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Adaptation of creative self-efficacy scale into Turkish language

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Abstract

The purpose of this study was to develop a Turkish version of the Creative Self-Efficacy Scale (CSES) and to explore its psychometric properties. Participants were 489 preservice teachers enrolled in a public university in Turkey (n = 489). Two-hundred-thirty-five of 489 preservice teachers (48.06%) participated in the first study for the exploratory factor analysis (EFA), and 254 (51.94%) participated in the second study for the confirmatory factor analysis. Two-hundred-sixty (53.2%) of the participants were studying in preschool teaching and 132 (46.8%) were studying in classroom teaching programs. CSES, which is a 3-item Likert-type English questionnaire, was translated into Turkish by the researcher. Eight researchers who were expert in Turkish education, English language teaching, educational measurement and evaluation, elementary education and educational technology fields participated in the back-translation and expert review processes. Scale scores did not differ according to sex, age, grade or department of the respondent. However, creative self-efficacy was observed to be related to design self-efficacy.

Keywords: Creativity, creative performance, creative self-efficacy, creative teaching, scale adaptation.

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1. Introduction

The most important activity performed by professionals in the schools is teaching. The research indicate that teaching matters (Stronge, Grant & Xu, 2015) and that 'teachers and their methods have very substantial effects on pupils' (Muijs & Reynolds, 2017, p. 7). Teaching quality is reported to account for the largest amount of variation in student achievement (Rivkin, Hanushek & Kain, 2005). In addition, teaching effectiveness (Muijs & Reynolds, 2017, p. 4) and teacher effectiveness (Stronge et al., 2015) are argued to have powerful effects in improving student achievement. Stronge et al. (2015, p. 44) reported that the magnitude of the impact of teacher effectiveness in student learning is 'larger than the effects associated with financial investment, class size, curriculum, school restructuring and many other educational interventions'. Therefore, teaching and teachers are frequently at the centre of national discourses (Jensen et al., 2019) and educational reform efforts aim to target teacher effectiveness to address the persistent achievement gaps (Darling-Hammond, 2000). Even though empirical findings from educational research on teacher effectiveness is impressive, they varied across studies (Weinert & De Corte, 2001) and have not given way to a standard definition of teacher effectiveness or an agreed-upon list of effective teaching qualities (Stronge et al., 2015). However; skilful abilities in content knowledge, pedagogical practices, culturally relevant pedagogy, meeting students' individual needs (Haynes, 2008), careful planning, using appropriate materials, communicating goals to students, maintaining a brisk pace, assessing student work regularly, time management, having coherent instruction strategies and using a variety of teaching strategies (Stronge et al., 2015) are considered to be characteristics associated with teacher effectiveness.

On the other hand, Muijs and Reynolds (2017, p. 4) stated that 'effective teaching is not being able to do a small number of 'big' things right but is rather doing a large number of 'little' things well'. Henriksen, Mishra and Fisser (2016) suggested that creativity is one of the most important skills that is required to 'do well' with succeeding in the 21st century education, especially when educational technology is taken into consideration. Most digital technologies, which are currently being used as educational technologies (Internet, social networking services, smartphones, productivity software, wiki and blogs or any other tool), were not designed for educational purposes (Mishra, Koehler & Kereluik, 2009). Therefore, it becomes an opportunity—and sometimes necessity—for the teachers to creatively redesign and repurpose existing technologies for educational purposes (Koehler et al., 2011). Moreover, keeping up with constantly changing technology and having to learn—and relearn—new technologies create a burden for teachers to integration technology into their teaching (Koehler & Mishra, 2008). It seems that creativity has become an indispensable ability for teachers, especially when technology integration is taken into account. Creativity is reported to be deemed, especially desirable in occupational and educational settings (Choi, Anderson & Veillette, 2009; Pace & Brannick, 2010; Vally et al., 2019). There has also been explicit focus on training programs designed to entrain creativity (Vally et al., 2019) and increasing research to support the importance of creativity in fields of thinking, learning and teaching creatively (Jeffrey & Craft, 2004; Williams, 2002). However, an unmet primary need for measuring creativity have been reported (Dutta et al., 2019; Mange, Adane & Sambre, 2016; Sohn, Kim & Jeon, 2016; Uptis, 2014; Vally et al., 2019). Hence, there is an accentuated need for tools for measuring creativity. Therefore, this research aimed at adapting Creative Self-Efficacy Scale (CSES, Tierney & Farmer, 2002) into Turkish language for providing Turkish researchers with a research tool that may be used for determining teachers' and other professionals' self-efficacy for creativity. CSES may be useful for explaining teachers' beliefs in their ability to teach creatively which in turn may provide insight into effective teaching and technology integration.

1.1. Creativity

Creativity is the overarching theme of the 21st century. Pink (2006) argued that after agricultural, industrial and information ages human society has entered the conceptual age which underscores the cruciality of creativity. Lewis (2008) stated that the creativity is a sought-after quality of thinking and an important aspect of innovation and change. LinkedIn, which is the most popular business and

employment-oriented service, carried out a research on its user data covering 660 million professionals and 20 million jobs and concluded that the creativity is the skill most demanded by organisations and most valued by the workforce (Pate, 2020). Creativity is a phenomenon that involves the production of novel and useful products (Mumford, 2003). It is defined as 'individuals (creators), processes (creating), and products (creations) with the features of usefulness, appropriateness, and novelty' (Tsai, 2012, p. 16). Creativity is also defined as a habit (Sternberg, 2012) or divergent thinking (Guilford, 1967).

Land and Jarman (1993) conducted a 15-year long longitudinal study and concluded that humans are naturally creative; however, non-creative behaviour is learned as individuals get older and older individuals are less creative compared to the younger ones. In a similar vein, Sternberg (2012, p. 4) argued that 'educational practices that seem to promote learning may inadvertently suppress creativity'. Considering that non-creative behaviours are learned as individuals get older, more insight is needed into the creativity in order to help professionals develop competencies that can contribute to doing their jobs creatively. Fortunately, creativity can be taught, learned and assessed (Cropley, Patston, Marrone & Kaufman, 2019). Individuals can also be encouraged to act creatively (Sternberg, 2012).

Creativity is an increasingly important issue for the education (Beghetto & Kaufman, 2016; Cropley et al., 2019). Henriksen et al. (2016) stated that the 'field of education must consider the applications and rationale of creative educational practice and policy, especially for 21st century, technology-rich contexts' (p. 27). Orhon (2014) argued that teachers need to have creative thinking skills. She also recommended that individuals wishing to become teachers should be tested for their creativity in order to enter teaching programs and teacher training institutions should measure preservice teachers' creative skills. In addition, Oral (2014) stated that schools and instructional programs should be arranged in a way that allows teachers to teach creatively. Moreover, Henriksen et al. (2016, p. 31) stated that 'educators must be creative in devising new ways of thinking about technology, particularly for teaching specific content'. Therefore, a research tool that can be used to produce knowledge that will contribute to gaining insight about creativity will be useful both for educational technology researchers and in general.

1.2. Creative self-efficacy

Rapid advances in science and technology have enabled information technology systems to continuously gain new information processing capabilities, and at the same time, to reach increasingly higher capacities in these capabilities. With these ever-increasing capabilities, information technology systems have begun to challenge humans' monopoly on logical and analytical thinking. Abbott (2010, p. 4) argued that many tasks which require logical or analytical thinking can be performed more quickly and less expensively by computers. He stated that 'this automation is even more challenging in the context of continuing trends towards assessment and accountability, especially in education'. Taylor (2019) reported that workers need to bring out creative skills to protect themselves from being replaced by new technologies, artificial intelligence, and automation. Marr (2018) too stated that jobs that require creativity are safe from replacement by computers. In a similar vein, World Economic Forum urges that building competencies in areas that computers will be unlikely to tackle effectively like creativity is likely the best way for surviving automation (Desjardins, 2018). Since non-creative skills can be automated, professionals without creativity will be left behind, and hence, expressing creativity and performing with creativity is crucial for success. However, some individuals feel helpless to increase their creative thinking and believe that creative performance is difficult and arduous (Abbott, 2010). In connection with this, people's beliefs about their own performance have been reported to guide their actions (Macakova & Wood, 2020). For instance, teachers' beliefs about creativity have been reported to be related to their instructional practices (Hong, Hartzell & Greene, 2009).

Beliefs about oneself have been reported to be related to and have predictive power on performance, learning and development (Gomez-Chacon, Garcia-Madruga, Vila, Elosua & Rodriguez, 2014; Peeters et al., 2008; Tuckman, 2003). Mercer (2008) states that a clear understanding of the nature of beliefs about oneself—self-beliefs—is crucial to the development of a sound teaching approach. One of those beliefs

is self-efficacy. Self-efficacy is defined as an individual's belief about his or her capability in effectively performing required behaviours to produce an outcome or effectively accomplishing a certain task (Bandura, 1977, 1995a; Pintrich, 1999). Bandura (1995a) lists the sources of self-efficacy beliefs as mastery experiences, vicarious experiences, verbal persuasion and physiological and emotional states. Individuals with higher self-efficacy—even in the face of difficulties—have been reported to show greater persistence in maintaining and achieving a job (Schunk, 1985), and be more effective and persistent in their efforts (Pajares & Schunk, 2002). Teachers' self-efficacy beliefs have been shown to positively influence their beliefs about teaching (Cho & Shim, 2013; Miller, Ramirez, & Murdock, 2017) and their thoughts and actions regarding using technology in the classroom (Abbitt, 2011). Burak (2019, p. 258) stated that '[s]elf-efficacy beliefs play a crucial role in motivation, well-being, and personal achievement'. Individuals with higher self-efficacy are reported to experience less fear and stress in the face of work-related problems, have higher cognitive performance, are more successful in cognitive activities, such as problem solving and remembering, use their cognitive and metacognitive strategies more frequently and effectively (Ozmentes, 2011). Hence, self-efficacy seems to have a substantial impact on the classroom instruction (Zee & Koomen, 2016). Teacher candidates' experiences they gain in teacher training institutions and they have during their student teaching are among the most powerful influences on the development of their self-efficacy beliefs (Hoy & Spero, 2005). Therefore, designing teacher training programs which focus on improving preservice teachers' self-efficacy beliefs may contribute to effective teaching and gaining insight into preservice teachers' self-efficacy beliefs may play a key role in doing so.

An individual's self-efficacy for creativity is creative self-efficacy. Abbott (2010, p. 12) defines CSE as 'a motivational state that is an individual's self-efficacy for expressing creativity' and 'an individual's belief in his or her own ability to express creative performance'. In a similar vein, Tierney and Farmer (2002) define creative self-efficacy as 'the belief one has the ability to produce creative outcomes' (p. 1138) and state that it is 'a key personal attribute for creativity in the workplace' (p. 1137). They argued that 'education experiences are also basic to the development of creative tendencies' (p. 1138) and creative self-efficacy beliefs 'influence employees' decisions to be creative in their work' (p. 1145). Correlation between creative self-efficacy and creative professional behaviour and performance have been widely reported for various occupations, including teaching (Alzoubi, Al Qudah, Albursan, Bakhiet & Abduljabbar, 2016; Carmeli & Schaubroeck, 2007; Choi, 2004 ; Chuang, Shiu & Cheng, 2010; Jaussi, Randel & Dionne, 2007; Liu & Wu, 2011; Mathisen & Bronnick, 2009; Phelan, 2001; Tierney & Farmer, 2002; Walumbwa, Christensen-Salem, Hsu & Misati, 2018). Particularly, it was reported that teachers' creative self-efficacy has an impact on their creative teaching performance (Cayirdag, 2017; Horng, Hong, ChanLin, Chang & Chu, 2005; Liu & Wang, 2019; Ucus & Acar, 2018). What is promising is that creative self-efficacy can be developed by training (Alzoubi et al., 2016; Mathisen & Bronnick, 2009) and 'increases in creative self-efficacy corresponded with increases in creative performance as well' (Tierney & Farmer, 2011, p. 277). Hence, gaining insight into creative self-efficacy may pave the way for developing better training programs for teachers and other professionals and those programs may help trainees develop and/or increase their creative self-efficacies. Stronger creative self-efficacy beliefs may contribute to increased creative professional performance. For teachers, increased creative performance (creative teaching) may lead to increased effectiveness in teaching and—especially, in the context of educational technology—more successful technology integration. Turkish version of CSES (Tierney & Farmer, 2002) may be useful for Turkish researchers to produce knowledge for gaining insight into creative self-efficacy.

2. Method

Current research was designed as a scale adaptation study consisting of two phases. First study was aimed at exploring the factor structure of the translated CSES while the second study was for confirming the factor structure. Throughout the study, Ethical Principles of Psychologists and Code of Conduct have been followed (American Psychological Association, 2002). Only consenting individuals participated in the research.

2.1. Participants

Four-hundred-eighty-nine preservice teachers who were enrolled in classroom teaching and preschool teaching programs of Akdeniz University Faculty of Education participated in both phases of the study (n = 489). Out of 489 preservice teachers, 235 (48.06%) participated in the first study (N_1 = 235) and 254 (51.94%) participated in the second study (N_2 = 254). Those who participated in the first study could not participate in the second one. Table 1 demonstrates demographic information of participants. Of all the participants, 260 (53.2%) were studying in preschool teaching and 132 (46.8%) were studying in classroom teaching program. Of 489 participants, 357 (73%) were female and 132 (27) were male. 122 (24.9%) were first, 112 (23.9%) were second, 122 (24.9%) were third and 133 (27.1%) were fourth graders. Participants were determined through convenience sampling from the teacher training institution where the researcher was a member of the faculty.

Table 1. Demographic information of participants

	Study 1			Study 2			Total		
	f **(%)**	$\bar{x}$	***s***	***f*** **(%)**	$\bar{x}$	***s***	***f*** **(%)**	$\bar{x}$	***s***
Age		21.32	2.75		21.17	2.24		21.25	2.48
Sex		0.33	0.47		0.22	0.041		0.26	0.44
Female	158(67.2)			199(78.3)			357(73.0)		
Male	77(32.8)			55(21.7)			132(27.0)		
Program									
ECE	118(50.2)			142(55.9)			260 (53.2)		
CT	117(49.8)			112(44.1)			229(46.8)		
Grade		2.60	1.13		2.49	1.14		2.54	1.13
1st	55(23.4)			67(26.4)			122(24.9)		
2nd	51(21.7)			61(24.0)			112(23.9)		
3rd	62(26.4)			60(23.6)			122(24.9)		
4th	67(28.5)			66(26.0)			133(27.1)		

ECE, and CT are abbreviations for Early Childhood Education (preschool teaching) and Classroom Teaching. f, $\bar{x}$, and s represent frequency, mean, and standard deviation, respectively. Numbers within parentheses are percentages with regard to study groups.

2.2. Data collection tools

Appendix A. ***2.2.1. Creative self-efficacy scale***

CSES was developed by Tierney and Farmer (2011, p. 1141) to measure 'employees' beliefs in their ability to be creative in their work'. The scale is a 7-point Likert-type scale consisting of three items (1 = Very strongly disagree, 7 = Very strongly agree). The score range is 3–21, and higher scores indicate stronger creative self-efficacy. Scale includes items such as 'I have confidence in my ability to solve problems creatively' (Sorunlari yaratici bir bicimde cozme yetenegime guveniyorum). Cronbach's α internal consistency estimate of the original scale was reported to be 0.83 for manufacturing employees and 0.87 for employees working in operations division of the same consumer products company. Finally, Tierney and Farmer (2011) reported that CSES has adequate convergent and discriminant validity according to the findings from confirmatory factor analysis (manufacturing, χ^2 = 41.69, df = 8, p < 0.001, CFI = 0.97, IFI = 0.97, RMSEA = 0.08; operations, χ^2 = 12.04, df = 8, p = 0.15, CFI = 0.99, IFI = 0.99, RMSEA = 0.07), χ^2 difference tests, and comparison of nomological networks between CSES and a scale on job self-efficacy.

Appendix B. ***2.2.2. Design self-efficacy scale***

Design self-efficacy scale (DSES) was developed by Beeftink, van Eerde, Rutte and Bertrand (2012, p. 73) to measure 'the extent to which a person feels confident to perform well on the design aspects of the job'. DSES was translated into Turkish by Atabek (2020a). The scale (Tasarim Ozyeterliligi Olcegi) is

a 5-point Likert-type scale and consists of eight items (1 = Strongly disagree, 5 = Strongly agree). Higher scores indicate stronger design self-efficacy. Scale includes items such as 'When I encounter a problem in a design, I can usually think of several solutions' (Bir tasarimda herhangi bir sorunla karsilastigimda, genellikle bircok cozum dusunebilirim) and 'I am confident that I could deal efficiently with unexpected setbacks during the design work' (Tasarim calismasi sirasinda ortaya cikabilecek beklenmedik tersliklerin ustesinden etkin bir bicimde gelebilecegim konusunda kendime guveniyorum). Cronbach's α internal consistency estimate of the scale was reported to be 0.877 (Atabek, 2020a).

2.3. Procedure

CSES, which is an English questionnaire, was translated into Turkish by the researcher. Two researchers who were expert in English language education translated the Turkish version back into English. A Turkish education expert, an English language education expert, an elementary education expert, two educational measurement and evaluation experts, and an educational technology expert reviewed both the original and translated scales. All disagreements were resolved by discussion until full-agreement was reached. A 3-item Turkish scale was constructed as a result of the expert review. However, response anchors were modified as a 5-point one (1 = Strongly disagree, 5 = Strongly agree). Afterwards, a paper-and-pencil instrument was arranged. The instrument comprised the Turkish scale and a demographics form. Required permissions were collected from institutional authorities. After collection, data were analysed by statistical measures.

2.4. Data analysis

First, responses from completed survey instruments were transferred to a computer. Statistical analyses were performed using IBM SPSS Statistics (IBM SPSS Statistics version 25) and IBM SPSS Amos (IBM SPSS Amos version 24) computer programs. An exploratory factor analysis (EFA) employing principal axis factoring (PAF) technique with direct oblimin rotation was conducted in order to investigate whether items of the Turkish scale were clustering into factors (Fabrigar, Wegener, MacCallum & Strahan, 1999; Tabachnick & Fidell, 2013; Tavsancil, 2002). For checking the reliability of the Turkish scale, Cronbach's α internal consistency estimate was computed. Finally, confirmatory factor analysis (CFA) with maximum likelihood estimation was performed on the data for determining whether or not the factor structure could be confirmed. In addition, Pearson's product-moment correlation coefficient, Spearman's rank-order correlation coefficient, *t*-test, and Kruskal–Wallis H test were used to analyse the data.

3. Findings

Since two different Cronbach's α estimates were reported for the original scale and only EFA could reveal whether the items clustered differently in Turkish culture, An EFA was conducted prior to CFA.

3.1. Findings from study 1

Initially, an EFA was performed on the collected data. All item-correlations were lower than 0.8, hence, assumption of multicollinearity was satisfied (Field, 2018). Kaiser–Meyer–Olkin sampling adequacy measure was 0.696, demonstrating that the sample size was adequate (Tavsancil, 2002). Bartlett's sphericity test was significant [$\chi^2(3) = 326.341$, $p = 0.000$] indicating that the correlation matrix among the items was not an identity matrix and that the assumption of sphericity was not violated (Field, 2018). Similar with the original scale, Turkish scale had a single factor with an Eigenvalue greater than 1. Scree plot (Figure 1) suggested that a single-factor model effectively represent the data, as well.

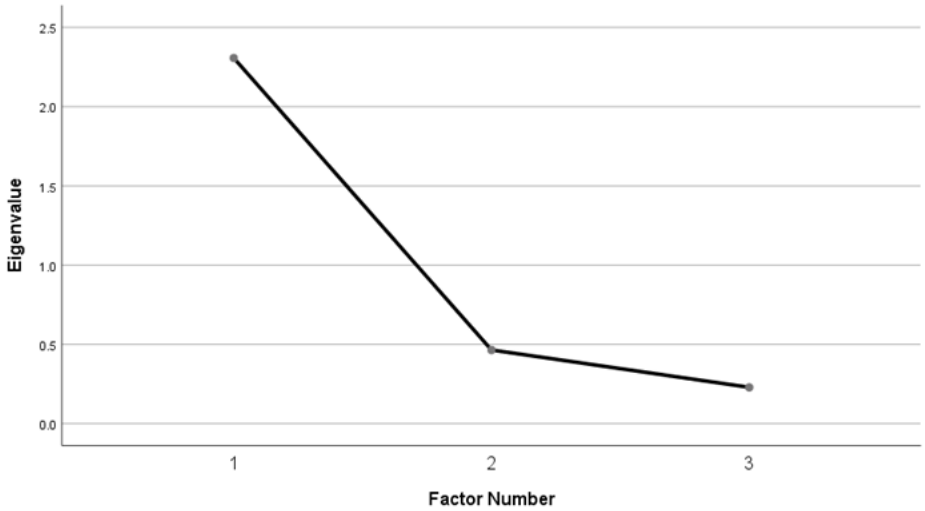

Figure 1. Scree plot of the Turkish scale

A single factor loaded by three items explained 76.887% of the variance (Table 2). Item 1, Item 2 and Item 3 loaded Factor 1 with 0.850, 0.904 and 0.676, respectively. Cronbach's α was calculated as 0.847 indicating that the scale was reliable (DeVellis, 2017; Field, 2018).

Table 2. Total variance explained and eigenvalues

Factor	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	2.307	76.887	76.887	1.997	66.557	66.557
2	0.465	15.485	92.372			
3	0.229	7.628	100.000			

Moreover, the means of the items ranged between 3.91 and 4.06 (Table 3). Communalities supported a single factor structure, as well. All items correlated with Factor 1 supporting convergent validity ($p < 0.01$). Means of inter-item correlations was 0.651. Mean of item-total score correlations was 0.875. Sum of scores ranged between 3 and 15 ($\bar{x}$ = 11.89, median = 12, s = 2.182).

Table 3. Item statistics from EFA

	Loadings	Communalities		Descriptives		Correlations			
	Factor 1	Initial	Extraction	$\bar{x}$	*s*	Item 1	Item 2	Item 3	Total Score
Item 1	0.850	0.608	0.723	4.06	0.835	1.000	0.769	0.573	0.890*
Item 2	0.904	0.635	0.817	3.91	0.807	0.769	1.000	0.612	0.902*
Item 3	0.676	0.400	0.457	3.91	0.850	0.573	0.612	1.000	0.835*

*$p < 0.01$.

Finally, a significant correlation between a global item (asking the participant to indicate her or his capacity in bring solutions to the problems by generating new and original ideas) and the total score of the scale supported the nomological validity of the scale (r = 0.576, n = 235, p = 0.000) (Churchill Jr, 1979; Edison & Geissler, 2003).

3.2. Findings from study 2

A CFA with maximum likelihood estimation was performed on the data for examining the validity and applicability of the hypothesized construct. However, with three items and one factor, degree of freedom for χ^2 analysis was zero. With zero degree of freedom, CFA could not be employed [$\chi^2(0) = 0$, p

= could not be calculated]. This model is described as just-identified and saturated. Wolf and Brown (2013) stated that 'goodness-of-fit evaluation does not apply because these solutions perfectly reproduce the input variance-covariance matrix' for the just-identified models. Khairani and Nordin (2011, p. 44) stated that 'it is unnecessary to assess the value of fit indices (TLI, CFI, GFI, RMSEA, etc.) because the data will fit the model perfectly'. A just-identified model produces a unique solution for all parameters (Byrne, 2001). In other words, CFA results revealed that there is no alternative model other than the tested model in which all three items load one factor. Hence, the data was assessed to fit the CSES model perfectly. Therefore, this 3-item adaptation of the original English scale was accepted as the Turkish version of CSES (Yaraticilik Ozyeterliligi Olcegi, YOO).

In order to further assess the validity of the scale, correlation of CSES score with DSES score was taken into consideration. Findings revealed that Turkish version of CSES was positively correlated with Turkish version of DSES (r = 0.586, n = 254, p = 0.000). Correlation between CSES and DSES supported the convergent validity of the newly translated CSES. Convergent validity is a subtype of construct validity. Trochim (2020) stated that 'measures of constructs that theoretically should not be related to each other are, in fact, observed to not be related to each other' (para. 2) and Pearson's product-moment correlation coefficient may be used to establish convergent validity.

3.3. Relationships with demographic variables

In order to contextualise the Turkish version of CSES, relationships between the new scale and demographic variables were investigated. Spearman's rank-order correlation coefficient calculation indicated that age had a positive but weak correlation with creative self-efficacy, p = 0.132, $p < 0.05$. On the other hand, t-tests revealed that creative self-efficacy did not differ according to sex [$t(252) = -0.995$, p = 0.321] or department [$t(252)$ = 0.734, p = 0464] of the participants. In a similar vein, Kruskal–Wallis H test showed that there was not a statistically significant difference in creative self-efficacy between grade levels, H(3) = 3.107, p = 0.375.

4. Discussion and conclusion

The purpose of the study was adapting CSES, which was developed by Tierney and Farmer (2011), into Turkish language for providing Turkish researchers with a research tool that may be used for determining teachers' and other professionals' self-efficacy for performing creatively. A Turkish education expert, three English language education experts, an elementary education expert, two educational measurement and evaluation experts and an educational technology expert participated in the translation, back-translation and review processes. EFA employing PAF with direct oblimin revealed that single-factor structure of the original scale was also valid for the translated scale in the Turkish sample. All item-correlations were lower than 0.8, hence, the assumption of multicollinearity was satisfied (Field, 2018). Kaiser–Meyer–Olkin sampling adequacy measure was 0.696, indicating that the sample size was adequate (Tavsancil, 2002). Bartlett's sphericity test was significant [$\chi^2(3) = 326.341$, p = 0.000] indicating that the sphericity assumption was not violated (Field, 2018). All three items of the translated scale did load on that single factor, as well. That single factor explained 76.887% of the variance. Cronbach's α estimate was calculated as 0.847 indicating that the scale was reliable (DeVellis, 2017; Field, 2018). Since the scale consisted of only three items and one factor, degree of freedom for χ^2 analysis was zero. Hence, with zero degree of freedom, CFA could not be employed [$\chi^2(0) = 0$, p = could not be calculated]. Since it was a just-identified saturated model, the data was assessed to fit the CSES model perfectly. Moreover, the correlation between creative self-efficacy and design self-efficacy supported the convergent validity of the Turkish version of CSES (r = 0.586, n = 254, p = 0.000). Statistical analyses revealed that adapted CSES had excellent validity and reliability. Thus, the findings of the current study suggested that present Turkish adaptation of CSES—Yaraticilik Ozyeterliligi Olcegi (YOO)—possesses adequate psychometric properties.

In the original study, Tierney and Farmer (2011, p. 1141) had conducted the research on full-time, employees from the manufacturing division of a large consumer products company. The fact that this study was carried out with a preservice teacher—and hence undergraduate student—sample and that the model was reproduced suggests that the CSES model is valid for university students and prospective teachers as well as non-student professional adults. However, the sample of this study consists of pre-service teachers who study in pre-school and classroom teaching programs. This raises the question of whether the scale also applies to in-service teachers. Another limitation of the current study is that the sample is not balanced in terms of the gender of the participants (27% were male). It should be noted, however, that the findings revealed that the levels of creative self-efficacy did not differ significantly with respect to the sex of the participants.

The results revealed that creative self-efficacy and age of the participants were not correlated. Creative self-efficacy did not differ according to department, sex or grade level of the participants, either. These results pointed out that YOO—Turkish adaptation of CSES—is not biased by department, age, sex or grade level of the participants and the scale functions as expected. On the other hand, the fact that creative self-efficacy did not have a meaningful relationship with the age, department or grade level of the participants showed that creative self-efficacy is a belief that requires more than physical development or progress from one class to another in an undergraduate program. It seems that an intervention designed to increase creative self-efficacy is need for increasing creative self-efficacy. It is also a remarkable finding that education provided in teacher training institutions, which includes courses focusing on creative expression and design, did not cause an increase in creativity self-efficacy levels of teacher candidates. However, it has been reported that creative self-efficacy can be improved through education (Alzoubi et al., 2016; Mathisen & Bronnick, 2009). Therefore, it is understood that, instructional programs should be developed with a special emphasis on creativity to help teachers and other professionals develop or increase their creative self-efficacy. Creativity can be taught and learned (Cropley et al., 2019) and individuals can be encouraged to act creatively (Sternberg, 2012). Therefore, the stability in creativity levels may be due to the instructional programs of teacher training institutions or the fact that faculty members in these institutions cannot allocate time or resources on inspiring students to increase their creativity. Therefore, in order to increase preservice teachers' creative self-efficacy levels, teacher training institutions should be provided with instructional programs which facilitates increasing of creative self-efficacy levels of students. At the same time, faculty members should be cognizant of creativity while doing their work.

Educators are designers and creators. Atabek (2020a, p. 10) reported that similar to their creative self-efficacy, pre-service teachers' design self-efficacy did not increase during the 4-year education they received in teacher training institutions. He stated that, as designers, educators 'need to have the competence to innovate and to help students make or use innovations'. Self-efficacy beliefs are also reported to be related to the use of educational technologies, a field where teachers should use their competence in design. (Atabek & Burak, 2019; Atabek, 2020b). The correlation between design self-efficacy and creative self-efficacy indicated that creative self-efficacy—as well as design self-efficacy—should be taken into consideration in order to ensure innovation in teaching and education. Teachers need to have the competence in teaching creatively and encouraging students to be creative. Tasdugen, Tekin, Kaya and Gunel (2020, p. 2) stated that as leaders, teachers 'should try to reveal the creativity of children to develop their abilities'. It should also be noted that creativity is among the 21st century skills students need to develop. (Demirci & Yavaslar, 2018). Moreover, creativity and design help professionals and students improve their personalities and life experiences, while helping them develop better sociocultural values (Miralay & Egitmen, 2019). Finally, creative teaching may contribute to effective teaching and successful technology integration, while at the same time, help teachers protect themselves and their jobs in the face of rising threat from artificial intelligence and automation. Being able to measure creative self-efficacy may contribute to gaining insight about teachers' self-beliefs about creativity and creative performance, which in turn, may be useful in the development of intervention strategies for improving preservice teachers' competence in teaching creatively. In this

context, Yaraticilik Ozyeterliligi Olcegi (YOO), which is the Turkish version of the CSES, can be used to measure individuals' creative self-efficacy and produce useful information about creative performance.

Notes

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