifelong learning. In addition, the ability of learning to learn is accepted as one of the basic principles in the implementation of self-directed learning (Black et al., 2006).

Self-directed learning is described in the most general sense as an individual managing his own learning process (Karatas, 2017). According to Knowles (1975), who conducts important studies and research on self-directed learning, self-directed learning is the process of taking responsibility for learners to plan, implement and evaluate their own learning needs and results with or without the help of others. More broadly, self-directed learning is defined as the process of defining its own learning needs, establishing learning objectives, determining human and material resources for learning, choosing the appropriate learning strategy for the information to learn, and evaluating the implementation and learning outcomes (Hiemstra, 1994; Towle & Cottrell, 1996). Self-directed learning is the responsibility and self-management of the individual's learning. This management integrates self-management (management of the context, including the social setting, resources, and actions) and self-monitoring (the process whereby the learners monitor, evaluate and regulate their cognitive learning strategies) (Bolhuis, 1996; Garrison, 1997).

Self-directed learning is in the same line with lifelong learning. Because individuals today have to continue learning throughout their lives, independent of a formal educational environment (James, 2008). Individuals must have self-directed learning skills in order to be successful in the lifelong learning process (Bolhuis, 2003). Because individuals need to be able to plan, execute and manage their own learning process in order to perform lifelong learning, the importance of which is mentioned above, that is, they must have the skill of self-directed learning. As a matter of fact, one of the eight basic competencies that the European Union Education and Culture Commission deems necessary for lifelong learning is "learning to learn", ie self-directed learning skill (European Commission, 2019). It can be stated that as lifelong learning individuals teachers or pre-service teachers who can self-organize and manage their own learning, develop themselves by meeting their own learning needs; hence learning to learn, having self-managed learning skills can apply these developments in their professional life by following the developments in learning and teaching approaches.

Lifelong Learning

Education, in its broader scope, covers a process that starts with birth and continues throughout life. Scientific studies in recent years reveal that this process started with prenatal (pregnancy period) (Allen & Kelly, 2015). Especially in the 21st century, rapid changes and transformations in line with the changing life conditions and new needs brought by the age have increased the importance of lifelong learning, and the development of the knowledge, skills, abilities and qualities required for effective lifelong learning has emerged as a basic life skill for individuals (Deakin-Crick, 2005; Yuksel et al., 2016). Lifelong Learning is defined by The European Lifelong Learning Initiative as "an ongoing supportive process that encourages individuals to acquire all the knowledge, values, skills and understandings they need throughout their lives and to apply them with confidence, creativity and joy in all roles, conditions and environments" (Watson, 2003, pp. 2-3). According to another definition, lifelong learning is the ability of continuous learning, where the individual gains new knowledge and experiences by preserving the previously acquired knowledge skills and experiences (Parisi et al., 2019). In addition, lifelong learning is stated that it covers all common, natural and continuing learning activities for the development of knowledge, skills and competencies related to personal, social or professional perspective (European Commission, 2019). Now in the 21st century the knowledge and experiences learned at school are not sufficient in the individual's life ahead. Especially during the last fifty years,

continuous scientific and technological innovations and changes have had a profound effect on learning needs and styles (Ates & Alsal, 2012). Accordingly, in the light of these developments, the understanding and forms of learning and teaching are also changing. It can be said that only teachers / pre-service teachers who have a lifelong learning tendency can catch this change, which also occurs in the teaching and learning processes. Because teachers or pre-service teachers who are conscious of constantly improving and renewing themselves with a lifelong understanding, will adapt to it by accepting change more easily (Gencel, 2013; Longworth, 2003).

In today's educational environments, responding to the interests, needs and expectations of students and revealing their talents are among the requirements of modern education understanding (OECD, 2012; Tomlinson, 2014). Education programs must be open and flexible, both to meet the diverse interests and needs of students and to develop various competencies in students. It is very important for teachers to develop themselves professionally and become lifelong learners by following contemporary educational practices in order to provide education that meets the needs of individuals with open and flexible education programs (Ouane, 2008). Especially in today's world where traditional education methods have undergone a great change, it can be stated that teachers depend on their lifelong learning in order to follow contemporary learning-teaching approaches / understandings, to integrate technology into teaching processes, in short, to realize change and transformation in accordance with the conditions of the age (Avis et al., 2019; Dhaliwal, 2015). In addition, teachers' having lifelong learning competencies will enable them to perform their role as mediators in providing social change that is attributed to them (UNESCO, 1996).

It is extremely important for teachers to have lifelong learning skills in order to ensure social change and transformation and to train students as individuals equipped with the qualifications required by the age. Teachers who have internalized lifelong learning are needed to create lifelong learning societies (Braun et al., 2020; Coolahan, 2002; UNESCO, 2015). Chapman et al. (2003), touching on the significance of the importance of teacher education in reaching lifelong learning societies, emphasizes the necessity of developing lifelong learning and constructivist approach implementation competencies in the education of prospective teachers. In his study, Şahan (2020) revealed that there is a relationship between pre-service teachers' educational beliefs and lifelong learning tendencies. According to the result, a negative relationship was found between lifelong learning tendencies and permanent and essentialist education beliefs, and a positive relationship between progressive and reconstructive education beliefs. In this context, it can be stated that teachers who tend to learn lifelong will have contemporary educational beliefs and learning-teaching conception.

Theoretical Background and Research Questions

When the literature is examined, it is seen that the level of self-directed learning of individuals has an important effect on lifelong learning tendencies and that these skills will also affect their teaching - learning conceptions. Boyer et al. (2013), in their meta-analysis study conducted with studies on self-directed learning in multiple academic disciplines in five different countries in the last 30 years, revealed that self-directed learning will improve individuals' lifelong learning skills. In their study, Saritepeci and Orak (2019) concluded that one of the most important predictive variables of pre-service teachers' lifelong learning tendencies is self-directed learning. As a matter of fact, in many sources in the literature, self-directed learning is expressed as the key concept, basic element and cornerstone of lifelong learning (Chuprina, 2003; Fischer & Sugimoto, 2006). According to Candy (1990), self-

directed learning is a way of transforming individuals into lifelong learners. On the other hand, one of the main purposes of lifelong learning is to equip individuals with skills and competencies that enable them to learn on their own. According to this belief, self-directed learning is both the meaning and the result of lifelong learning outcome (Candy, 1990). Within this framework, it can be stated that there is a close relationship between self-directed learning and lifelong learning.

Developments in the world have created the concept of lifelong learning, the importance of lifelong learning has emerged and various steps have been taken regarding lifelong learning in this context. For example, year 1996 has been declared as the European year of lifelong learning, UNESCO has included lifelong education as one of the main issues in planning, and G7-G8 countries have identified lifelong learning as the main strategy in combating unemployment (Fischer, 2001). In the light of these developments, lifelong learning started to guide education policies and took place in education programs. One of the main goals of education has been to raise individuals who have acquired lifelong learning skills (Demirel, 2009). In this direction, there have been changes regarding the concepts of teaching, learning and teacher, and new perspectives and understandings have been brought to these concepts, especially in line with the requirements of the 21st century.

The rapid changes in science and technology in the 21st century have also affected the education systems. In addition, new definitions regarding the concepts of education, school teaching, learning, and teacher have been introduced, the need to reconsider the aims and content of education, teachers, curriculums, the teaching process, as well as the role of the school as a learning organization has emerged and new theories, models, approaches and new paradigms have emerged in this direction. (Council of Europe, 2015; OECD, 2018; Reigeluth, 2012; Scott, 2015). In this context, 21st century approaches aim to develop lifelong learning skills (constructivist approach, brain-based learning, quantum learning, differentiated teaching, blended learning, STEM education, cooperative learning, inquiry-based learning, reflective learning, etc.) of students as self-managed individuals by giving the student the responsibility of learning (Demirel, 2020; Ekici, 2020). While these approaches design a student-centered learning-teaching process, they give the teacher a guiding role. According to contemporary approaches, teachers are expected to exhibit the following qualifications: dominating the classroom, focusing on content knowledge transfer, providing direct instruction, sharing authority with the student instead of traditional teaching practices, giving the student responsibility for learning, improving daily life skills and problem solving skills rather than knowledge transfer, attaching importance to practices, supporting the multi-faceted development of their students, making decisions with their students (Basu & Barton, 2010; Gutstein, 2007; Juntunen & Aksela, 2013; Moustafa et al., 2013). Considering the views of traditional educational approaches and practices and current approaches, traditional, content and teacher-centered teaching-learning approach and a contemporary learning and student-centered teaching-learning approach appear in the literature (Chan, 2003, 2004; Chan & Elliott, 2004. Cheng et al., 2009; Longworth, 2003).

Rapid changes and transformations in science and technology in the world directly affect all areas of life, as well as these effects on education processes (UNCTAD, 2018). In particular, due to the Covid 19 outbreak, different applications have been implemented in education, as in many subjects; distance education, blended learning, etc. approaches have been implemented. These developments require teachers to be lifelong learners. Teachers, who have an important role in educational services, should have a solid worldview and educational belief based on contemporary education and should be a good model for learners in the lifelong learning process (Yaman & Yazar, 2015; Karatas & Arpaci, 2021). In this context, it is very important to train prospective teachers as lifelong learners in education faculties (Köksal & Çöğmen, 2013). As a matter of fact, teachers who tend to learn lifelong

will follow the developments in education and carry their current educational practices to their classes (Cetin & Cetin, 2017).

In Turkey, The Ministry of National Education updated its primary education programs in 2005 and secondary education programs in 2012 based on a constructivist approach based on the progressive education philosophy (MoNE, 2015). These curriculums, prepared in line with the constructivist approach, also focus on the development of 21st century skills of students and their self-directed learning and lifelong learning skills within these skills. In this context, teachers are expected to continue their teaching-learning processes in line with the constructivist approach and student-centred / constructivist teaching-learning approach. It can be predicted that teachers who have lifelong learning tendencies resulting from self-directed learning will follow the changes in education and carry contemporary practices to their classes. As a matter of fact, Şentürk and Baş (2018) concluded that there are negatively significant relationships between teachers' traditional teaching-learning conception and lifelong learning, and positive and significant relationships between constructivist teaching-learning conception lifelong learning. In his research, Şahan (2020) concluded that there is a negative relationship between pre-service teachers' lifelong learning tendencies and permanent and essentialist education beliefs, and a positive relationship between progressive and reconstructive educational beliefs. In line with these findings, it can be stated that there is a relationship between lifelong learning tendencies and educational beliefs and teaching-learning conceptions. In line with this theoretical framework, this study aimed to investigate the relationship between pre-service teachers' level of self-directed learning readiness, lifelong learning tendencies and teaching-learning conceptions, and to determine the mediation role of self-directed learning in the relationship between teaching-learning conceptions and lifelong learning tendencies.

Although there are studies investigating individual's teaching-learning conceptions, lifelong learning tendency and self-directed learning readiness levels (Alexander, Kernohan & McCullagh, 2004; Salleh, Zulnaidi, Rahim, Bin Zakaria & Hidayat, 2019; Tunney & Bell, 2011), a study examining the relationship between these three variables has not been found. In this regard, the starting point of the research is determining the relationship between these three structures by examining the pre-service teachers teaching-learning conceptions, self-directed learning readiness and lifelong learning trends. In addition, based on the relevant theoretical studies, it is predicted that self-directed learning will play a mediating role in the relationship between teaching-learning conceptions and lifelong learning tendency. In this regard, this study aims to present a model by testing the mediation role of readiness for self-directed learning with SEM. It is seen as a gap in the literature that the relationship between these three variables has not been previously examined and tested with a model. In this regard, research findings are expected to contribute to the related literature. In this context, answers to the following questions were sought:

1. Is there a relationship between pre-service teachers' teaching-learning conceptions, lifelong learning tendencies and self-directed learning readiness levels?
2. Do the self-directed learning readiness levels have an intermediary role in the relationship between pre-service teachers' teaching-learning conceptions and lifelong learning tendencies?

Methodology

Sample and Procedure

There are 102 education faculties in Turkey. Every year, approximately 50,000 students enroll and graduate from these faculties. In these faculties, education lasts for 4

years, theoretical and practical (Turkey Student Selection and Placement Center, 2021). The research sample consists of pre-service teachers who are studying in different universities in Turkey. A convenient sampling design was followed to reach the data fast and easily, considering the cost effectiveness during the pandemic (Henry, 2009). Information on the research sample is presented in Table 1:

	f	**%**
Gender		
Male	198	24.8
Female	602	75.2
Grade		
1st Grade	178	22,3
2nd Grade	32	4.0
3rd Grade	214	26.7
4th Grade	376	47.0
Department		
Literature	350	43,8
Education	212	26,5
Science	23	2,9
Sports	45	5,6
Health	48	6,0
Economy	49	6,1
Child Development	5	,6
Theology	29	3,6
Engineering	18	2,3
Visual Arts	21	2,6
Total	**800**	**100**

Table 1 - Information on the Research Sample

As can be seen in Table 1, the sample consists of 800 pre-service teachers with different gender, class levels and various branches. The scales used in the research were transferred to the google form environment. A link has been generated via Google form. This link was shared online via social media, and prospective teachers were reached. In the study group, the number of women was more than the men and this situation was not planned, on the contrary it was coincidental. But women's being more than the men can also be interpreted as a reflection of that more women tends to choose a career in the teaching profession in Turkey (Korlu, 2019). In this regard, this situation was taken naturally, and it was not necessary to attempt to balance the working group in terms of gender. On the other hand, there was no favoritism in favor of any group in the distribution of the branch. The number of students from the literature and education was not something we could control. Because, volunteering was basis in participating in the research. Therefore, the distribution of these branches is a result of that the pre-service teachers' from these branches are more willing to participate in the research.

Data Collecting Tools

Teaching-Learning Conceptions Scale (TLCS): In order to determine the pre-service teachers' teaching-learning conceptions, the "Teaching-Learning Conceptions Scale" developed by Chan and Elliot (2004) and adapted to Turkish by Aypay (2011) was used. The scale consists of 30 items in total and all items are 5-point Likert type. In addition, the scale consists of two sub-dimensions. These dimensions are (a) Traditional teaching-learning conception (18 items), (b) Constructivist teaching-learning approach (12 items). Confirmatory Factor Analysis (CFA) was conducted by Aypay (2011) within the scope of the adaptation studies of the scale; according to the fit indices obtained, (x2 = 1020.3; N = 341; sd = 404; RMSEA = .067; CFI = .80) measurement model was found to be partially confirmed. However, the Cronbach alpha coefficient calculated for the whole scale was calculated as .71 for the traditional teaching-learning approach sub-dimension, and .83 for the traditional teaching-learning approach sub-dimension, and .88 for the constructivist teaching-learning approach sub-dimension. Sample items for the constructivist teaching-learning approach sub-dimension; 'Effective teaching encourages students to discuss more and participate in activities.'; 'The focus of teaching is not on the exchange of information, but on helping students to construct knowledge through their own experiences.'. Sample items for the traditional teaching-learning approach sub-dimension; 'The primary role of a teacher is to convey knowledge to students.', 'Learning means remembering what the teacher taught.'

Lifelong Learning Tendency Scale (LLTS): The scale developed by Coşkun (2009) was developed in order to learn the lifelong learning tendencies of pre-service teachers. During the scale development process, Kaiser-Meyer-Olkin value was found .89 according to the Exploratory Factor Analysis result. The 27-item scale prepared in 6-point Likert grading type consists of 4 sub-dimensions. The sub-dimensions are "motivation" (6 items), [Sample item; Although I have sufficient financial means, I continue to gain new knowledge and skills for my personal development)] "Persistence" (6 items) [Sample item; I like to spend most of my time researching to learn.],, "Lack of organizing learning" (6 items) [Sample item; I think I will have a hard time learning a knowledge or skill I have just encountered in my profession.] and "lack of curiosity" (9 items)[Sample item; I prefer to be interested in my hobbies rather than making an effort to learn new things except in compulsory situations.]. While all the items in the motivation and persistence sub-dimensions were positive; all items in the dimensions of lack of organizing learning and lack of curiosity are negative. For the whole scale, the Cronbach alpha coefficient was found as .89. This scale was preferred due to the fact that the scale was used in many studies and would be the most suitable scale to serve the purpose of this study.

Self-Directed Learning Readiness Scale (SDLRS): The scale was used in order to determine the readiness levels of pre-service teachers participating in the research for self-directed learning. The original form of the scale was developed by Fisher, King and Tague (2001) and adaptation to Turkish was carried out by Şahin & Erden (2008). The sub-dimensions of the scale are "self-management" (20 items), [Sample items; "I prefer to set my own learning goals.", "I ask for help when I encounter a problem that I cannot solve.'] "Willingness to learn" (16 items') [Sample items; "I trust my ability to research information.", "I would like to learn new information."] and "self-control" (item 16) [Sample items; "I manage my time well.", "I often review the practices I do in the classroom."] and it is stated that three factors explain 42.5% of the total variance. Cronbach's alpha internal consistency coefficients for the sub-dimensions of the scale were calculated as self-management 0.87, learning desire 0.86 and 0.79 for self-control skills (Şahin & Erden, 2008). This scale was chosen with the idea that it would be the most appropriate scale to serve the purpose of the research.

Before the data related to the research were collected, necessary permissions were obtained and the data were collected from university students who wanted to participate in the research voluntarily. At the beginning of the data collection process; the purpose of the study was explained to the students, instructions and explanations were made for filling the scales and they were asked to answer the scale items sincerely and objectively. The scientific use of the data was also emphasized in this form. Participation in the study was on voluntary basis, and the personal data was secured. An internet access address was given for students to answer the data collection tools previously transferred to the virtual environment and all students in the study group filled the scale items completely. The collected data was transferred to the computer environment to make it ready for analysis and analyses were carried out.

Results

Preliminary Analysis

Firstly, the factorability of the sub-dimensions of the measurement tools used in the research, the total variances explained, mean, standard deviation (SD), skewness, kurtosis, and reliability coefficients were examined. Findings obtained from the analysis are given in Table 2.

Scale	Subdimensions	KMO	Chi-Square	Sig.	Total Variance Explained	Mean	*SD*	Skewness (SE=.103)	Kurtosis (SE=.205)	α
TLCS	Constructivist conception	.817	778.34	.000	37.30	46.37	3.23	.-877	-.079	.62
	Traditional conception	.904	2845.94	.000	48.64	41.79	10.39	.285	-.233	.85
SDLRS	Self-direction	.865	3958.06	.000	56.76	62.06	5.67	.-548	-.389	.84
	Desire for learning	.774	2470.98	.000	62.96	50.30	5.87	.-262	.-558	.80
	Self-control skills	.854	2571.06	.000	53.32	41.59	5.51	.-473	.-352	.84
LLTS	Motivation	.795	1137.45	.000	65.69	19.37	3.28	.-508	.-317	.82
	Perseverance	.883	2368.68	.000	62.48	26.01	5.59	.-266	.-437	.88
	Lack of Self-Regulation	.797	853.13	.000	50.60	9.36	.21	.414	.-320	.75
	Lack of curiosity	.924	2611.30	.000	54.59	18.60	.28	.884	.346	.88

Table 2 - Factorability, mean, standard deviation (SD), skewness, kurtosis, and reliability coefficients

As stated in Table 2 Kaiser Meyer Olkin indices, which range from .77 to .92 indicated sampling adequacy for each subscale. Significance of the Bartlett test (p<.001) suggested that data set was appropriate for factorability. Total variance explained ranged from 37.30 to 65.69 Minimal skewness (range -.87 to .88) and kurtosis (range -.55 to .34) confirmed the normality distribution. Finally, Cronbach's α coefficients, which ranged from .62 to .88 confirmed the reliability of scales (Nunnally & Bernstein, 1994; Ozdamar, 2018). Some researchers also argue that Cronbach Alpha coefficient eqeuals to .60 and above is acceptable in the social sciences (Clark & Watson, 1995; Loewenthal, 2004). After these

findings, correlation coefficients between Teaching-Learning Conceptions, Self-Directed Learning Readiness and Lifelong Learning Tendency subscales were calculated and presented in Table 3.

Scale	Sub-dimensions	1.a.	2.a.	1.b.	2.b.	3.b.	1.c.	2.c.	3.c.	4.c.
TLCS	1.a. Constructivist conception	1								
	2.a. Traditional conception	.-11**	1							
SDLRS	1.b. Self-direction	.40**	.05**	1						
	2.b. Desire for learning	.34**	.13**	.57**	1					
	3.b. Self-control skills	.24**	.19**	.65**	.60**	1				
LLTS	1.c. Motivation	.26**	.-01**	.57**	.46**	.42**	1			
	2.c. Perseverance	.20**	.08**	.54**	.44**	.46**	.73**	1		
	3.c. Lack of Self-Regulation	.-25**	.33**	.-30**	.-16**	.-18**	.-24**	.-18**	1	
	4.c. Lack of curiosity	.-17**	.28**	.-36**	.-18**	.-24**	.-37**	.-34**	.58**	1

**p<.001

Table 3 - Teaching-Learning Conceptions, Self-Directed Learning Readiness, and Lifelong Learning Tendency sub-dimensions correlation coefficients

When Table 3 is examined, it is seen that there is a positive and significant relationship between *Constructivist teaching-learning conception* from Teaching-Learning Conceptions sub-dimension, Motivation (r = .44, p <.001) and *Perseverance* (r = -. 20, p <.001) from Lifelong Learning Tendency subscales and that there is a negative and significant relationship between lack of self-regulation (r = -.- 25, p <.001) and lack of curiosity (r = -.- 17, p <.001). Similarly, it is seen that there is a positive and significant relationship between *constructivist teaching-learning conception* and *self-direction* (r= .40, p<.001), *desire for learning* (r=-.34, p<.001), *self-control skills* (r=-.24, p<.001) from Self-Directed Learning Readiness Scale sub-dimension. There is a negative and significant relationship between *traditional teaching-learning conception from* Teaching-Learning Conceptions sub-dimension and *motivation* (r.-01, p<.001) from Lifelong Learning Tendency sub-dimension; there is a positive and significant relationship between *perseverance* (r=-.08, p<.001), *lack of self- regulation*(r=-.33, p<.001) and *lack of curiosity* (r=-.28, p<.001). Similarly, it is seen that there is a very low level of positive and significant relationship between *traditional teaching-learning conception* and Self-Directed Learning Readiness Scale sub-dimensions: *self-direction* (r= .05, p<.001), *desire for learning* (r=-.13, p<.001), *self-control skills* (r=19, p<.001).

Measurement and Structural Models

Before proceeding to the mediation analysis, measurement models, whether the scales used and the factor structures of the scales were verified, were tested. In addition, the values related to the structural model in which the role of readiness for self-directed learning is examined in the relationship between constructivist teaching-learning approach and traditional teaching-learning approach and lifelong learning tendencies. These good fit coefficients are given in Table 4:

Fit Indices	Measurement Models				Structural Model	Reference Value(s)[1]
	TLCS		SDLRS	LLTS		
	Traditional	Constructivist				
χ^2	365.51	75.60	2392.82	603.48	1389.42	
p value	< .01	< .01	< .01	< .01	< .01	
χ^2/df	3.69	2.16	4.70	2.76	2.87	≤ .5
GFI	.94	.98	.83	.94	.90	≥ .90
AGFI	92	.97	.80	.92	.88	≥ .80
CFI	.91	.95	.83	.95	.87	≥ .90
IFI	.91	.95	.83	.95	.87	≥ .90
RMSEA	.05	.03	.06	.04	.04	≤ .08
SRMR	.05	.03	.07	.04	.04	≤ .08

[1] (Hair et al., 2017; Hu & Bentler, 1999; Ilhan & Çetin, 2014; Segars & Grover, 1993; Yilmaz & Çelik, 2009).

Table 4 - Model Fit Indices

As presented in Table 4, it is seen that the measurement models and the coefficients of fit obtained from the structural model have acceptable and strong fit values p <.01 significance level. In other words, it can be said that the construct validity of the scales and therefore the validity of the structural model is ensured. Segars and Grover (1993) accept that the AGFI value is .80 and above Hoe (2008) RMSEA value is below 0.08 as an acceptable fit value. On the other hand, it is seen that some fit values do not comply with the specified reference values. For example, while [χ2 / df] value among measurement models is between the "good fit" value in other measurement models, it is among the acceptable fit references in the SDLR measurement model (Karagoz, 2016). This is because the sample size is relatively large and the degree of freedom is low in models with more parameters, so the value of χ2 / df can be relatively high (Yilmaz & Çelik, 2009). Likewise, it is seen that the CFI value is below the acceptable fit value in the SDLR measurement model and the structural model. But it has values very close to acceptable fit value. Kenny (2012) states that the CFI value may be too high "when the correlations between the variables are generally high". In this context, it can be interpreted that the relationship between the sub-dimensions in the SDLR measurement model and the variables in the structural model is not in a very high level. Field experts suggest that the fit index values of the measurement model or the structural model should be evaluated in a holistic manner (Ilhan & Cetin, 2014). Therefore, according to the findings, it can be said that the measurement models and the structural model revealed are confirmed, since it is seen that many fit values have values above the strong and acceptable fit values. The path diagram of the structural model is given in Figure 2.

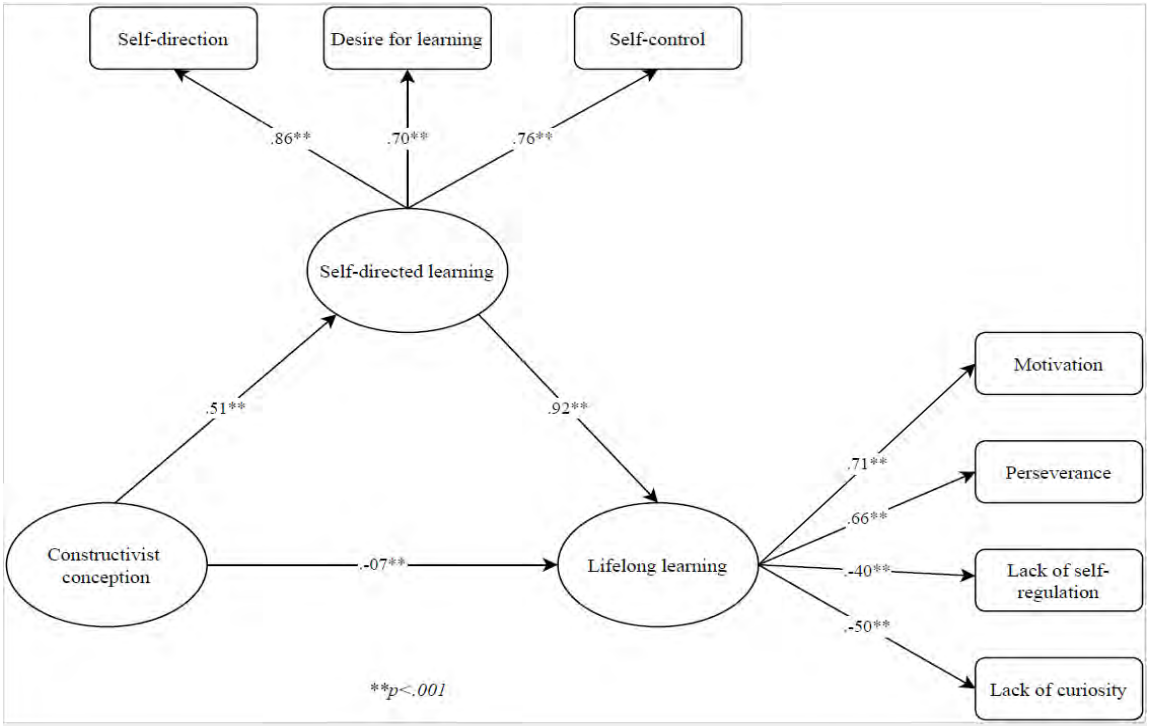

Figure 2. The Structural Model

Mediation Analysis

After the measurement model and the structural model were verified, the 4-step analysis proposed by Baron and Kenny (1986) was carried out for both the constructivist teaching-learning conception and the traditional teaching-learning conception. Mediation analysis was carried out first in traditional teaching-learning conception. However, because prerequisites could not be provided, brokerage analysis could not be performed. Based on this finding, there is a positive but statistically insignificant relationship between traditional teaching-learning approach and lifelong learning disposition. Then the results shown in Table 3 suggested that Constructivist teaching-learning conception significantly predicts lifelong learning tendency (β =.46, t=5.91, p<.001). In the second step, Constructivist teaching-learning conception significantly predicted Self-Directed Learning Readiness (β =.49, t=7.45, p<.001). In the third step, Self-Directed Learning Readiness significantly predicted lifelong learning tendency (β =-.80, t=17.93, p<.001). In the fourth step, both Constructivist teaching-learning conception (β =.-046 t=.-931, p= .352) and Self-Directed Learning Readiness (β =.835t=15.51, p<.01). When both variables are included in the model, the effect of the constructivist teaching-learning approach on Lifelong Learning Tendency has become meaningless, and Self-Directed Learning Readiness has increased effect.

Step	Path			Std. β	β	S.E.	C.R.	p
1	Constructivist conception	→	Lifelong Learning	6.64	.458	1.12	5.91	***
2	Constructivist conception	→	Self-Directed Learning	15.40	.490	2.06	7.45	***
3	Self-Directed Learning	→	Lifelong Learning	.433	.801	.024	17.93	***
4	Constructivist conception	→	Lifelong Learning	-.810	-.046	.870	-.931	.352
	Self-Directed Learning	→	Lifelong Learning	.439	.835	.028	15.51	***

Table 5 - Mediation Analysis Results

After four-stage brokerage analysis, bootstrapping was performed to evaluate the significance of direct and indirect effects in the full mediation model. While performing the bootstrapping process, 5000 resampling methods were chosen. In addition, 95% confidence intervals were determined. The results of the bootstrapping process are presented in Table 6.

Model paths				Boostrap Values		BIAS %95 GA	
				Coefficient	Se	Lower limit	Upper Limit
Direct Effect							
Constructivist conception	→	Lifelong Learning		.-04	.05	.-14	.05
Constructivist conception	→	Self-Directed Learning		.50	.04	42	.58
Self-Directed Learning	→	Lifelong Learning		.84	.05	.74	.92
Indirect Effect							
Constructivist conception	→	Self-Directed Learning	→ Lifelong Learning	.42	.04	.33	.51

Table 6 - Results of the Bootstrapping Process

When the bootstrapping coefficients (bootstrap coefficient = .42; Se = .04) and the confidence intervals of these coefficients (95GA = .33, .51) presented in Table X are analysed, it is understood that the direct paths are meaningful. Therefore, it is seen that readiness for self-directed learning has a full mediating role in the relationship between constructivist teaching-learning approach and lifelong learning tendencies.

Discussion and Conclusion

According to the findings obtained in the research in general terms, it was found that there was a significant positive relationship between the constructivist teaching-learning approach and the lifelong learning tendencies, which were among the teaching-learning conceptions, and that self-directed learning readiness was a mediator role in this relationship. On the other hand, it was seen that there was no significant relationship between traditional teaching-learning conception and lifelong learning.

One of the findings obtained from the research shows that there is a positive significant relationship between the constructivist teaching-learning conceptions and the lifelong learning tendencies among the teacher-learning conceptions sub-dimensions. This

finding shows that pre-service teachers in constructivist teaching-learning conception tend to lifelong learning. In this regard, it can be stated that pre-service teachers who have a constructivist teaching-learning approach think that learning has a lifelong structure (Graves, 2018) without any time or place limit. In addition, it can be stated that individuals with a constructivist teaching-learning conception will tend to learn throughout life as they try to "learn to learn" (Scrivener, 2005). In other words, according to this finding, pre-service teachers who have a constructivist teaching-learning conception, especially in the 21st century, have an understanding that knowledge is not static but constantly changes (Hirschmana & Wood, 2018) and that learning continues after the formal school process and continues for life (Rogers, 2014). Şentürk & Baş (2018) investigated the relationship between teachers' teaching-learning conception and effective lifelong learning in a study they conducted. According to the research findings, a positive relationship has emerged between teachers' constructivist teaching-learning conceptions and effective lifelong learning. This result, which emerged in the research conducted with teachers, is similar to this research conducted with pre-service teachers. Sinatra and Kardash (2004) stated that students who believe that knowledge is structured and change over time in a study with prospective university students, are more inclined to believe that learning involves thinking deeply about new ideas and establishing a personal and emotional relationship with new information. According to these findings obtained from this research and other studies, it can be stated that individuals with a constructivist teaching-learning approach will have a higher level of lifelong learning tendency.

In another finding obtained in the research it has been observed that there is a positive significant relationship between pre-service teachers' constructivist teaching-learning conception and self-directed learning readiness among sub-dimensions of teaching-learning conceptions. According to this finding, it can be argued that pre-service teachers who have a constructivist teaching-learning conception (Gardner, 2011), which defends the view that learning should be continued for a lifetime because the concepts acquired in a divided life cannot carry one into the future, will realize self-directed learning (Long, 2005) with goal setting, cognitive processing, managing learning and decision making skills. In this context, Sze-yeng and Hussain (2010) obtained the conclusion that support these research findings: socio-constructivist learning environments improve students' self-directed learning skills in a study they conducted with their master students. Accordingly, it can be argued that pre-service teachers should receive education in constructivist learning environments in order to create a constructivist teaching learning conception. It can be stated that pre-service teachers who grow up in constructivist learning environments will develop their constructivist teaching-learning conception (Richardson, 1997) and this will contribute to self-directed learning skills. As a matter of fact, Kek and Huijser (2011) states in a study that students have higher levels of self-directed learning if they enable students to question, explain, justify and evaluate their ideas in a classroom environment, that is, they display a constructivist approach.

Another finding obtained in the research is that readiness for self-directed learning is a full mediator role in a meaningful positive relationship between constructivist teaching-learning conception and lifelong learning tendencies. Accordingly, it can be said that pre-service teachers who have a constructivist teaching-learning conception and are ready for self-directed learning will tend to have a higher level of lifelong learning. Sarıtepeci and Orak (2019) revealed the finding that self-directed learning predicted lifelong learning trends in their research with pre-service teachers. In their study, Yılmaz and Karaoğlan-Yılmaz (2019) found a meaningful relationship between pre-service teachers' lifelong learning tendencies and self-directed learning readiness, which can be counted positively at a high level. Other studies have shown that self-directed learning supports lifelong learning (Boyer et al., 2013;

Tunney & Bell, 2011). In this context, it can be predicted that teachers who are pro-change and open to innovations and have a constructivist teaching-learning approach that applies contemporary pedagogy in the professional field (Mynbayeva, et al., 2018) will continue their lifelong learning activities (European Commission, 2019) in order to develop their knowledge, skills and competencies and will tend to lifelong learning by organizing their own learning with their readiness to self-directed learning and determining their own goals (Grover, 2015).

According to another finding of the research, it has been concluded that readiness for self-directed learning has a full mediating role in the relationship between constructivist teaching-learning conception and lifelong learning trends. According to the results of the research, it is seen that readiness for self-directed learning increases lifelong learning tendencies. This result confirms the view that self-directed learning is closely related to lifelong learning (Cremers et al., 2014). Considering that individuals with constructivist conception take responsibility for learning and learn by constructing knowledge, it can be stated that they will have self-directed learning by developing a series of learning strategies and in this case, they will naturally tend to learn lifelong.

Recommendations for Educational Policy

The changes and transformations in the world, of course, also affect the education systems and as a result, the aims and content of education; besides the teaching process, it creates the need for teachers to reconsider the role of the school as a learning organization (Council of Europe, 2015). The European Commission has decided to adapt education and training systems to the new realities of the 21st century and develop basic policies for the development of citizenship, social cohesion and employment for lifelong learning (European Commission, 2019). In addition, learning and teaching approaches change in the 21st century, new approaches to learning and teaching and new pedagogical practices emerge (Hirschmana & Wood, 2018). In this respect, it is very important for teachers and pre-service teachers to have self-directed learning skills and lifelong learning tendency in order to follow and apply contemporary teaching-learning conceptions.

In the study, a significant positive relationship was found between the constructivist teaching-learning conception, one of the teaching-learning conceptions, and lifelong learning tendencies, and it was concluded that readiness for self-directed learning had a full mediating role in this relationship. Individuals who adopt the constructivist approach do not settle for what they have learned at school professionally and constantly strive to renew and improve themselves (Danielson, 2011). Therefore, pre-service teachers with a constructivist conception will tend to continue their lifelong learning, knowing that they cannot continue their professional life with what they have learned at school after graduation (Day, 2002; Putnam & Borko, 2000). In addition, it is observed that individuals who are grown up in constructivist educational environments have increased their readiness for self-directed learning and tend to be lifelong learning (Şentürk & Baş, 2018; Kek & Huijser, 2011). In this sense, it is important that pre-service teachers studying in education faculties are trained in constructivist educational environments with a constructivist conception. Kardaş (2014) determined that 84.8% of the pre-service teachers did not have sufficient awareness, knowledge and experience about the “constructivist teaching approach”, while 15.2% of the participants had enough knowledge about constructivism. In this direction, it is important to train prospective teachers in accordance with the constructivist teaching-learning approach and to develop lifelong learning skills in Turkey, where constructivist teaching-learning process has been carried out since 2005. In the study, a positive significant relationship was

found between constructivist teaching-learning conception and lifelong learning tendencies, so it can be stated that pre-service teachers who were trained in line with the constructivist teaching-learning approach will also have lifelong learning tendencies.

Necessary studies should be carried out in order to ensure that teachers as well as pre-service teachers adopt a constructivist approach and become lifelong learners. In this context, teachers were provided to examine new approaches, sample practices in an innovative platform established by Ministry of National Education in Turkey: an educational information network (EBA) digital learning-teaching platform. Specialists on the platform share posts and seminars with distance education are also conducted. In addition, the platform was opened to pre-service teachers studying at the faculties of education and academics working at the faculties of education and teachers, pre-service teachers and academics are also provided to follow the innovations and to share up-to-date (Ministry of National Education [MoNE], 2019). With this application, educators were given the opportunity to follow the innovations and changes related to education and provided lifelong learning with self-directed learning and they are aimed to adopt contemporary teaching-learning approaches. These applications, which have many examples in the world, can be extended nationally or internationally at the higher education level.

Due to the COVID-19 coronavirus epidemic that affects the whole world, it has been understood how important it is to follow modern approaches and practices in education nowadays, where face-to-face training cannot be carried out (Akat & Karataş, 2020; UNESCO, 2020). In such cases, it will be possible to achieve synchronous or asynchronous digital education applications such as distance education, e-learning, m-learning, web 2.0 tools, webinars with teachers who have a constructivist teaching-learning conception and follow the contemporary literature and practices in education by performing lifelong learning with self-directed learning skills. In addition, due to the COVID-19 coronavirus epidemic, the conduct of education through distance education and the digitalization of teaching-learning processes have revealed the importance of individuals to have self-directed learning skills. For this reason, it is one of the most important elements of today that students have self-directed skills and a lifelong learning tendency in this direction.

Finally, in this study, the quantitative research method was employed when examining the relationships between pre-service teachers' teaching-learning conceptions, self-directed learning readiness, and lifelong learning trends and It is important to carry out a qualitative and / or mixed method research to provide a deeper understanding of the phenomena discussed in the study. Because this research offers a relatively limited understanding of the phenomena discussed, and it is considered that it may be meaningful to carry out various studies in the future with the research approaches expressed so that the truth can be addressed from a broader perspective.

Limitations of the Research

The number of people whose research data was collected and obtaining the data cross-sectionally can be seen as an obstacle in the generalization of the findings. In particular, the lack of physical mobility due to the pandemic made it impossible to collect data from different geographical regions of Turkey. Therefore, it was preferred to collect data with an online questionnaire through appropriate sampling. Accordingly, it can be suggested that similar studies by choosing methods such as stratified and cluster sampling, which allow the diversity in the universe to be reflected in more detail, be carried out on a larger scale in the national or international arena. In addition, the study can be carried out not only with pre-service teachers, but also with teachers on the job. Comparison can be made by examining

the teaching-learning conceptions, lifelong learning tendencies, and self-directed learning levels of pre-service teachers who are prepared for the task with a national or international study. Also, the SEM approach does not allow the determination of causal relationships. For this reason, the reasons why pre-service teachers who have a constructivist learning conception have tendency to self-directed learning and lifelong learning can be examined in depth using qualitative research techniques.

References

Akat, M., & Karataş, K. (2020). Psychological effects of COVID-19 Pandemic on society and its reflections on education. *Electronic Turkish Studies*, *15*(4), 1-13.

Alexander S., Kernohan G., & McCullagh P. (2004). Self-directed and lifelong learning. *Studies in Health Technology and Informatics, 109,* 152-166.

Allen, L., & Kelly, B. B. (2015). *Transforming the workforce for children birth through age 8: A unifying foundation.* Washington, DC: The National Academies Press.

Ates, H., & Alsal, K. (2012). The importance of lifelong learning has been increasing. *Procedia - Social and Behavioral Sciences, 46*(2012), 4092-4096. https://doi.org/10.1016/j.sbspro.2012.06.205

Avis, J., Fisher, R., & Thompson, R. (2019). *Teaching in lifelong learning: A guide to theory and practice* (3rd edition). New York, NY: Open International Publishing.

Aypay, A. (2011). The adaptation of the teaching-learning conceptions questionnaire and its relationships with epistemological beliefs. *Educational Sciences: Theory & Practice*, *11*(1), 7-29.

Baş, G., & Şentürk, C. (2019). Teaching-learning conceptions and curriculum fidelity: A relational research. *International Journal of Curriculum and Instruction 11*(2), 163-180.

Basu, S. J., & Barton, A. C. (2010). A researcher-student-teacher model for democratic science pedagogy: connections to community, shared authority, and critical science agency. *Equity & Excellence in Education, 43*(1), 72-87. https://doi.org/10.1080/10665680903489379

Biesta, G. J. J. (2016). *Good education in an age of measurement: Ethics, politics, democracy.* New York, NY: Routledge.

Black, P., Mccormick, R., James, M. & Pedder, D. (2006) Assessment for learning and learning how to learn: A theoretical enquiry. *Research Papers in Education, 21*(2), 119-132. https://doi.org/10.1080/02671520600615612

Boholano, H. B. (2017). Smart social networking: 21st century teaching and learning skills. *Research in Pedagogy, 7*(1), 21-29. https://doi.org/10.17810/2015.45

Bolhuis, S. (1996, April). *Towards active and self-directed learning: Preparing for lifelong learning, with reference to Dutch secondary education.* Paper presented at the Annual Meeting of the American Educational Research Association, New York.

Bolhuis, S. (2003). Towards process-oriented teaching for self-directed lifelong learning: A multidimensional perspective. *Learning and Instruction, 13*(3), 327-347. https://doi.org/10.1016/S0959-4752(02)00008-7

Boyer, S. L., Edmondson, D. R., Artis, A. B., & Fleming, D. (2013). Self-directed learning: A tool for lifelong learning. *Journal of Marketing Education*, *36*(1), 20-32. https://doi.org/10.1177/0273475313494010

Braun, A., März, A., Mertens, F., & Nisser, A. (2020). *Rethinking education in the digital age.* Brussels: European Union Publishing.

Brockett, R. G., & Hiemstra, R. (1991). *Self-direction in adult learning: Perspectives on theory, research, and practice.* London: Routledge.

Brookfield, S. D. (2009). Self-directed learning. In R. Maclean & D. Wilson (eds) *International handbook of education for the changing world of work* (pp. 2615-2627). Springer. https://doi.org/10.1007/978-1-4020-5281-1_172

Brooks, M. G., & Brooks, J. G. (1999). *In search of understanding: The case for constructivist classrooms* (2nd ed.). Alexandria, Virginia: Association for Supervision and Curriculum Development.

Candy, P. C. (1990). The transition from learner-control to autodidaxy: More than meets the eye. In H. B. Long (Ed.), *Advances in research and practice in self-directed learning* (pp. 9-46). Norman, Oklahoma: Research Center for Continuing Professional and Higher Education of the University of Oklahoma.

Cetin, S., & Cetin, F. (2017). Lifelong learning tendencies of prospective teachers. *Journal of Education and Practice, 8*(12), 1-8.

Chan, K. W. (2003). Hong Kong teacher education students' epistemological beliefs and approaches to learning. *Research in Education, 69,* 36-50. https://doi.org/10.7227/RIE.69.4

Chan, K. W. (2004). Preservice teachers' epistemological beliefs and conceptions about teaching and learning: Cultural implications for research in teacher education. *Australian Journal of Teacher Education, 29*(1), 1-13. https://doi.org/10.14221/ajte.2004v29n1.1

Chan, K-W., & Elliott, R. G. (2004). Relational analysis of personal epistemology and conceptions about teaching and learning. *Teaching and Teacher Education, 20*(8), 817-831. https://doi.org/10.1016/j.tate.2004.09.002

Cheng M. M. H., Chan K-W., Tang S. Y. F., & Cheng A. Y. N. (2009). Pre-service teacher education students' epistemological beliefs and their conceptions of teaching. *Teaching and Teacher Education, 25*(2009) 319-327. https://doi.org/10.1016/j.tate.2008.09.018

Chuprina, L. (2003, October). *Development of self-directed learning skills in students enrolled in ESL/adult education classes.* Proceedings Midwest Research to Practice Conference in Adult Continuing and Community Education. The Ohio State University, Columbus, Ohio.

Clark, L. A., & Watson, D. (1995). Constructing validity: Basic issues in objective scale development. *Psychological Assessment, 7,* 309-319. https://doi.org/10.1037/1040-3590.7.3.309

Coolahan, J. (2002). Teacher education and the teaching career in an era of lifelong learning. *OECD Education Working Papers, 2,* OECD Publishing.

Coşkun, Y. (2009). *Investigation of lifelong learning tendency of undergraduate students in terms of some variables* [Unpublished Doctoral Dissertion], Hacettepe University.

Council of Europe (2015). Education for change, change for education. Teacher manifesto for the 21st century of the conference. *The Professional Image and Ethos of Teachers,* April 2014, Council of Europe, Strasbourg.

Cremers, P. H. M., Wals, A. E. J., Wesselink, R., Nieveen, N., & Mulder, M. (2014). Self-directed lifelong learning in hybrid learning configurations. *International Journal of Lifelong Education, 33*(2), 207-232. https://doi.org/10.1080/02601370.2013.838704

Deakin-Crick, R. (2005). Learner-centred teachers. In T. Alexander & J. Potter (Eds.), *Education for change: Transforming the way we teach our children* (pp. 159-165). Routledge.

Demirel, M. (2009). Lifelong learning and schools in the twenty-first century. *Procedia Social and Behavioral Sciences 1*(2009), 1709-1716. https://doi.org/10.1016/j.sbspro.2009.01.303

Demirel, Ö. (ed.). (2020). *Eğitimde yeni yönelimler* [New directions in education]. Ankara: Pegem Academy Publishing. https://doi.org/10.14527/9786257052481
Derrick, M. G. (2003). Creating environments conducive for lifelong learning. *New Directions for Adult and Continuing Education, 2003*(100), 5-18. https://doi.org/10.1002/ace.115
Dewey, J. (1916). *Democracy and education.* New York: Macmillan Publishing.
Dhaliwal, M. K. (2015). Teachers becoming lifelong learners. *The Business & Management Review, 5*(4), 259-264.
Driscoll, M. P. (2004). *Psychology of Learning for Instruction* (3rd ed.). New York, NY: Pearson.
Ekici, G. (ed.). (2020). *Yeni öğrenme-öğretme yaklaşımları ve uygulama örnekleri* [New learning-teaching approaches and practice examples]. Pegem Academy Publishing.
European Commission. (2019). *Key competences for lifelong learning.* Luxembourg: Publications Office of the European Union.
Fischer, G. (2001). Lifelong learning and its support with new media: cultural concerns. In: N. J. Smelser, P. B. Baltes (eds.). *International encyclopedia of the social & behavioral sciences* (pp. 8836-8840). Elsevier. https://doi.org/10.1016/B0-08-043076-7/04675-1
Fischer, G., & Sugimoto, M. (2006). Supporting self-directed learners and learning communities with sociotechnical environments. *Research and Practice in Technology Enhanced Learning 1*(1), 31-64. https://doi.org/10.1142/S1793206806000020
Gardner, H. (2011). *The unschooled mind: How children think and how schools should teach* (20th anniversary ed.). New York: Basic Books.
Garrison, D. R. (1997). Self-directed learning: Toward a comprehensive model. *Adult Education Quarterly, 48*(1), 18-33. https://doi.org/10.1177/074171369704800103
Gencel, İ. E. (2013). Prospective teachers' perceptions towards lifelong learning competencies. *Education and Science*, *38*(170), 237-252.
Graves, M. R. (2018). Lifelong learning: Applying cognitive load theory to elder learners suffering from age-related cognitive decline. *Simon Fraser University Educational Review, 11*(1), 91-97. https://doi.org/10.21810/sfuer.v11i1.755
Grover, K. (2015). Online social networks and the self-directed learning experience during a health crisis. *International Journal of Self-Directed Learning, 12*(1), 1-15.
Gutstein, E. (2007). "An that's just how it starts": Teaching mathematics and developing student agency. *Teachers College Record, 100*(2), 420-448. https://doi.org/10.1108/IMDS-04-2016-0130
Hair, J., Hollingsworth, C. L., Randolph, A. B., & Chong, A. Y. L. (2017). An updated and expanded assessment of PLS-SEM in information systems research. *Industrial Management & Data Systems*, *117*(3), 442-458.
Henry, G. (2009). Practical sampling. In L. Bickman & D. Rog (Eds.), *The sage handbook of applied social research methods* (pp. 77-105). Sage. https://doi.org/10.4135/9781483348858.n3
Hiemstra, R. (1994). Self-directed learning. In T. Husen & T. N. Postlethwaite (Eds.), *The international encyclopedia of education* (2nd ed.). Oxford: Pergamon Press.
Hirschmana, K., & Wood, B. E. (2018). 21st century learners: Changing conceptions of knowledge, learning and the child. *New Zealand Annual Review of Education, 23,* 20-35. https://doi.org/10.26686/nzaroe.v23i0.5280
Hoe, S.L. (2008). Issues and procedures in adopting structural equation modeling technique. *Journal of Applied Quantitative Methods, 3*(1), 76-83.
Hu, L., & Bentler, P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6*(1), 1-55. https://doi.org/10.1080/10705519909540118

Ilhan, M., & Cetin, B. (2014). Comparing the analysis results of the structural equation models (SEM) conducted using LISREL and AMOS. *Journal of Measurement and Evaluation In Education And Psychology-Epod*, *5*(2), 26-42. https://doi.org/10.21031/epod.31126

James, D. L. (2008). *Self-directed learning for early childhood educators: Research in action* [Unpublished doctoral dissertations]. Proquest Dissertations and Thesis database (UMI: 3305572).

Javed, M. S., Athar, M. R., & Saboor, A. (2019). Development of a twenty-first century skills scale for agri varsities. *Cogent Business & Management (2019), 6,* 1-23. https://doi.org/10.1080/23311975.2019.1692485

Juntunen, M., & Aksela, M. (2013). Life-cycle analysis and inquiry-based learning in chemistry teaching. *Science Education International, 24*(2), 150-166.

Karagoz, Y. (2016). *SPSS 23 and AMOS 23 applied statistical analysis.* Nobel Publishing.

Kardaş, M. N. (2014). Awareness and competencies of the Turkish teacher candidates about constructive teaching approach. *The Journal of International Social Research, 7*(34), 779-791.

Karatas, K. (2017). Predicting teacher candidates' self-directed learning in readiness levels for terms of metacognitive awareness levels. *Hacettepe University Journal of Education*, *32*(2), 451-465.

Karatas, K., & Arpaci, I. (2021). The role of self-directed learning, metacognition, and 21st century skills predicting the readiness for online learning. *Contemporary Educational Technology*, *13*(3), ep300. https://doi.org/10.30935/cedtech/10786

Karatas, K., & Zeybek, G. (2020). The role of the academic field in the relationship between self-directed learning and 21st century skills. *Bulletin of Education and Research*, *42*(2), 33-52.

Kek, M., & Huijser, H. (2011). Exploring the combined relationships of student and teacher factors on learning approaches and self-directed learning readiness at a Malaysian university. *Studies in Higher Education, 36*(2), 185-208. https://doi.org/10.1080/03075070903519210

Kenny, D. A. (2012). Measuring model fit. http://davidakenny.net/cm/fit.htm

Khalid, A., and Azeem, M. (2012). Constructivist vs traditional: effective instructional approach in teacher education. *International Journal of Humanities and Social Science, 2*(5), 170-177.

Kim, J. S. (2005). The effects of a constructivist teaching approach on student academic achievement, self-concept, and learning strategies. *Asia Pacific Education Review, 6*(1), 7-19. https://doi.org/10.1007/BF03024963

Knowles, M. (1975). *Self-directed learning: A guide for learners and teachers.* New York: Associated Press.

Köksal, N., & Çöğmen, S. (2013). Pre-service teachers as lifelong learners: University facilities for promoting their professional development. *Eurasian Journal of Educational Research, 53,* 21-40. n https://doi.org/10.14689/ejer.2013.53.2

Korlu, O. (2019). *Education at a glance the state of Education in Turkey by 2019.* ERG Report. https://www.egitimreformugirisimi.org/wp-content/uploads/2010/01/Bir-Bak%C4%B1%C5%9Fta-E%C4%9Fitim-2019%E2%80%99a-G%C3%B6re-T%C3%BCrkiye%E2%80%99de-E%C4%9Fitimin-Durumu.pdf

Longworth, N. (2003). *Lifelong learning in action: Transforming education in the 21st century*. Routledge. https://doi.org/10.4324/9780203465684

Loewenthal, K. M. (2004). *An introduction to psychological tests and scales* (2 ed.). Psychology Press.

Miller, J., Kostogriz, A., & Gearon, M. (Eds.). (2009). *Culturally and linguistically diverse classrooms: New dilemmas for teachers.* Bristol, UK: Multilingual Matters.

MoNE [Ministry of National Education]. (2015). *Turkish education system and secondary education.* Ankara: Ministry of National Education Publication.

MoNE [Ministry of National Education]. (2019). *Educational vision of 2023.* Ankara: Ministry of National Education Publication.

Moustafa, A., Ben-Zvi-Assaraf, O., & Eshach, H. (2013). Do junior high school students perceive their learning environment as constructivist? *Journal of Science Education and Technology, 22*(4), 418-431. https://doi.org/10.1007/s10956-012-9403-y

Mynbayeva, A., Sadvakassova, Z., & Akshalova, B. (2018). Pedagogy of the Twenty-First Century: Innovative Teaching Methods. In O. Bernad-Cavero (Ed.), *New pedagogical challenges in the 21st century* (pp. 3-20). London: IntechOpen Limited. https://doi.org/10.5772/intechopen.72341

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory*. *McGraw-Hill.*

OECD [Organisation for Economic Co-operation and Development]. (2016). *Education at a glance, 2016.* OECD publishing.

OECD [Organisation for Economic Co-operation and Development]. (2018). *The future of education and skills: Education 2030.* OECD publishing.

OECD [Organisation for Economic Co-operation and Development]. (2012). *Equity and quality in education: Supporting disadvantaged students and schools.* OECD Publishing.

Ouane, A. (2008, October). *What stakes for the world forum on lifelong learning?* Proceedings of the First World Forum on Lifelong Learning, UNESCO, Paris.

Ozdamar, K. (2018). *Paket programlar ile istatistiksel veri analizi.* Kaan Bookstore.

Parisi, G. I., Kemker, R., Part, J. L., Kanan, C., & Wermter, S. (2019). Continual lifelong learning with neural networks: A review. *Neural Networks, 113,* 54-71. https://doi.org/10.1016/j.neunet.2019.01.012

Piaget, J. (1976). *To understand is to invent: The future of the education.* Penguin Books.

Prawat, R. S. (1992). Teachers' beliefs about teaching and learning: A constructivist perspective. *American Journal of Education, 100*(3), 354-395. https://doi.org/10.1086/444021

Reigeluth, C. M. (2012). Instructional theory and technology for the new paradigm of education. *Revista de Educación a Distancia, XI*(32), 1-18.

Reischauer, G. (2018). Industry 4.0 as policy-driven discourse to institutionalize innovation systems in manufacturing. *Technological Forecasting and Social Change, 132,* 26-33. https://doi.org/10.1016/j.techfore.2018.02.012

Richardson, V. (1997). Constructivist teaching and teacher education: Theory and practice. In V. Richardson (Ed.), *Constructivist teacher education* (pp. 13-24). Routledge.

Rogers, A. (2014). The classroom and the everyday: The importance of informal learning for formal learning. *Investigar em Educação, 1,* 7-34.

Roztocki, N., Soja, P., & Weistroffer, H. R. (2019). The role of information and communication technologies in socioeconomic development: towards a multi-dimensional framework. *Information Technology for Development, 25*(2), 171-183. https://doi.org/10.1080/02681102.2019.1596654

Şahan, H. H. (2020). The relationship of prospective teachers' educational philosophy and life-long learning tendencies to their teaching-learning process competencies. *Pegem Journal of Education and Instruction, 10*(4), 1325-1367. https://doi.org/10.14527/pegegog.2020.040

Şahin, E., & Erden, M. (2009). Reliability and validity of self-directed learning readiness scale (SDLRS). *E-Journal of New World Sciences Academy*, *4*(3), 695-706.

Sahu P. (2020). Closure of universities due to coronavirus disease 2019 (Covid-19): Impact on education and mental health of students and academic staff. *Cureus 12*(4), e7541. https://doi.org/10.7759/cureus.7541

Salleh, U. K. M., Zulnaidi, H., Rahim, S. S. A., Bin Zakaria, A. R., & Hidayat, R. (2019). Roles of self-directed learning and social networking sites in lifelong learning. *International Journal of Instruction*, *12*(4), 167-182. https://doi.org/10.29333/iji.2019.12411a

Samuelowicz, K., & Bain, J. D. (2001). Revisiting academics' beliefs about teaching and learning. *Higher Education, 41,* 299-325. https://doi.org/10.1023/A:1004130031247

Sarıtepeci, M., & Orak, C. (2019). Lifelong learning tendencies of prospective teachers: Investigation of self-directed learning, thinking styles, ICT usage status and demographic variables as predictors. *Bartın University Journal of Faculty of Education, 8*(3), 904-927.

Schunk, D. H. (2012). *Learning theories: An educational perspective* (6th ed.). Pearson Education.

Scott, C. L. (2015). *The futures of learning 1: Why must learning content and methods change in the 21st century?* ERF Working Papers Series, 13. Paris: UNESCO Education Research and Foresight.

Scrivener, J. (2005) *Learning teaching* (2nd ed.). Oxford.

Segars, A. H., & Grover, V. (1993). Re-examining perceived ease of use and usefulness: A confirmatory factor analysis. *MIS Quarterly, 17*(4), 517-525. https://doi.org/10.2307/249590

Şentürk, C., & Baş, G. (2018, April). *Teaching-learning conceptions and effective lifelong learning in teachers: the mediating role of change tendencies.* Proceedings 27th International Conference on Educational Sciences, Antalya.

Sinatra, G. M., & Kardash, C. A. M. (2004). Teacher candidates' epistemological beliefs, dispositions, and views on teaching as persuasion. *Contemporary Educational Psychology, 29,* 483-498. https://doi.org/10.1016/j.cedpsych.2004.03.001

Tomlinson, C. A. (2014). *The differentiated classroom: Responding to the needs of all learners* (2nd edition). Association for Supervision and Curriculum Development Publications.

Towle, A., & Cottrell, D. (1996). Self directed learning. *Archives of Disease in Childhood, 74*(4), 357-359. https://doi.org/10.1136/adc.74.4.357

Tunney, M., & Bell, H. M. (2011). Self-directed learning: preparing students for lifelong learning. *Pharmacy Education, 11*(1), 12-15.

Turkey Student Selection and Placement Center (2020). *2020-Higher education programs and quotas guide. https://www.osym.gov.tr/TR,19431/2020-yuksekogretim-kurumlari-sinavi-yks-yuksekogretim-programlari-ve-kontenjanlari-kilavuzu.html*

UNCTAD [United Nations Commission on Science and Technology for Development]. *Issues paper on the impact of rapid technological change on sustainable development.* United Nations Publishing.

UNESCO [United Nations Educational, Scientific and Cultural Organization]. (2020). https://en.unesco.org/covid19/educationresponse

UNESCO [United Nations Educational, Scientific and Cultural Organization]. (2015). *Education 2030: Incheon Declaration and framework for action towards inclusive and equitable quality education and lifelong learning for all.* UNESCO Publishing.

UNESCO [United Nations Educational, Scientific and Cultural Organization]. (1996). *Learning: The treasure within.* UNESCO Publishing.

Vygotsky, L. S. (1978). *Mind in society.* Cambridge, MA: Harvard University Press.

Watson, L. (2003). *Lifelong learning in Australia.* Canberra: Department of Education, Science and Training.

Yaman, F., & Yazar, T. (2015). Investigating of life long learning tendency of teachers (The example of Diyarbakır). *Kastamonu Education Journal, 23*(4), 1553-1566.

Yilmaz, H., & Celik, E. H. (2009). *Structural Equation Modeling with LISREL-I.* Pegem Academy.

Yılmaz, R., & Karaoğlan-Yılmaz, F. G. (2019, June). *Öğretmen adaylarının hayat boyu öğrenme eğilimleri ile kendi kendine öğrenme hazırbulunuşluklarının incelenmesi.* VIth International Eurasian Educational Research Congress, Ankara University, Ankara.

Yuksel, S., Gündoğdu, K., Akyol, B., & Akar-Vural, R. (2016). Content analysis of thesis and articles related to lifelong learning: 2000-2015. *Erzincan University Journal of Education Faculty*, *18*(2), 1491-1513. https://doi.org/10.17556/jef.88957

Zabihi, R., & Khodabakhsh, M. (2019). L2 Teachers' traditional versus constructivist teaching/learning conceptions and teacher burnout. *Current Psychology, 38,* 347-353.