Translation of the MOOC Student Satisfaction Survey to Turkish: A Scale Adaptation and Validation Study*

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Abstract

Massive Open Online Courses (MOOCs) have been widely used all around the world to a great extent. Many of the MOOCs in different countries are in their native language, and there is a need to reliably assess the satisfaction levels of learners with various first languages since satisfaction stands as a critical aspect in identifying the reasons of dropouts and incontinence to MOOCs. To this end, this study aimed to translate Kumar and Kumar's (2020) "MOOC Student Satisfaction Survey" into Turkish. The researchers first translated the instrument items from English to Turkish before consulting a panel of three English experts and one Turkish expert on the suitability of the translation. A professional translator then backtranslated the scale to English, ensuring that no items were lost in translation. To establish content validity, changes were done in view of the professional feedback. The translated scale was subsequently administered to 150 former massive open online course participants for testing validity and reliability. Since this was a translation study, the same constructs of the original scale were retained, and a confirmatory factor analysis was conducted, the results of which indicated acceptable levels of validity with one item being discarded. As for the reliability values, Cronbach's alpha coefficient for the entire scale was .91, and the split-half reliability score was .87, indicating that the scale maintains good internal consistency. Therefore, it was determined that the scale's Turkish translation was valid and reliable.

Keywords: Distance Education, MOOCs, Online Learning, Scale Adaptation, Student Satisfaction

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INTRODUCTION

As in every part of human life, technological advances have also influenced the way education is theorised and practiced. Novel developments in technology inevitably lead to educational change. Distance education, however, is not a new concept in this regard as its roots can be traced as far back as to nineteenth century when correspondence education started in London (Mehlenbacher & Mehlenbacher, 2020). Evolving through the years, distance education has come to be an umbrella term encompassing such types of learning as distant, open, networked, flexible, distributed, and that which happens in connectivity as explained by Gunawardena and McIsaac (2008). Then, MOOCs have emerged in the last decade as a distance learning type in distance education. As the name suggests, MOOCs are *courses* conducted on an *online* learning environment, which is *open* to *massive* amounts of distant learner audiences freely or with a reasonable amount of fee.

Much research has been conducted with regards to MOOCs, their types, theorical grounds, and practical implications in the field. Furthermore, universities over the globe have been creating their distance learning platforms on which they provide a vast range of MOOCs that address both academical and skill-based purposes (Miller, 2015) in many different languages, and many online courses have been designed in their pertaining countries' first languages. Turkiye does not constitute an exception to this trend since many state universities have been founding their own online distance learning platforms within the scope of their continuing education centres, and many MOOC studies exist in the Turkish context as well. However, there is a scarcity of research with regards to learner needs, expectations, and satisfaction levels in MOOCs when the general literature is considered (Kumar & Kumar, 2020; Sallam et al., 2022). These are crucially vital factors to address and overcome learner related weaknesses of MOOCs, thereby maintaining student participation through the courses. Although there exists some research in the Turkish context with regards to student satisfaction in MOOCs (Göktaş, 2019; İşgör Şimşek & Turan, 2017; Şahin & Durdu, 2021), they use indirect instrumentation constructed with general learning statements to assess the satisfaction levels. Therefore, there is a need for a valid and reliable tool to measure the student satisfaction in MOOCs in the Turkish language. To this end, the current adaptation and validation study aims to address this gap by translating the MOOC Student Satisfaction Survey (MSSS) by Kumar & Kumar (2020), who developed it by adapting from a study by Bhattacharjee (2001) and the New World Kirkpatrick Model (see Kirkpatrick & Kirkpatrick, 2021).

Participation in MOOCs

Hunter (1976), in her study theorising effective instruction, proposes several elements listed as teaching with an aim, planning outcomes in line with the learner proficiency, observing learner development, and implementing learning principles. Learning principles include active participation, emerging from the intentional and conscient efforts of the teacher to foster direct student engagement (Pratton & Hales, 1986). Student participation is the involvement of learners in an effective learning process. Hence, the element of active participation and engagement in the educational processes holds a crucial value in the occurrence of learning. Student participation in learning is important in that active participation increases engagement and motivation, allows for more investment in the material, and fosters longer information retention thanks to active involvement (Felder & Silverman, 1988; Fredricks et al., 2004). However, in the literature, MOOCs are highly criticised for inadequate learner participation or complete lack thereof as a result of numerous factors inherent to the nature of MOOCs.

Although MOOCs are aimed to include a wide range of participants of diverse backgrounds with the purpose of increasing access to higher education, general demographics of distant learners in such courses constitute young adults from usually developed countries, who are educated well with high levels of formal instruction (Christensen et al., 2014). As for learners with different demographical features, reasons for not enrolling in a MOOC vary. Most prevalently, they include being unfamiliar with a distant online learning environment, having concerns about not being able to maintain learning, and feeling that MOOCs lack interactional communication and a sense of belonging

among their stakeholders (Aldowah et al., 2019; Ma & Lee, 2018; Zheng et al., 2015). If individuals have no prior experience with regards to such distance educational settings, they might refrain from participating in MOOCs, thereby opting for traditional classrooms as Kumar and Kumar (2020) explain. Many learners are accustomed to receiving teacher-directed instruction and thus learning in others' guidance in traditional education, so some individuals may face the feeling of getting lost in MOOCs.

Similar reasons apply for those who are enrolled in but drop out of MOOCs instead of completing them. Motivational factors and autonomy are among the primary causes of dropout rates (Aldowah et al., 2019). Other reasons for withdrawal include but are not limited to losing interest in the course, shortage of adequate communication and proper course design (Kumar & Kumar, 2020), having a high workload, lacking time, and lacking a pushing factor to complete the course (Zheng et al., 2015). Therefore, the main reasons for high dropout rates in MOOCs are lack of motivation, unclear planning, disengagement, and inadequate support.

MOOC Satisfaction

Initially, the term satisfaction should be established in the study's context. By satisfaction, that of learners is addressed. Student satisfaction serves as a measure of how students perceive their learning experiences, making it a significant factor in determining the impact on psychological factors such as motivation levels (Astin, 1993; Hew et al., 2020). Moreover, in distance learning, student satisfaction is intricately linked to their perception of the instruction quality, emphasizing the significance of taking student satisfaction into account when developing and implementing distance education programs (Chiu et al., 2005; Elia et al., 2019; Wu et al., 2010). In addition to this, student participation and student satisfaction levels are in a strong relationship. Studies have shown that those who are actively engaged in learning are more likely to be satisfied with their educational experiences (Astin, 1984, 1993). Consequently, when designing an efficient MOOC or assessing one that already exists, student satisfaction should be a central aspect to evaluate both for improving the quality of education and to overcome the most known weakness of MOOCs, high dropout rates. If learners of a MOOC are viewed as consumers of the education it provides in line with Thomas and Galambos' (2004) notion, then there is nothing more valuable for an educational institution that offers the MOOC than satisfied customers. A satisfied MOOC learner would presumably neither withdraw from the course nor would exhibit inactivity. Furthermore, satisfied MOOC student will attract more students to the course, boosting the financial gain and prestige of the institution (Hew et al., 2020).

Student satisfaction in MOOCs is affected by a range of factors that can be grouped into two categorisations as course-related and learner-related. Course-related factors include the planning, design, and implementation of the course, with key elements being the learners' perception of the practicality, user-friendliness, and flexibility of the course (Hew et al., 2020; Joo et al., 2018), which when well established, can positively impact satisfaction by promoting effective interactions between the learner and the course content (Alraimi et al., 2015; Gameel, 2017; Shrader et al, 2016). On the other hand, learner-related factors refer to the unique attributes of the individuals participating in the course, which include but are not limited to motivational aspects, learner autonomy, determination, and overall engagement in the course (Kumar & Kumar, 2020; Joo et al., 2018; So & Brush, 2008). Both categorisations of affecting factors are interrelated since if a MOOC is well designed, then it would increment positive learning experiences. Understanding the factors that influence student satisfaction in MOOCs is important for educators and course designers to improve the overall experience and ensure learners' satisfaction. Indeed, there is an emerging research trend on student satisfaction to evaluate MOOCs and identify areas for improvement.

METHOD

Research Design

Following a quantitative approach in research, the current study is a survey research design that aims to translate the MSSS by Kumar and Kumar (2020) into the Turkish language. In such a design, the researchers measure the attitudes, behaviours, beliefs, or opinions of a population with the use of a survey or a questionnaire (Creswell, 2002). Additionally, a typical scale translation study involves rigorous adaptational procedures, gathering data from a large sampling group, and statistical analyses for the adapted scale's validation (e.g., Demirci & Akcaalan, 2022; Mendi & Mendi, 2015).

Instrument

In this study, the data collection instrument is a Turkish translation of the survey developed by Kumar and Kumar (2020) in their research, which measures student satisfaction in MOOC learning environments with 20 items in five constructs on a five-point Likert-type scale ranging from 1 to 5. Course Content (CC), Course Delivery (CD), Course Assessment (CA), Course Support (CS), and Overall Satisfaction (OS) are the constructs involved. Table 1 contains detailed information about the original scale's constructs, including their items, AVE (average variance extracted) values for construct validity, composite reliability (CR) values, and internal consistency scores. As can be seen, the subscales have a high level of reliability and validity. Nevertheless, when it comes to the overall reliability of the MSSS, Kumar and Kumar appear to have not provided any internal consistency score in their analysis, which is a missing component that is rectified within the adaption phase of the scale.

Table 1 Reliability and Validity Scores of the MSSS

Construct	Items	AVE	CR	α
Course Content	CC1	.65	.92	.89
	CC2			
	CC3			
	CC4			
	CC5			
	CC6			
	CC7			
	CC8			
Course Delivery	CD1	.73	.92	.88
	CD2			
	CD3			
	CD4			
Course Assessment	CA1	.60	.86	.78
	CA2			
	CA3			
	CA4			
Course Support	CS1	.72	.88	.80
	CS2			
	CS3			
Overall Satisfaction	OS1	.68	.86	.76
	OS2			
	OS3			

Participants and Setting

The setting of the adaptation procedure is a state university in Turkiye and its online continuing education centre. The study's population consists of learners who have taken a MOOC in the university's continuing education centre. Sampling of the population is done randomly. Since this is a scale development design, it has several stages, detailed in the adaptation procedure, with different participant groups, composing of the Faculty of Education's students in addition to other MOOC participants.

In a study aimed at developing or adapting a scale, the suggested number of participants to be sampled varies in the literature. Tay and Jebb (2017), for instance, propose a number of 200 participants as a rule of thumb, while Comrey and Lee (2013) provide a five-point scale for sampling size, ranging from 100 participants considered inadequate to 1000 or more considered excellent. Given that the present adaptation study was partly retrospective in nature in the sense that it invited former MOOC learners to participate and share their course satisfaction, it was expected that the sample size would be limited. Therefore, the threshold of 200 participants set by the aforementioned authors could not be met. However, other researchers suggest that a ratio of at least five participants per scale item is acceptable, provided that the sample size reaches a minimum number of 100 participants (Ding et al., 1995; Gorsuch, 1983; Tabachnick & Fidell, 1996). Accordingly, a total of 160 participants took part in this study, corresponding to an average of 8 participants per scale item. After the removal of extreme outliers to ensure normal distribution, the number of participants decreased to 150 (n_{male} = 29, n_{female} = 121), or an average of 7.5 per item. Participant ages ranged from 19 to 50, averaging to 29 years old. Further information regarding these participants can be found in Table 2.

Table 2 Participant Demographics by Profession and Level of Education

		Department of Study or Graduation					
		ELT Department	Preschool Education	Child Development	Other Dpts. of FoE	Other Language Dpts.	Other Fields of Study
Profession	Student	60		1		2	2
	Unemployed Graduate	4	1	3		3	3
	English Language Teacher	25		4	1	9	
	Other Branch Teachers	2	10	7	3	2	
	Faculty Member	2	1				
	Other Professions	2	1				2
Education	Associate degree			2		2	3
	Undergraduate degree	83	11	7	2	12	4
	Graduate degree	12	2	6	2	2	

Note. Dpts. = Departments, FoE = Faculty of Education.

Translation Procedure

Initially, the creators of the original satisfaction survey were contacted to obtain their approval for the scale's translation into Turkish. Prof. Dr. Parul Kumar, who is listed as the corresponding author of Kumar and Kumar's (2020) study, approved of the Turkish translation and gave the researchers access to the original scale items. The translation process followed.

Figure 1 depicts the full process of translating and adapting the MOOC Student Satisfaction Survey. The procedure was carried out in five major steps, the first of which was the researcher's tentative translation of the original scale items into Turkish. Each item was translated from English to Turkish, with any necessary modifications or additions. Because of linguistic differences between the source and target languages, some items could not be translated verbatim, so adaptations construing the same meaning were made if required.

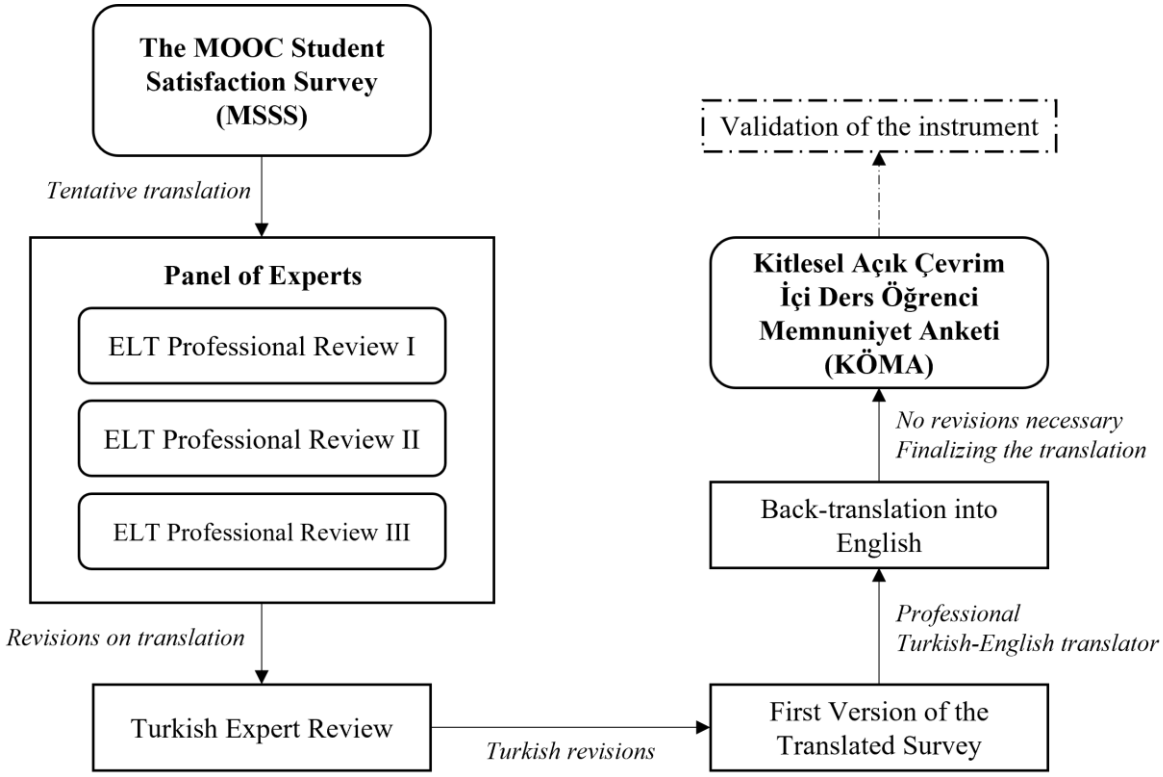

Figure 1 The Translation Procedure of the MSSS

The translated items were then revised in light of the panel's feedback and approved as sufficient by the panel thereafter. Thirdly, a faculty member from the Turkish Language Teaching department was given this revised version of the survey to review for linguistic comprehensibility and clarity. After the translated items had been adjusted in accordance with the Turkish professional's advice, the survey was prepared for backtranslation into English to make sure no terminology or content had been lost in the translation. This was done to check whether the original version and the backtranslation were similar as in similar studies (Mendi & Mendi, 2015; Tuğsal, 2020), which is one of the steps in ensuring the quality of the translated research instruments as instructed by Wild et al. (2005). The back translation was carried out by an expert Turkish-English translator who had no prior knowledge of the original scale items. Table 4 compares some of the back translations with the original items. As can be seen, no significant difference in meaning is present when the items and their corresponding backtranslated versions are compared although some linguistic structures appear to have changed during the process of backtranslation.

Table 3 Some Problematic Points in Translation as Reviewed by the Panel of ELT Experts

Item	Original Items	Translated Items[a]	*M*[b]
CC2	I found the course modules adequate.	Ders modüllerini yeterli buldum.	2.67
CC3	I found the course modules easy to understand and follow.	Ders modüllerinin takibi kolay ve anlaşılırdı.	2.67
CC4	I found the multimedia materials (videos) used to be engaging.	Kullanılan multimedya materyallerini (videoları) etkileşimli buldum.	1.67
CC6	Examples, illustrations, or real-world cases were used effectively to explain things.	Olayları açıklamak için örnekler, görseller ve gerçek olay durumları etkili bir şekilde kullanılmıştı.	2.33
CD2	I did not have problems with course delivery.	Dersin verilişinde bir sorun yaşamadım.	1.67
CD3	I was able to relate each of the learning objectives to the learning I achieved.	Öğrenme hedeflerinin her birini elde ettiğim öğrenmeyle ilişkilendirebildim.	1.67
CE2	I felt the deadlines were fair.	Verilen görevler için belirlenen son tarihler makuldü.	2.33
CE3	Assignments demand full attention and are quite rigorous.	Verilen görevler tam dikkat gerektiriyor ve oldukça özenli.	2.33
CE4	Quizzes are little tricky.	Sınavlar biraz zor.	2.00
CS1	I was able to navigate the course site easily.	Ders sitesinde kolayca gezinebildim.	2.67

CS3	Interacting in the forums helped me to clarify things I did not understand.	Forumlarda (yorumlar, eğiticiyle iletişim, vb.) etkileşimde bulunmak anlamadığım şeyleri netleştirmemde yardımcı oldu.	2.67
OS3	I am encouraged to enrol in another course in the future.	Gelecekte başka bir kitlesel açık çevrimiçi derse kaydolmayı düşünüyorum.	2.33

[a]Problematic points were underlined. [b]Mean scores of total relevance (min = 1, max = 3).

Table 4 Sample of Original Items and Their Backtranslations to English from Turkish

Item	Original Items	Items Backtranslated to English from Turkish
CC2	I found the course modules adequate.	I found the units adequate.
CC4	I found the multimedia materials (videos) used to be engaging.	I found the used multimedia materials (videos) interesting.
CC6	Examples, illustrations, or real-world cases were used effectively to explain things.	Examples, visuals, and real-life situations were effectively used to explain the content.
CD1	I was comfortable with the pace of the program.	I was satisfied with the program's speed.
CD3	I was able to relate each of the learning objectives to the learning I achieved.	I was able to associate each learning objective to what I learned.
CE2	I felt the deadlines were fair.	The deadlines were appropriate.
CE4	Quizzes are little tricky.	The exams were a bit challenging.
CS1	I was able to navigate the course site easily.	I was able to easily navigate the website where the course was taught.
CS3	Interacting in the forums helped me to clarify things I did not understand.	Interacting on forums (via comments, having contact with the educator, etc.) helped me clarify points where I didn't understand.
OS3	I am encouraged to enrol in another course in the future.	I would be willing to enrol in another massive open online course in the future.

Data Collection and Analysis

The data collection procedure began with addressing ethical concerns. Due to the inclusion of a group of preservice teachers in the current scale adaptation and validation study, permission was initially sought from the Faculty of Education. Subsequently, an Ethical Board Approval was granted by the university at which the study was conducted. Next, former participants of a MOOC were invited to participate in the study via email through the continuing education centre's panel. The email provided a detailed explanation of the study's aims, outcomes, and significance, along with a link to the adapted questionnaire's online version on Google Forms. Data was collected from respondents who voluntarily participated in the study via email.

The handling and analysis of data gathered were done using the software packages, IBM SPSS Statistics (v26.0) and IBM SPSS AMOS (v22.0). The former was used with two purposes, which are to descriptively present the means of responses and to calculate the internal consistency values of the adapted Turkish version of the scale. The latter program, AMOS was used to conduct confirmatory factor analysis (CFA), a statistical technique used with the purpose of testing and confirming the underlying factor structure of a set of survey items (Hair et al., 2010). The factors of a constructed survey can either be assumed or explored through the use of a statistical technique called exploratory factor analysis (EFA). As its name implies, EFA is used when the researcher has no prior knowledge of the underlying factors that comprise the survey and needs to identify and explain them (Orçan, 2018). Typically, prior to conducting a CFA, EFA is used to determine factor loadings and structures that will be later labelled by the researcher. However, if the factors of the developed instrument are strongly assumed or a translation or adaptation of the instrument is being performed, the step of EFA can be skipped, and CFA can be directly utilized (Orçan, 2018).

With the conduction of CFA, the aim was to measure the extent to which the translated scale showed satisfactory level of validity. Various statistical values were used as determinants of validation, including the ratio of chi-square to the degree of freedom (χ^2/df), root mean square error of approximation (RMSEA), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), comparative fit index (CFI), normed fit index (NFI), and non-normed fit index (NNFI), as commonly practiced in the literature (Klein et al., 2005; Kline, 2011).

Moreover, the panel of experts was consulted again to identify the content validity index (CVI) of the adapted scale in line with Lynn's (1986) instructions. Lynn suggests that within a group of experts, a single item CVI of at least .80 and a mean CVI of .90 should be achieved for satisfactory content validity. Since the initial panel comprised only 3 experts, 2 additional faculty members were invited to rate the items on a four-point scale (1 = irrelevant, 2 = somewhat relevant, 3 = relevant, 4 = very relevant), as per Lynn's guidelines.

RESULTS

This section of the study presents the results of the abovementioned statistical analyses performed on the data collected using the Turkish version of the adapted scale. Prior to conducting these analyses, it was necessary to assume normal distribution among the variables. Table 5 shows that this assumption was met, as evidenced by the skewness values falling within the range of ±2 and the kurtosis values falling within the range of ±7, as proposed by Hair et al. (2010) and Byrne (2010).

Table 5 Descriptive Statistics of the Turkish MSSS and Normality Distributions of the Data (N = 150)

				Skewness		Kurtosis	
Construct	Item	*M*	*SD*	Value	SE	Value	SE
Course Content	CC1	4.78	0.43	-1.62	0.20	1.33	0.39
	CC2	4.65	0.57	-1.37	0.20	0.93	0.39
	CC3	4.72	0.48	-1.36	0.20	0.70	0.39
	CC4	4.61	0.65	-1.86	0.20	3.79	0.39
	CC5	4.75	0.47	-1.54	0.20	1.33	0.39
	CC6	4.66	0.55	-1.39	0.20	0.98	0.39
Course Delivery	CD1	4.33	0.89	-1.55	0.20	2.39	0.39
	CD2	4.69	0.54	-1.84	0.20	3.93	0.39
	CD3	4.65	0.52	-1.05	0.20	-0.02	0.39
	CD4	4.65	0.56	-1.55	0.20	2.76	0.39
Course Evaluation	CE1	4.44	0.66	-0.77	0.20	-0.48	0.39
	CE2	4.63	0.60	-1.56	0.20	2.33	0.39
	CE3	4.54	0.65	-1.40	0.20	2.01	0.39
	CE4	3.04	1.27	0.04	0.20	-1.03	0.39
Course Support	CS1	4.61	0.63	-1.69	0.20	3.03	0.39
	CS3	4.57	0.63	-1.16	0.20	0.26	0.39
	CS3	4.41	0.80	-1.13	0.20	0.23	0.39
Overall Satisfaction	OS1	4.69	0.51	-1.59	0.20	3.60	0.39
	OS2	4.71	0.49	-1.27	0.20	0.43	0.39
	OS3	4.58	0.64	-1.41	0.20	1.52	0.39

Content Validity

Firstly, content validity was to be ensured. To this end, Lynn's (1986) instructions were adhered, and a panel of 5 professionals were asked to rate the relevancy of each scale item on a four-point scale, ranging from irrelevant to very relevant. For each item, the number of experts who rate the item as either 3 or 4 was divided by the total number of experts, and the average CVI for the whole scale was also calculated by summing the proportion of experts who rate each item as 3 or 4 and dividing by the total number of items. As in Table 6, some items were found to have an unsatisfactory level of content validity (CVI < .80) according to Lynn (1986).

Table 6 Content Validity Indices Provided by Five Experts

Construct	Item	E1	E2	E3	E4	E5	Experts in Agreement	CVI
Course Content	CC1	+	+	+	+	+	5/5	1.00
	CC2	+	+	+	+	+	5/5	1.00
	CC3	-	-	-	+	+	2/5	.40*
	CC4	+	+	-	+	+	4/5	.80
	CC5	+	+	-	+	+	4/5	.80
	CC6	+	+	+	+	+	5/5	1.00
Course Delivery	CD1	+	+	+	+	+	5/5	1.00
	CD2	+	+	+	+	+	5/5	1.00
	CD3	+	+	+	+	+	5/5	1.00
	CD4	+	+	+	+	+	5/5	1.00
Course Evaluation	CE1	+	+	+	+	+	5/5	1.00
	CE2	+	-	-	+	+	3/5	.60*
	CE3	+	-	-	-	-	1/5	.20*
	CE4	+	-	+	+	+	4/5	.80
Course Support	CS1	+	+	+	+	+	5/5	1.00
	CS3	+	+	+	+	+	5/5	1.00
	CS3	+	+	+	+	+	5/5	1.00
Overall Satisfaction	OS1	+	+	+	+	+	5/5	1.00
	OS2	+	+	+	+	+	5/5	1.00
	OS3	+	+	-	+	+	4/5	.80

*Items were revised with feedback received from the experts as they indicated low CVI.

The items of CC3, CE2, and CE3 demonstrated unacceptable CVI levels, so they were revised in line with the panellists' feedback and resent to them for evaluation. They rated the items again on a four-point scale. Accordingly, this time 5 experts were in agreement for CC3's content validity (CVI = 1.00), whereas for CE2, 4 experts were in agreement (CVI = .80), and for CE3, 4 experts were in agreement (CVI = .80). As for the overall CVI, the translated instrument had an index value of .90. So, the content validity of the MSSS' Turkish version was ensured.

Construct Validity

Secondly, in order to determine the construct validity of the Turkish MSSS, a CFA was run. Since the item CE4 indicated the poorest level of standardized loading estimate with a value of .05 lower than the threshold of .50 according to Hair et al. (2010), it was discarded, and the CFA was rerun with the new structure. This time, CE2 showed poor level of standardized loading estimate, as shown in Figure 2, but the item was just below the threshold and was essential item to the questionnaire, so it was not discarded.

The results of the CFA demonstrate that the translated instrument has acceptable model fit indices. Firstly, the ratio of chi-square to the degree of freedom ($\chi 2/df$), which measures the goodness of fit of a statistical model, was calculated to be 1.74 (≤ 3), indicating a good fit with the $\chi 2$ value of 234.86, $p < .001$ (Kline, 2011). Secondly, while the GFI (= .86) and AGFI (= .81) values fall below the .90 threshold, they are still considered acceptable as they satisfy the criterion proposed by Baumgartner and Homburg (1995), as well as Doll et al. (1994), who consider values above .80 as acceptable, and the values of standardized root mean square (SRMR = .053) and root mean square (RMR = .021) are indicative of good fit scores as well. Thirdly, the baseline comparisons reveal that the values of NFI (= .84), NNFI (= .90) and CFI (= .92) also indicate acceptable fit levels. Finally, the RMSEA (= .07) value also indicates an acceptable fit as it falls within the range of .05 to .08 suggested by MacCallum et al. (1996).

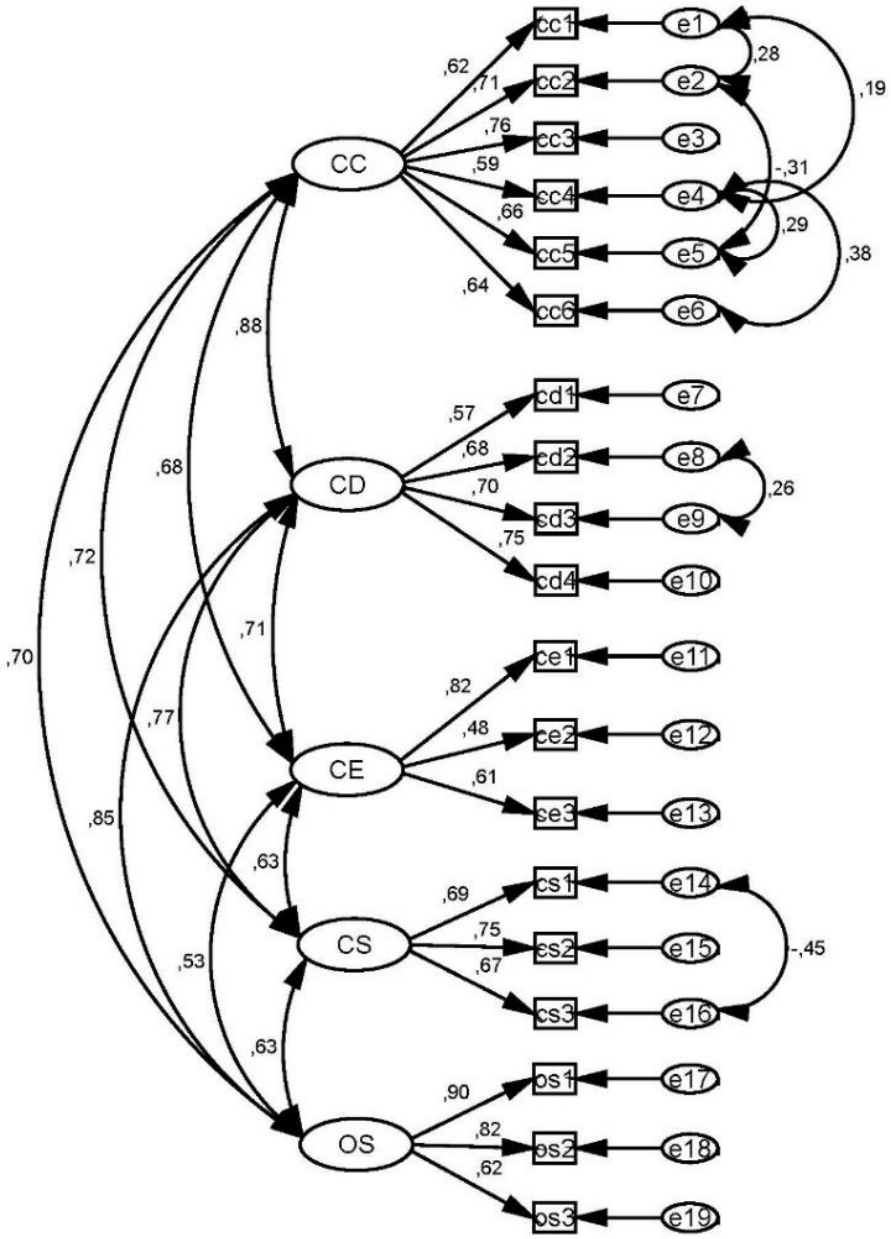

Figure 2 Structural Model for CFA

Convergent validity is a type of construct validity that measures the degree to which different methods of measuring the same construct are correlated. Simply put, it refers to the extent to which two or more measures of the same construct produce similar results (DeVellis, 2017). Convergent validity can be established by examining the factor loadings, AVE, and CR values of a measurement instrument (Fornell & Larcker, 1981). In this regard, Table 7 presents the factor loadings, AVE, and CR values for each subscale of the translated item. Accordingly, convergent validity is established since Fornell and Larcker (1981) suggest that if the CR value of a factor is .60 or higher, AVE values above .40 are satisfactory.

Table 7 Parameter Estimates of the Turkish MSSS

	Standardized Factor Loading				
Item	Factor CC	Factor CD	Factor CE	Factor CS	Factor OS
CC1	.62				
CC2	.71				
CC3	.76				
CC4	.59				
CC5	.66				
CC6	.64				
CD1		.57			
CD2		.68			
CD3		.70			
CD4		.75			
CE1			.82		
CE2			.48		
CE3			.61		
CS1				.69	
CS2				.75	
CS3				.67	
OS1					.90
OS2					.82
OS3					.62
AVE (%)	.45	.46	.43	.50	.62
CR	.83	.77	.68	.75	.83

As for discriminant validity, which is the second type of construct validity that measures the degree to which different constructs are distinct from each other, it can be established by demonstrating that the measures of the different constructs are not highly correlated (DeVellis, 2017). Although some authors suggest that the factor correlation values should not exceed the threshold of .85 (e.g., Kline, 2011), some others propose a threshold of .90 (e.g., Teo et al., 2008). As shown in Table 8, the correlational values of the Turkish MSSS fall within the range of .53 to .88, which, therefore, indicate discriminant validity according to Teo et al. (2008).

Table 8 Discriminant Validity of the Turkish MSSS

	CS	CC	CD	CE	OS	AVE (%)
CS	0.70					.43
CC	0.72	0.67				.45
CD	0.77	0.88	0.68			.46
CE	0.63	0.69	0.71	0.65		.50
OS	0.63	0.70	0.85	0.53	0.80	.62

Note. Bold-type numerical data represents the squared value of AVE. The correlation between the dimensions is represented off diagonally.

Reliability

Lastly, the reliability coefficients of the translated MSSS were calculated. To do that firstly, Cronbach's alpha measurement was taken into consideration. Overall reliability of the instrument was $\alpha = .91$, and internal consistency values ranged from .67 to .84, which indicate acceptable levels of reliability according to Konting et al. (2009), who suggest that $\alpha < .60$ is unreliable. The subscale of CC had $\alpha = .83$ with 6 items; the subscale of CS had $\alpha = .67$ with 3 items; the subscale of CD had $\alpha = .75$ with 4 items; the subscale of CE had $\alpha = .67$ with 3 items; the subscale of OS had $\alpha = .80$ with 3 items.

Guttman split-half coefficients were also measured for the internal consistency of the translated instrument. Overall split-half coefficient was .87, and the coefficient values of the constructs ranged from .59 to .75, mostly exhibiting acceptable levels of reliability again, according to Konting et al. (2009). The only construct under the threshold of .60 was CS, but it should be noted that since it had 3 items, the halves split while running the measurement may not have been balanced due to low

number of items. The other constructs' split-half coefficients were as follows: CC had .74; CD had .75; CE had .62; OS had .68.

A summary of all the validation statistics for the Turkish translated version of the MOOC Satisfaction Survey can be found in Table 9. The scale is available as Appendix at the end of the article.

Table 9 Summary of Turkish MOOC Satisfaction Survey's Validation

		Validity and reliability values				
Construct	Item	CVI	CR	AVE (%)	α	Split-half reliability
Course Content	CC1	1.00	.83	.45	.84	.74
	CC2	1.00				
	CC3	1.00				
	CC4	.80				
	CC5	.80				
	CC6	1.00				
Course Delivery	CD1	1.00	.77	.46	.75	.75
	CD2	1.00				
	CD3	1.00				
	CD4	1.00				
Course Evaluation	CE1	1.00	.68	.43	.67	.62
	CE2	.80				
	CE3	.80				
Course Support	CS1	1.00	.75	.50	.67	.59
	CS2	1.00				
	CS3	1.00				
Overall Satisfaction	OS1	1.00	.83	.62	.80	.68
	OS2	1.00				
	OS3	.80				
Entire instrument's scores		.95*	–	–	.91	.87

*Overall CVI increased since the item CE4 was discarded.

DISCUSSION AND CONCLUSION

The aim of the present adaptation study was to translate the "MOOC Student Satisfaction Survey", developed originally in English by Kumar and Kumar (2020), into the Turkish language. The scale's validation was done in two aspects, the first of which was ensuring content validity during and after the translation. With a panel of experts, the adapted scale went through rigorous rounds of revision. In the final version of the instrument, individual CVI values of each scale item ranged from .80 to 1.00 with an overall CVI value of .95, indicating high content validity according to Lynn (1986). Secondly, construct validity was to be ensured, so confirmatory factor analysis was conducted with the purpose of measuring the model fit indices of the adapted scale. The item CE4 was discarded due to low factor loading in the structural model. With the structural model for CFA, the following fit indices were measured: $\chi 2 = 234.86$ ($p < .001$), $\chi 2/df = 1.74$, RMSEA = .070, SRMR = .053, GFI = .86, AGFI = .81, CFI = .92, NFI = .84, and NNFI = .90. Therefore, the translated version of the scale acceptable fit indices (Byrne, 2010). On the other hand, AVEs of the subscales were above the threshold of .40 with CR values over .60, which according to Fornell and Larcker (1981), are acceptable scores for validity. In this regard, the Turkish MSSS was revealed to have both content and construct validity.

Cronbach's alpha coefficients and split-half reliability scores were used to ensure the internal consistency of the translated instrument. Cronbach's alpha for the total scale was .91, while the coefficients for the subscales ranged from .67 to .84, showing satisfactory levels of reliability. However, as compared to the original instrument developed by Kumar and Kumar (2020), the internal consistency values determined with Cronbach's alpha coefficients were found to be lower in the Turkish version, which could be attributed to the small sample size in this study as well as the fact that the translated items in the Turkish version were not run through an EFA for the sake of preserving the original scale constructs, leading to lower reliability scores in the Turkish context. In terms of split-half reliability, the values of which are absent for the original scale, the overall instrument was highly

reliable, with a value of .87, and the subscales likewise demonstrated, though barely, adequate levels of split-half reliability (Groth-Marnat & Wright, 2016).

In conclusion, after a thorough procedure of translation, adaptation, and validation of the original scale to the Turkish language, which followed the structure of similar scale adaptation studies (İskifoğlu & Ağazade, 2013; Mendi & Mendi, 2015; Tuğsal, 2020) in line with the steps of scale development and standardisation laid down by Kyriazos and Stalikas (2018), the translated version of the MOOC Student Satisfaction Survey was proven to be a valid and reliable instrument for measuring student satisfaction in a massive open online learning environment in the Turkish setting. The instrument was not translated verbatim for every item since some points needed to be adjusted to the study's context, where either a comprehensive explanation in parentheses was given to describe a term or a phase, or a complete rephrasing was done to offer the exact meaning in Turkish. The general structure of the instrument was kept, with only one item being removed due to poor factor loading under the construct to which it originally belonged in the English instrument. Although running an exploratory factor analysis prior to the CFA could have saved the item CE4 by fitting it under a more appropriate factor, the translated version would not be faithful to the original in its overall structure and subscales, so the researchers decided to remove the item instead, which is a practice that can be followed in scale development and/or adaptation studies according to DeVellis (2017) if an item exhibits unacceptable fit during the analyses.

The assessment of student satisfaction in the context MOOCs carries significant educational implications. Firstly, it provides a valuable avenue for course improvement by utilizing participant feedback to identify strengths and weaknesses, enabling to refine content, assessments, and delivery methods, thereby enhancing the overall learning experience to align with the preferences and needs of learners (Kara et al., 2021; Lu et al., 2019; Moore, 2005). Secondly, student satisfaction plays a crucial role in driving engagement and retention; a positive MOOC experience fosters motivation and commitment, increasing the likelihood of course completion. By pinpointing elements that resonate positively, such as interactive features and effective communication, educators can create an environment that encourages active participation and long-lasting impact (de Barba et al., 2016; Ustaoğlu & Kukul, 2022). Analysing satisfaction data also enables evidence-based decision-making, allowing instructors to identify effective pedagogical approaches and implement targeted strategies for enhancing learning. Lastly, insights into diverse preferences guide efforts toward inclusivity, facilitating course adaptations catering to a wide range of learners (Kara et al., 2021; Joo et al., 2018).

With the growing use of MOOCs over the globe, especially sparking interest in the domain of education after the COVID-19 period, the original MSSS by Kumar and Kumar (2020) stands a promising instrument to assess the levels of satisfaction among a variety of MOOC learners that are from different contexts other than those in which the medium of instruction is the English language. Therefore, the current study holds importance as the first sample of disseminating the scale to other languages, and the adaptation of the scale to other languages are strongly recommended in this regard. Lastly, it is hoped that gradually more studies will be undertaken in Turkiye as well, and this instrument will be a beneficiary tool in providing insights into the satisfaction levels of MOOC learners, thereby showing the effectiveness of a MOOC from various aspects to be considered by course designers and instructors.

LIMITATIONS AND RECOMMENDATIONS

The present scale translation study is subject to several limitations that have exerted influence on the overall findings. Firstly, it should be noted that the study's scope was delimited by a constrained number of respondents. Consequently, the authors are cautious in asserting full validation and reliability of the instrument. Further investigation is thus warranted, involving the administration of the Turkish scale to a broader cohort of MOOC learners within analogous contexts, which would be crucial to corroborate the validation scores derived from the current study.

Secondly, although the adaptation of the scale to the Turkish context exhibited robustness, there remains a salient need to delve into the cultural factors that might exert an impact on levels of satisfaction. In this regard, it is recommended that a cross-cultural validation study be undertaken for the adapted scale. Such an endeavour would entail an assessment of the scale's performance across diverse cultural settings, contributing valuable insights into its cross-cultural validity.

A third limitation pertains to the methodology employed for establishing construct validity. Specifically, the current study opted solely for CFA, bypassing the more preliminary step of EFA. This choice was informed by considerations such as the modest sample size and the desire to maintain fidelity to the original scale structure. However, it is prudent to acknowledge that the nuances introduced during the translation process due to contextual disparities may warrant the integration of EFA. This could effectively facilitate a more comprehensive exploration of the latent factor structure, yielding a heightened comprehension of the alignment between the dimensions of the scale and the Turkish context as well as improving the internal consistency scores obtained here.

Lastly, given the dynamic and open nature of MOOC learning environments, characterized by learners' sustained engagement with activities and lectures over an extended duration of time, it is proposed that longitudinal investigations be conducted, the purpose of which would be to discern potential shifts in learner satisfaction over time. Such a longitudinal lens holds the promise of furnishing additional insights into the evolving patterns of student contentment.

In summary, the current study's findings, while informative, are circumscribed by certain constraints. A more expansive investigation involving a wider respondent base, cross-cultural validation, and a nuanced methodological approach could substantially augment the comprehensiveness and depth of insights derived from the present research.

DECLARATIONS

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Appendix

MOOC Student Satisfaction Survey's Turkish Adaptation

	Hiç Katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Tamamen Katılıyorum
Ders İçeriği					
Dersin hedeflerini anladım.	1	2	3	4	5
Üniteleri yeterli buldum.	1	2	3	4	5
Üniteleri, takibi kolay ve anlaşılır buldum.	1	2	3	4	5
Kullanılan multimedya materyallerini (videoları) ilgi çekici buldum.	1	2	3	4	5
Kullanılan multimedya materyallerini ders içeriğine uygun buldum.	1	2	3	4	5
İçeriği açıklamak için örnekler, görseller ve gerçek olay durumları etkili bir şekilde kullanılmıştı.	1	2	3	4	5
Dersin İşlenişi					
Programın hızından memnundum.	1	2	3	4	5
Dersin işlenişinde bir sorun yaşamadım.	1	2	3	4	5
Öğrenme hedeflerinin her birini, öğrendiklerimle ilişkilendirebildim.	1	2	3	4	5
Ders, beklentilerimi karşıladı.	1	2	3	4	5
Dersin Değerlendirilmesi					
Değerlendirme kriterlerinin ve yönteminin öğrenmemi ölçmede yeterli olduğuna inanıyorum.	1	2	3	4	5
Yapmam gerekenler için belirlenen son tarihlerin makul olduğunu düşünüyorum.	1	2	3	4	5
Dersi tamamlamam için gerekenler, tam dikkat gerektiriyordu ve oldukça zorlayıcıydı.	1	2	3	4	5
Ders Yardımı					
Dersin işlendiği internet sitesinde kolayca gezinebildim.	1	2	3	4	5
Kitlesel açık çevrim içi ders destek hizmeti hızlıydı.	1	2	3	4	5
Forumlarda (yorumlar, eğiticiyle iletişim vb.) etkileşimde bulunmak, anlamadığım şeyleri netleştirmeme yardımcı oldu.	1	2	3	4	5
Genel Memnuniyet					
Genel olarak bu dersin kalitesinden memnunum.	1	2	3	4	5
Genel olarak bilgi / becerilerimi geliştirdim.	1	2	3	4	5
Gelecekte başka bir kitlesel açık çevrim içi derse kaydolmayı isterim.	1	2	3	4	5