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The Effect of Primary School Teachers Using Online Education on Their Professional Creativity

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Abstract: This study aims to examine the effect of online education on the professional creativity of primary school teachers. The research was carried out in a mixed method. The study group of the research consisted of 319 primary school teachers who work in various primary schools in Zhetysu Region, Kazakhstan, and have online education experience. The data collection tools of the research were the teacher creativity scale, whose Kazakh language validity was provided by the researchers, and the semi-structured interview form. The analysis of the quantitative data of the research was carried out with SPSS 25 statistical program. Content analysis was performed for the analysis of the qualitative data of the studies. As a result of the research, it was determined that the creativity levels of primary school teachers were high. According to the seniority variable among primary school teachers, it was determined that the creativity levels of those with medium seniority were higher than the others. The vast majority of teachers stated that online education has a positive effect on professional creativity. The study recommends increasing the creativity level of primary school teachers, by establishing in-service training programs for all teachers, especially those who are in the first and last years of their professions.

Keywords: *online education, primary school, professional creativity, teachers.*

Introduction

Raising useful individuals for society is possible with a modern education perspective that starts in the early period (Harangus, 2021). One of the most important duties of teachers in the process of adopting this understanding is to make an effort to gain various skills and qualifications primarily for themselves and their students, and then to the society and environment they live in (Domingo and Gargante, 2016). In contemporary societies, teachers are not only mechanical officials responsible for education and training, but also role models who shed light on the society they live in (Dandashly et al., 2019). One of the most important learning goals is to encourage children to be creative. Effective participation of teachers is very important for the realization of this goal. Creativity is the first factor in the development of a society (Henriksen et al., 2017). Instructors must be attentively focused on creativity and have a thorough understanding of its definition and development to do this.

Theoretical and conceptual framework

Creativity is the ability to purposefully imagine an original product, to do something in different ways than anyone else, and to develop new ideas (Bereczki and Karpati, 2018). Creativity is also defined as a quality that emerges with unconventional thinking, original behavior, and products (Rubenstein et al., 2018). When creativity is perceived as a product of thought, it refers to the process of reconstructing

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ideas that have not been linked to meaning before. Considered an original behavior output, it is the reinterpretation of old experiences according to original behavior patterns (Perry and Karpova, 2017). Creativity is a process that includes features such as flexibility, multidimensional thinking, sensitivity, alertness to the environment and people, fluency, comfort, quick and independent thinking, originality, and reaching different and different results. Using data wisely, arranging it, solving problems with flexible approaches, and putting forth an original product, fluency in expressions are the characteristics inherent in creativity. The fact that all of these features can be developed through education increases the importance of creativity in education (Perry and Karpova, 2017;Tran et al., 2017). Creative thinking includes both intellectual, affective, and behavioral products. In the information age, it is of great importance to raise individuals who think critically and produce and question information (Craft et al., 2014). Thus, expectations from education have begun to differ. The aim of education is not only to acquire knowledge but also to raise individuals who think differently, flexible, original, and creative (Mola and Dagnew, 2020). In this context, education programs and teachers have been involved in efforts to improve creativity in children (Mullet et al., 2016).

Teacher creativity is defined as teaching by trying originality in the teaching process and using imagination and problem-solving abilities (Lapeniene and Bruneckiene, 2010). A creative teacher is considered to be innovative, multi-faceted, open to change, not afraid to express his views, and open-minded (Cheung, 2012). In creative teaching, teachers use creative approaches to make the lesson more interesting, enjoyable, and effective. Teachers can be highly creative in developing materials and methods to encourage students (Ozcinar et al., 2020; Newton, 2013). Creative teaching emerges when the teacher transforms the existing knowledge into a new form for the student to understand. Raising individuals who can think, apply knowledge, produce, and solve problems depends on the teacher's application of different teaching approaches rather than direct teaching in the classroom (Songkram, 2015). It can be more effective for teachers to use creative thinking as a teaching tool in the teaching process. Methods and techniques used in each lesson, tools and materials, resources, and activities, among other things, make it easier to use creativity as a whole and usual teaching tool (Laisema and Wannapiroon, 2014).

Distance education, with its most general and simple definition, is the formal education process where students and teachers are not physically in the same place (Uaidullakyzy, 2021). In the distance education process, students and teachers physically connect by making use of teaching resources and interactive communication technologies in different environments (Bhuyan, 2021; Selvaraj et al., 2021). Distance education has conceptual aims such as creating new educational opportunities, combining work and education, creating equal opportunities in education, providing lifelong learning, incorporating educational technologies into the process, providing individual and mass education opportunities, and making education effective, efficient, and cost-effective (Izmagambetova et al., 2022). The effect of online education applications, which are known to have many advantages and disadvantages on teacher creativity is an important research topic.

Related research

Edinger (2008), in his study on teacher behaviors nurturing creativity in secondary school classes, evaluated teacher behaviors that are effective in the development of creative thinking. The results revealed that the teachers participating in the research exhibit behaviors that foster creativity at a moderate level. Pelfrey (2011) evaluated the classroom behaviors of primary school teachers defined as creativity enhancers. The researcher concluded that teachers should encourage their students to explore by creating creative products. Davies et al., (2014) conducted a study on teachers' roles and development needs to support creativity. As a result of the research, it was emphasized that teachers play a key role in the development of creative thinking skills and that they should provide versatile support.

Aish (2014) studied teachers' beliefs about creativity in primary education. As a result of the research, it was determined that teachers emphasized originality in creativity, that creativity is related to art and that, it forms the basis for academic learning. Colley (2015) evaluated the teaching practices for creativity in primary schools in developing creativity and revealed that teachers aim to enrich the learning process activities. Guiller et al., (2008) investigated the effects of online and classroom discussions on students' critical thinking skills.

Important research on creativity and online education can be listed as follows. Carter (2008)

compared the creative thinking dispositions of the students before and after the online course and revealed that the applied online courses did not cause any increase in the students' creative thinking dispositions. Maor et al. (2023) examined whether teachers integrate metacognition and creativity in their online lessons more than in classroom instruction. Gu et al (2023) developed and examined an online creativity training program, which employed a comprehensive training approach and consisted of twenty self-instructional exercises delivered throughout five weeks. In her study, Wu (2022) conducted one of the first studies that used an online interactive creativity task platform to explore a person's creativity performance in paired player mode.

It is very important for teachers to constantly improve their professional creativity. As it is known, it has become of great importance for teachers to have online education skills during and after the COVID 2019 period. It can be argued that teachers' ability to use their creativity in online teaching skills and provide effective and efficient teaching makes it easier for students to learn. When we look at the studies carried out in this direction in recent years, we see that the focus is on online learning and creativity. However, when we look at the literature carefully, it is seen that there are research gaps regarding the extent to which the professional creativity of primary school teachers is effective in the online education they provide.

Purpose of the research

The purpose of this research was to examine the effect of online education on the professional creativity of primary school teachers. The research seeks answers to the following research questions.

1. What are the teachers' creativity scale mean scores?
2. Do teachers' creativity levels differ according to the variable of professional seniority?
3. How do teachers evaluate the impact of online education on their professional creativity?
4. How do teachers evaluate the advantages of online education that enable the development of professional creativity?
5. How do teachers evaluate the disadvantages of online education that prevent the development of professional creativity?

Materials and Methods

In this section, information on the method of the research, the study group, the data collection tools, the stages of data collection and processing, and the ethical principles of the research are presented.

Research method

This research was carried out in a mixed method. In the field of health, social, and behavioral sciences, where the researcher collects both quantitative data (closed-ended) and qualitative data (open-ended) to understand research problems, integrates two datasets, and then draws conclusions using the advantages of integrating these two datasets. The basic assumption of this approach is that combining statistical trends (quantitative data) with stories and personal experiences (qualitative data) will be more advantageous than using either of these methods alone to better understand the research problem (Doyle et al., 2009). Accordingly, in this study, while the creativity levels of teachers were obtained by the quantitative method, the effect of online education on their professional creativity was evaluated by the qualitative method.

Participants

The quantitative study group of the research consists of 319 primary school teachers working in various primary schools in the city of Zhetysu Region, Kazakhstan, in the 2022-2023 academic years and having online education experience. The qualitative part of the research was carried out by selecting 25 teachers by random sampling method among 319 teachers participating in the research. The demographic characteristics of the teachers participating in the research are given in Table 1.

Table 1. *Demographic characteristics of primary school teachers*

Gender	F	%
Woman	319	100
Professional Seniority		
1–5 years	88	27.6
6–10 years	95	29.8
11–15 years	76	23.8
16 years and above	60	18.8

Demographic characteristics of primary school teachers participating in the research are given in Table 1. All (100%) of the primary school teachers participati ng in the research are women. 88.2 of the primary school teachers participating in the research have professional seniority between 1 and 5 years (27.6%), 95 of them have professional seniority between 6 and 10 years (29.8%), 76 of them have professional seniority between 11 and 15 years (% 23.8), and 60 of them have 16 years or more professional seniority (18.8%).

Data collection tools

Teacher Creativity Scale

"Teacher Creativity Scale," one of the data collection tools of the research, was developed by Uçar (2015). The following steps were followed while establishing the language validity of the scale.

- Translation: At this stage, the "Teacher Creativity Scale" (Uçar, 2015) was translated into Kazakh using a 5-stage technique. This process consists of the steps of first translation, first translation evaluation, back translation, back translation evaluation, and expert opinion. The first translation of the Teacher Creativity Scale was carried out by 2 experts who were familiar with the cultural, psychological, and grammatical differences in both languages. Afterward, the translation was evaluated and the scale was translated back into its original language. After the back translation was carried out, the final translation was evaluated and it was decided that the scale was ready for pilot application.
- Establishment of the Pilot Practice Sample Group: At this stage, 307 primary school teachers experienced in the field of online education formed the pilot implementation sample group to pilot the scale. Primary school teachers included in the pilot study sample group were excluded from the main sample group of the study.
- Exploratory Factor Analysis: The SPSS 25.0 statistical program was used in exploratory factor analysis. In the exploratory factor analysis, the suitability of the data set for the analysis was evaluated. Kaiser-Meyer - Olkin (KMO) and Barlett Sphericity tests were used. In Kaiser-Meyer tests, the Olkin (KMO) coefficient should be between 0.80-0.90 for the sample size, and in Barlett tests, the Sphericity test should be significant at the .05 level (Hadi et al., 2016). In the Kaiser Meyer analysis, since the Olkin (KMO) coefficient was 0.84 and the Barlett sphericity test was $p<0.05$, the null hypothesis was rejected and it was accepted that the correlation matrix was not a unit matrix. Finding statistically significant data shows that it is suitable for factor analysis. As a result of the exploratory factor analysis, it was determined that the scale items were grouped under 3 factors with an eigenvalue greater than 1. The factor loadings of the first factor of the scale, which includes 10 items and is called "Expertise," ranged from 0.65 to 0.77. The factor loads of the second factor of the scale, which includes 10 items and is called "Creative Thinking Skill," vary between 0.59 and 0.79. It was determined that the third factor, which consists of 8 items and is called "Motivation," had factor loads ranging from 0.73 to 0.86.
- Confirmatory Factor Analysis: SPSS Amos in Confirmatory Factor Analysis 25.0 statistics program was used. To accept the confirmatory factor analysis results as valid, the goodness of fit indices of the model must be sufficient. The goodness of Fit Index (GFI), Normed Fit Index (NFI), Relative Fit Index (RFI), Comparative Fit Index (CFI), and Incremental Fit Index (IFI) values greater than 0.90 indicate that there is sufficient fit, and the values decrease to 0. Approximate bad, approaching 1 perfectly fit root mean square Residuals (SRMR) and Root mean square. If the Error of Approximation (RMSEA) is less than 0.05, it is stated that it has a good fit, if it is below 0.10, it is an acceptable goodness of fit, and the ratio of the Chi-square value to the degree of freedom is less than 5 (Schermelleh-Engel et

al., 2003). As a result of the confirmatory factor analysis, it was determined that the ratio of the Chi-square value to the degrees of freedom had a sufficient level below 5. The fit index values were found to be RMSEA=0.04, SRMR= 0.03, GFI=0.97, NFI=0.93, RFI=0.91, CFI=0.93, and IFI=0.98. When the goodness of fit indices obtained as a result of confirmatory factor analysis was examined, the model was determined to be compatible.

- Reliability Study: The consistency of the scale was checked with the Cronbach alpha internal consistency coefficient. The Cronbach's alpha internal consistency coefficient of the "Expertise" factor was 0.82, the Cronbach's alpha internal consistency coefficient of the "Creative Thinking Skill" factor was 0.85, and the Cronbach's alpha internal consistency coefficient of the "Motivation" factor was 0.88. The Cronbach alpha internal consistency coefficient for the Teacher Creativity Scale was found to be 0.84 in general. When calculating the score of the 5-point Likert-type scale, "strongly agree" was determined as 5, "strongly agree" 4, "moderately agree" 3, "little agree" 2, and "strongly disagree" 1 point. Item score ranges were accepted as equal, between 1.00-1.79 "I strongly disagree," 1.80–2.59 "I agree little," 2.60–3.39 "moderately agree," 3.40–4.19 "strongly agree," and 4.20- Between 5.00 and 5.00 was formed as "totally agree".

The Effect of Online Education on Teacher Creativity Semi-Structured Interview Form

"The Effect of Online Education on Teacher Creativity Semi-Structured Interview Form" was developed by the researchers to collect the qualitative data for the study. Opinions of 3 experts were taken to determine the content validity of the three semi-structured interview questions created during the development of the semi-structured interview form. Interview questions organized in line with expert opinions were applied to 4 primary school teachers and the clarity of the questions was evaluated. The semi-structured interview form was given its final form with the opinions of the teachers. The semi-structured interview form prepared to be used in the research is given in Table 2.

Table 2. *The effect of online education on teacher creativity semi-structured interview form*

1. How do you evaluate the impact of online education on teachers' professional creativity? Give your opinion by choosing one of the options below.		
Very effective in a positive way ()		Positively effective ()
Ineffective ()	Negatively effective ()	Very effective in the negative direction ()
Teacher's opinion:		
2. How do you evaluate the advantages of online education that enable the development of professional creativity? Teacher's opinion		
3. How do you evaluate the disadvantages of online education that prevent the development of professional creativity? Teacher's opinion:		

The Effect of Online Education on Teacher Creativity in semi-structured interview form is given in Table 2. The form includes 1 closed and open-ended question and 2 open-ended questions.

Data collection process

Research data were collected in two stages. The first of these is the pilot implementation phase of the Teacher Creativity Scale, which was adapted into language for use in the research. In the second stage, primary school teachers who constituted the sample group of the research were studied. Data collection tools were delivered to the teachers through Google Forms. It took approximately 3 months for all data to be collected and delivered to the researchers.

Compliance with Ethics

At every stage of the research, an understanding of research by ethical principles was displayed. Necessary permissions were obtained for the language adaptation study of the Teacher Creativity Scale, whose language validity was established to collect the research data. A consent form was obtained from all primary school teachers who participated in the study, stating that they voluntarily participated in the study. In addition, a statement was made to the participants that the research data and personal information would be kept confidential and not used for any other purpose or anywhere.

Data analysis

The analysis of the quantitative data of the research was carried out with the SPSS 25.0 statistical program. In addition to percentage, frequency and mean calculations, one-way analysis of variance (ANOVA) were applied. Content analysis was performed for the analysis of the qualitative data of the studies. The process of content analysis is to bring together similar data within the framework of certain concepts and themes and to present them in a way that the reader can comprehend (Stemler, 2000). In this direction, the effect of online education on teacher creativity was presented by transforming the data obtained from the semi-structured interview form into frequency and percentage tables with content analysis.

Results

In this section, the findings obtained with the Teacher Creativity Scale and the Effect of Online Education on Teacher Creativity Semi-Structured Interview Form are given.

Findings Regarding the Teacher Creativity Scale

In Table 3, the weighted average and standard deviations of the primary school teachers participating in the research regarding the overall teacher proficiency scale and its sub-dimensions are given.

Table 3. *Weighted mean and standard deviations of the teacher creativity scale*

	M	**SS**
Expertise	3.68	0.773
Creative Thinking Skill	3.77	0.791
Motivation	3.59	0.834
Teacher creativity scale	3.69	0.698

In Table 3, the sub-dimension of expertise (*M*=3.68, SS=0.773), the sub-dimension of creative thinking skills (*M*=3.77, SS=0.791), the sub-dimension of motivation (*M*=3.59, SS=0.834) and the overall scale of teacher creativity (*M*=3.69, SS=0.698) weighted average and standard deviations are given. From this point of view, it has been determined that primary school teachers have a high degree of creativity in the teacher creativity scale sub-dimensions and overall.

According to the professional seniority variable of primary school teachers participating in the research in Table 4, a one-way analysis of variance, ANOVA results is given.

Table 4. *One-way analysis of variance ANOVA results*

Class	**N**	***M***	**SS**	**F**	**P**
1–5 years	88	3.29	0.839	16.552	0.000
6–10 years	95	4.08	0.677		
11–15 years	76	4.01	0.682		
16 years and above	60	3.26	0.848		

In Table 4, the creativity of primary school teachers participating in the research was evaluated according to the variable of professional seniority. As a result of one-way analysis of variance ANOVA, it was determined that the creativity of primary school teachers showed a significant difference according to the variable of professional seniority (F=16.552, P<0.5). It was determined that the significant difference was in favor of primary school teachers with 6–10 years and 11–15 years of professional seniority.

The Effect of Online Education on Teacher Creativity Findings Regarding the Semi-Structured Interview Form

In Table 5, the evaluations of the primary school teachers participating in the research regarding the effect of online education on professional creativity are given.

Table 5. *Evaluations of primary school teachers on the effect of online education on professional creativity*

Category	F	%
Very effective in a positive way	4	16
Positively effective	14	56
Ineffective	5	20
Negatively effective	2	8
Negatively very effective	-	-
Total	25	100

In Table 5, the views of primary school teachers participating in the research on the effect of online education on professional creativity are categorized. 16% of primary school teachers answered very effectively in a positive way, 56% in a positive way, 20% ineffective and 8% in a negative way. Among the teachers participating in the research, no teacher stated that online education hurts professional creativity.

In Table 6, the evaluations of the primary school teachers participating in the research regarding the advantages of online education that enable the development of professional creativity are given.

Table 6. *Primary school teachers' evaluations of the advantages of online education that enable the development of professional creativity.*

Category	F	%
Offers the opportunity to combine technology with professional knowledge	19	76
Allows the use of abilities	13	52
Encourages the development of different methods	10	40
Allows multidimensional thinking	7	28
Provides a review of habits	6	24
Improves the ability to find solutions	4	16
Improves the ability to think flexibly	2	8

In Table 6, the evaluations of the primary school teachers participating in the research regarding the advantages of online education that enable the development of professional creativity are categorized. About 76% of the teachers answered that it offers the opportunity to combine technology with professional knowledge, 52% allows the use of talents, 40% encourages the development of different methods, and 28% provides multidimensional thinking. About 24% of the teachers provided the review of habits, 16% answered that it develops the ability to produce solutions, and 8% answered that it develops the ability to think flexibly.

In Table 7, primary school teachers' evaluations of the disadvantages of online education that prevent the development of professional creativity are given.

Table 7. *Evaluations of primary school teachers about the disadvantages of online education that prevent the development of professional creativity.*

Category	F	%
Blocks interaction	16	64
Restricts the learning environment	15	60
Makes classroom management difficult	11th	44
Makes material development difficult	9	36
Deprives the opportunities and opportunities of the classroom environment	8	32
limits the imagination	5	20
Limits the student assessment process	2	8
Does not create an environment of cooperation and trust	1	4

In Table 7, the evaluations of the primary school teachers participating in the research regarding the disadvantages of online education that prevent the development of professional creativity are categorized. About 64% of the teachers answered that it prevents interaction, 60% limits the learning environment, 44% makes classroom management difficult, 36% makes it difficult to develop materials, and 32% deprives the classroom environment of opportunities and opportunities. About 20% of the teachers answered that they limit their imagination, 8% limit the evaluation process of the student, and 4% do not create an environment of cooperation and trust.

Discussions

The primary school teachers participating in the research showed a high degree of creativity in the teacher creativity scale sub-dimensions and in general. This finding corroborates the results of previous studies. Kaufman (2006) and Aljughaiman (2002) aimed to reveal teachers' creativity perceptions in their research. As a result of the researches, it was revealed that teachers have positive perceptions and tendencies about creativity. As a result of the research conducted by Mullet et al., (2016), it was revealed that teachers attach importance to creative thinking and consider it valuable, but they do not know theories and research related to creative thinking.

The findings obtained from the research reveal that, there is a significant difference in favor of primary school teachers who have professional seniority of 6–10 years and 11–15 years according to the variable of professional seniority. Polat (2017), in his study with classroom teachers, found that the creativity levels of classroom teachers differ according to their professional seniority. As a result of the research, the creativity score averages of teachers with 11–15 years and 16–20 years of seniority were found to be higher than teachers with 1–5 years of seniority.

The majority of primary school teachers stated that online education had a positive effect on professional creativity. Providing the opportunity to combine technology with professional knowledge, enabling the use of talents, encouraging the development of different methods, providing multidimensional thinking, reviewing habits, developing the ability to produce solutions, and thinking flexibly are the answers given by primary school teachers to the advantages of online education that enable the development of professional creativity. In similar studies conducted in the field, it is shown as an important advantage that online education allows teachers to develop by contributing to their technology knowledge (Zuhairi et al., 2006; De Paepe et al., 2018).

The primary school teachers participating in the research, on the disadvantages of online education that prevent the development of professional creativity expressed it as preventing interaction, restricting the learning environment, making classroom management difficult, making it difficult to develop materials, depriving the opportunities and opportunities of the classroom environment, limiting the imagination, limiting the evaluation process of the student, and not creating an environment of cooperation and trust. In his study, Attr (2012) revealed that the communication between the student and the teacher and the need to increase the in-class interaction in distance education activities, this situation negatively affects the use of the teacher's potential. In their research, De Alencar and Oliveira (2016) also stated that teacher candidates and teachers realized the importance of creativity skills, but they encountered some problems in developing this skill in the learning-teaching process.

Conclusion

In this study, the effect of online education on primary school teachers' professional creativity was examined. In the quantitative dimension of the research, the creativity levels of primary school teachers were examined according to the professional seniority, while the effect of online education on creativity was evaluated in the qualitative dimension. As a result of the research, it was determined that the creativity levels of primary school teachers were high. According to the seniority variable among primary school teachers, it was determined that the creativity levels of those with medium seniority were higher than the others. The vast majority of teachers stated that online education has a positive effect on professional creativity.

Providing the opportunity to combine technology with professional knowledge, enabling the use

of talents, and encouraging the development of different methods are stated by the majority of teachers as the advantages of online education that enable the development of professional creativity. Preventing interaction, restricting the learning environment, making classroom management difficult, making material development difficult, and depriving the classroom environment of opportunities and opportunities are the answers given by the majority of primary school teachers to the disadvantages of online education that prevent the development of professional creativity.

Higher education programs that train teachers should be developed according to the requirements of the age so that primary school teachers, who are the most important step in shaping the society and raising qualified manpower, have high-level thinking skills such as creativity following the requirements of the information age. To increase the creativity level of primary school teachers, in-service training programs should be established for all teachers, especially those who are in the first and last years of their profession. In addition, the educational content to be created to eliminate the negative effects of online education on the professional creativity of primary school teachers should be included in in-service training programs.

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Conflict of interests

The authors declare no conflict of interest.

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Author Contributions

Conceptualization, A.K and G.Z; methodology, H.U.; software, H.U. and U.A.; formal analysis, H.U. and U.A.; writing—original draft preparation, A.K. and G.Z.; writing—review and editing, H.U. and U.A. All authors have read and agreed to the published version of the manuscript.

References

Aish, D. (2014). *Teachers' Beliefs about Creativity in the Elementary School Classroom* (Doctoral Thesis), Pepperdine University. https://www.proquest.com/openview/71e635738b1b40a3e1ae53ea963b4384/1?pq-origsite=gscholar&cbl=18750

Aljughaiman, A. M. (2002). *Teachers' Perceptions of Creativity and Creative Students.* (PhD Thesis), University of Idaho. https://www.proquest.com/openview/ffc011213b8bbabb4f03f4dde4877477/1?pq-origsite=gscholar&cbl=18750&diss=y

Attr, A. K. (2012). Distance education: Problems and solution. *International Journal of Behavioral Social and Movement Sciences*, *1*(4), 42-58. https://www.ijobsms.org/index.php/ijobsms/article/view/53

Bereczki, E. O., & Karpati, A. (2018). Teachers' beliefs about creativity and its nurture: A systematic review of the recent research literature. *Educational Research Review*, *23*, 25-56. https://doi.org/10.1016/j.edurev.2017.10.003

Bhuyan, M. H. (2021). Practices of online teaching, learning and assessment of the students of the BSc in EEE programme during the COVID-2019 pandemic. *Contemporary Educational Research Journal*, *11*(2), 14-28. https://doi.org/10.18844/cerj.v11i2.5899

Carter, L. M. (2008). Critical thinking dispositions in online nursing education. *Journal of Distance Education*, *22*(3), 89-114. https://www.eric.ed.gov/?id=EJ812567

Cheung, R. H. P. (2012). Teaching for creativity: Examining the beliefs of early childhood teachers and their influence on teaching practice. *Australasian Journal of Early Childhood*, *37*(3), 43-52. https://doi.org/10.1177/183693911203700307

Colley, K. M. (2015). *Cultivating Creativity: The Practice of Teaching for Creativity in the Elementary School Classroom* (Doctoral Thesis), University of Denver. https://www.proquest.com/openview/17c776c0303d6bc89f8fd71aa24f3686/1?pq-origsite=gscholar&cbl=18750

Craft, A., Cremin, T., Hay, P., & Clack, J. (2014). Creative primary school: Developing and maintaining pedagogy for creativity.

Ethnography and Education, *9*(1), 16-34. https://doi.org/10.1080/17457823.2013.828474

Dandashly, N. A., Barbar, A., & Antoun, M. (2019). The effects of using blogs and webquests in teaching education postgraduate courses. *Global Journal of Information Technology: Emerging Technologies*, *9*(1), 012-019. https://doi.org/10.18844/gjit.v9i1.4018

Davies, D., Jindal-Snape, D., Digby, R., Howe, A., Collier, C., & Hay, P. (2014). The roles and development needs of teachers to promote creativity: A systematic review of literature. *Teaching and Teacher Education*, *41*, 34-41. https://doi.org/10.1016/j.tate.2014.03.003

De Alencar, E. M. L. S., & de Oliveira, Z. M. F. (2016). Creativity in higher education according to to graduate programs' professors. *Universal Journal of Educational Research*, *4*(3), 555-560. https://www.eric.ed.gov/?id=EJ1092350

De Paepe, L., Zhu, C., & DePryck, K. (2018). Drop-out, retention, satisfaction and attainment of online learners of Dutch in adults education. *International Journal on E-Learning*, *17*(3), 303-323. https://www.learntechlib.org/p/174173

Domingo, M. G., & Garganté, A. B. (2016). Exploring the use of educational technology in primary education: Teachers' perception of mobile technology learning impacts and applications' use in the classroom. *Computers in Human Behavior*, *56*, 21-28. https://doi.org/10.1016/j.chb.2015.11.023

Doyle, L., Brady, A. M., & Byrne, G. (2009). An overview of mixed methods research. *Journal of Research in Nursing*, *14*(2), 175-185. https://doi.org/10.1177/1744987108093962

Edinger, M. J. (2008). *An Exploratory Study of Creativity-Fostering Teacher Behaviors in Secondary Classrooms*. The College of William and Mary. https://www.proquest.com/openview/ee8ac3746011be838a06c966a5290915/1?pq-origsite=gscholar&cbl=18750

Gu, X., Ritter, S.M. & Dijksterhuis, A. (2024). Online Creativity Training: Examining the Effectiveness of a Comprehensive Training Approach. *Int J Technol Des Educ* **34**, 403–426 https://doi.org/10.1007/s10798-023-09820-2

Guiller, J., Durndell, A., & Ross, A. (2008). Peer interaction and critical thinking: face-to-face or online discussion? *Learning and Instruction*, *18*(2), 187-200. https://doi.org/10.1016/j.learninstruc.2007.03.001

Hadi, N. U., Abdullah, N., & Sentosa, I. (2016). An easy approach to exploratory factor analysis: Marketing perspective. *Journal of Education and Social Research*, *6*(1), 215. https://www.mcser.org/journal/index.php/jesr/article/view/8799

Harangus, K. (2021). Assessing competence in teacher education: Development of university students' problem solving skills. *New Trends and Issues Proceedings on Advances in Pure and Applied Sciences*, *8*(2), 102-110. https://doi.org/10.18844/ijire.v8i2.6806

Henriksen, D., Richardson, C., & Mehta, R. (2017). Design thinking: A creative approach to educational problems of practice. *Thinking Skills and Creativity*, *26*, 140-153. https://doi.org/10.1016/j.tsc.2017.10.001

Izmagambetova, R., Roza, N., Kenzhekhan, M., Tursynay, B., & Raissa, K. (2022). The problem of evaluating primary school students in the online education process. *Cypriot Journal of Education Sciences*, *17*(1), 255-267. https://doi.org/10.18844/cjes.v17i1.6704

Kaufman, J. C. (2006). Self-reported differences in creativity by ethnicity and gender. *Applied Cognitive Psychology: The Official Journal of the Society for Applied Research in Memory and Cognition*, *20*(8), 1065-1082. https://doi.org/10.1002/acp.1255

Laisema, S., & Wannapiroon, P. (2014). Design of collaborative learning with creative problem-solving process learning activities in a ubiquitous learning environment to develop creative thinking skills. *Procedia-Social and Behavioral Sciences*, *116*, 3921-3926. https://doi.org/10.1016/j.sbspro.2014.01,867

Lapeniene, D., & Bruneckiene, J. (2010). Teachers' creativity in the domain of professional activity analysis of individual factors. *Economics and Management*, *15*, 642-649.

Maor, R., Levi, R., Mevarech, Z., Paz-Baruch, N., Grinshpan, N., Milman, A., Shlomo, S. & Zion, M. (2023). Difference between zoom-based online versus classroom lesson plan performances in creativity and metacognition during COVID-19 pandemic. *Learning Environ Res 26,* 803–822, https://doi.org/10.1007/s10984-023-09455-z

Mola, S., & Dagnew, A. (2020). The status of teachers' motivation and process of quality education: The case of primary school teachers, Ethiopia. *Global Journal of Guidance and Counselling in Schools: Current Perspectives*, *10*(1), 1-11. https://doi.org/10.18844/gjgc.v10i1.4448

Mullet, D. R., Willerson, A., Lamb, K. N., & Kettler, T. (2016). Examining teacher perceptions of creativity: A systematic review of the literature. *Thinking Skills and Creativity*, *21*, 9-30. https://doi.org/10.1016/j.tsc.2016.05.001

Newton, D. P. (2013). Moods and creative thinking: A framework for teaching. *Thinking Skills and Creativity*, *8*, 34-44. https://doi.org/10.1016/j.tsc.2012.05.006

Ozcinar, Z., Sakhieva, R. G., Pozharskaya, E. L., Popova, O. V., Melnik, M. V., & Matvienko, V. V. (2020). Student's Perception of Web 2.0 Tools and Educational Applications. *International Journal of Emerging Technologies in Learning (iJET)*, 15(23), pp. 220–233. https://doi.org/10.3991/ijet.v15i23.19065

Pelfrey, R. (2011). *Classroom Behaviors in Elementary School Teachers Identified as Fostering Creativity.* (Doctoral Thesis), Northern Kentucky University. https://www.proquest.com/openview/887d3680d368dccfa59a167985d4b221/1?pq-origsite=gscholar&cbl=18750

Perry, A., & Karpova, E. (2017). Efficacy of teaching creative thinking skills: A comparison of multiple creativity assessments. *Thinking Skills and Creativity*, *24*, 118-126. https://doi.org/10.1016/j.tsc.2017.02.017

Polat, M. (2017). *Examining the Critical Thinking Dispositions and Creativity Levels of Classroom Teachers According to Some Variables* (Doctoral dissertation), Adıyaman University. https://www.dspace.adiyaman.edu.tr:8080/xmlui/handle/20.500.12414/1860

Rubenstein, L. D., Ridgley, L. M., Callan, G. L., Karami, S., & Ehlinger, J. (2018). How teachers perceive factors that influence creativity development: Applying a social cognitive theory perspective. *Teaching and Teacher Education*, *70*, 100-110. https://doi.org/10.1016/j.tate.2017.11.012

Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online*, *8*(2), 23-74. https://www.stats.ox.ac.uk/~snijders/mpr_Schermelleh.pdf

Selvaraj, A., Radhin, V., Nithin, K. A., Benson, N., & Mathew, A. J. (2021). Effect of pandemic based online education on teaching and learning system. *International Journal of Educational Development*, *85*, 102444. https://doi.org/10.1016/j.ijedudev.2021.102444

Songkram, N. (2015). e-Learning system in virtual learning environment to develop creative thinking for learners in higher education. *Procedia-Social and Behavioral Sciences*, *174*, 674-679. https://doi.org/10.1016/j.sbspro.2015.01.600

Stemler, S. (2000). An overview of content analysis. *Practical Assessment, Research, and Evaluation*, *7*(1), 17. https://doi.org/10.7275/z6fm-2e34

Tran, T. B. L., Ho, T. N., Mackenzie, S. V., & Le, L. K. (2017). Developing assessment criteria of a lesson for creativity to promote teaching for creativity. *Thinking Skills and Creativity*, *25*, 10-26. https://doi.org/10.1016/j.tsc.2017.05.006

Uaidullakyzy, E. (2021). Formation of information and professional competence of primary school teachers with Online Education. *World Journal on Educational Technology: Current Issues*, *13*(4), 838-850. https://doi.org/10.18844/wjet.v13i4.6269

Uçar, R. (2015). *The Relationship between Primary School Principals' Distributed Leadership behaviors and Teachers' Motivation and Creativity Levels* (Diyarbakır province example), (PhD Thesis), Diyarbakır, Turkey. https://www.tez.yok.gov.tr/UlusalTezMerkezi/tezSorguSonucYeni.jsp

Wu, C.-L. (2022). How is One Plus One More than Two? The Interaction between Two Players in Online Co-Creativity Tasks. Educational Technology & Society, 25 (3), 60-70. https://doi.org/10.30191/ETS.202207_25(3).0005

Zuhairi, A., Wahyono, E., & Suratinah, S. (2006). The historical context, current development, and future challenges of distance education in Indonesia. *Quarterly Review of Distance Education*, *7*(1), 95-101. https://www.learntechlib.org/p/106683