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ADAPTATION OF THE ONLINE SELF-REGULATION QUESTIONNAIRE (OSRQ) IN THREE TYPES OF INTERACTION INTO TURKISH: A VALIDITY AND RELIABILITY STUDY

Recep Çakır¹, Mehmet Kara², Volkan Kukul³

Abstract

Self-Regulation is a determinant as a dimension of student autonomy on the achievement of online distance education programs. In this respect, measurement of self-regulation has been a crucial issue in online education studies since identification of student inputs is an essential part of online course or program design. Considering the unavailability of a measurement instrument for online self-regulation in three types of interaction as appropriate with Turkish language and culture, the current study aims to adapt Online Self-Regulation Questionnaire (OSRQ) into Turkish. The data were collected from 307 graduate and undergraduate students enrolled in fully online programs. The instrument includes 30 items and three factors; namely, Self-Regulation in interaction between student and teacher, Self-Regulation in interaction between student and student, and Self-Regulation in interaction between student and content. The content validity of the instrument was provided in its development study. The language equivalency was ensured through back-translation procedure. Confirmatory factor analysis was conducted to test its construct validity. Internal consistency was provided through the calculation of Cronbach's Alpha coefficients. Item consistency was ensured via the calculation of the corrected item-total correlations. Finally, item discrimination was tested by performing independent samples t-test. The results indicated that OSRQ in three types of interaction is a valid and reliable instrument for the utilization in Turkish distance education settings.

Keywords: Self-Regulation; Interaction; Online Learning; Validity; Reliability

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ÜÇ ETKİLEŞİM TÜRÜNDE ÇEVİRİMİÇİ ÖZ DÜZENLEME ANKETİNİN TÜRKÇEYE UYARLANMASI: GEÇERLİK VE GÜVENİRLİK ÇALIŞMASI

Öz

Öz düzenleme, uzaktan eğitim programlarının başarıya ulaşmasında öğrenci özerkliğinin bir boyutu olarak belirleyici rol oynamaktadır. Bu bağlamda, çevrimiçi ders tasarımı için öğrenci girdilerinin ölçülmesi gerekli olduğundan, çevrimiçi uzaktan eğitim çalışmalarında öz düzenlemenin ölçülmesinin önemli olduğu düşünülmektedir. Türk dili ve kültürüne uygun üç etkileşim türünde çevrimiçi öz düzenleme için bir ölçme aracının bulunmaması göz önüne alındığında, mevcut çalışma “Üç Etkileşim Türünde Çevrimiçi Öz Düzenleme Anketi”ni Türkçe'ye uyarlamayı amaçlamaktadır. Veriler, çevrimiçi programlara kayıtlı 307 lisans ve yüksek lisans öğrencisinden toplanmıştır. Ölçme aracı 30 maddeden ve üç faktörden oluşmaktadır. Bunlar; öğrenci ve öğretmen arasındaki etkileşimde öz düzenleme, öğrenci ve öğrenci arasındaki etkileşimde öz düzenleme ve öğrenci ve içerik arasındaki etkileşimde öz düzenlemedir. Kapsam geçerliği, geliştirme çalışmasında sağlanmıştır. Aracın dil eşdeğerliği ise, geri çeviri prosedürü ile sağlanmıştır. Yapı geçerliliğini test etmek için doğrulayıcı faktör analizi yapılmıştır. İç tutarlılık, Cronbach Alpha katsayısının hesaplanmasıyla ve madde tutarlılığı düzeltilmiş madde-toplam korelasyonlarının hesaplanmasıyla sağlanmıştır. Son olarak, madde ayırt ediciliği, bağımsız örneklem t-testi yapılarak test edilmiştir. Sonuçlar, üç etkileşim türündede çevrimiçi öz düzenleme anketinin, Türkiye bağlamında çevrimiçi uzaktan eğitim ortamlarında kullanım için geçerli ve güvenilir bir araç olduğunu göstermiştir.

Anahtar Kelimeler: Öz Düzenleme; Etkileşim; Çevrimiçi Öğrenme; Geçerlik; Güvenirlik

Geniş Özet

Etkileşim, mevcut uzaktan eğitim kuramlarının merkezi bir ögesidir. Etkileşim, çevrimiçi ortamlarda öğrencilerle öğretmen ve öğrenme materyalleri gibi diğer öğeleri arasındaki karşılıklı eylemler olarak tanımlanabilir. Moore (1989), uzaktan eğitimde üç etkileşim türünü tanımlayarak, bunları öğrenci-öğretmen, öğrenci-öğrenci ve öğrenci-içerik etkileşimleri olarak isimlendirmiştir. Sonrasında, çevrimiçi etkileşim üzerine yapılan birçok araştırma, üç etkileşim türünün öğrenci çıktıları üzerinde etkili olduğunu ortaya koymuştur (Alqurashi, 2019; Agudo-Peregrina et al., 2014; Ekwunife-Orakwue & Teng, 2014; Shea, Joaquin, & Wang, 2016). Bernard vd. (2009) tarafından yapılan bir meta-analiz çalışması üç etkileşim türünün öğrenci başarısı üzerinde önemli bir etkisi olduğunu göstermiştir.

Çevrimiçi uzaktan eğitim ortamlarında üç etkileşim türünü etkileyen, öğretmen ve öğrenci özellikleri, çevrimiçi derslerin tasarımı ve kullanılan etkileşimli teknolojiler gibi çeşitli etkenler vardır. Moore (1993), özellikle diyalogun düşük ve ders veya program yapılarının esnek olmadığı uzaktan eğitim ortamlarında uzaktan eğitim öğrencilerinin öz düzenleme becerilerinin, eğitimin başarısı için gerekliliğine dikkat çekmiştir. Öz düzenleme, öğrencilerin öğrenmeye yönelik kullandıkları stratejileri ve yaptıkları düzenlemeleri değerlendirmeleri olarak tanımlanabilir (Pintrich, & De Groot, 1990). Çevrimiçi öz düzenleme üzerine yapılan pek çok araştırma, öğrencilerin öz düzenleme becerilerinin, öğrenci çıktıları üzerinde etkili olduğunu göstermiştir (Broadbent, 2017; Cho, Kim, & Choi, 2017; Cho & Shen, 2013; Sun &

Rueda, 2012; Yukselturk & Bulut, 2007). Buna rağmen, geleneksel eğitim ortamlarında kullanılan öz düzenleme kavramının çevrimiçi ortamlarda yapılan öz düzenleme çalışmalarını sınırlandırdığına dair eleştiriler de getirilmiştir (Broadbent & Poon, 2015; Cho & Cho, 2017; Cho & Kim, 2013). Bu eleştirileri dikkate alarak, Cho ve Jonassen (2009), etkileşim düzenlemesi kavramını ortaya atmış ve çevrimiçi öğrencilerin kendi aralarında ve öğretmenleriyle etkileşimlerini düzenleme becerileri olarak tanımlamışlardır. Daha sonra yapılan çalışmalar, çevrimiçi ortamlarda etkileşim düzenlemesi ve öğrenci çıktıları arasındaki pozitif ilişkiyi ortaya koymuştur (Cho & Cho, 2017; Cho & Kim, 2013). Cho ve Cho (2017), çevrimiçi öğrencilerin üç etkileşim türünde öz düzenleme becerileri ile öğrenme öz yeterliği ve ders memnuniyeti arasındaki pozitif ilişkiyi ortaya koymuştur.

Öğrenci özellikleri, çevrimiçi derslerin tasarımı sürecinin merkezi girdileridir. Çevrimiçi öğrencilerin etkileşime yönelik öz düzenlemelerinin belirlenmesi ve buna göre çevrimiçi derslerin tasarlanması, çevrimiçi eğitimin başarısı için bir gereksinimdir. Bu noktadan hareketle bu çalışmanın amacı Cho ve Cho (2017) tarafından geliştirilen üç etkileşim türünde öz düzenleme anketinin Türkçe'ye uyarlanmasıdır.

Bu amaç çerçevesinde yapılan uyarlama çalışmasına 307 önlisans ve yüksek lisans öğrencisi katılmıştır. Ölçeğin faktör yapısına ilişkin modelin uygunluğu Doğrulayıcı Faktör Analizi (DFA) ile test edilmiştir. Modelin uygunluğuna ilişkin analiz sonuçlarına göre; $\chi^2/df=2.79$; RMSEA değeri .07; NNFI değeri .92; SRMR değeri .05; CFI değeri .92; ve PNFI değeri .81 olarak elde edilmiştir. Cronbach alpha güvenilirlik analizi sonucunda ölçeğin güvenilirlik katsayısı .98, alt boyutların sırasıyla .96, .96 ve .95 olarak hesaplanmıştır. Madde ayıricılıklarını test etmek için alt %27 üst %27 arasındaki fark incelenmiş ve gruplar arasında .001 düzeyinde anlamlı farklılık olduğu tespit edilmiştir. Tüm bu sonuçlar ölçeğin geçerli ve güvenilir bir ölçek olduğunu ortaya koymaktadır.

Introduction

Interaction has been a key element in the existing theories of distance education. It refers to the mutual actions between learners and other elements of education such as teacher and learning materials. The early implementations of distance education overlooked interaction (Abrami et al., 2011). However, relatively recent implementations of online distance education with particularly the advent of interactive web Technologies have paid more significance to interaction. Moore (1989) characterized interaction in distance education as three types of interaction and named them as learner-teacher, learner-learner, and learner-content. Three types of online interaction in online education are defined as follows:

Student and Teacher interaction: It is an interaction between student and teacher or the experts developed the learning materials (Moore, 1989). The roles of teachers in this interaction are to enhance or maintain learner interest as well as their self-direction and self-motivation and to motivate them for learning. Teacher might interact with students via diverse technological tools such as e-mail, forums, social media groups, and so forth. Students are expected to actively interact with their instructors to meet their learning needs (Cho & Jonassen, 2009). Such an interaction is also a necessity for learners to know what they want to do, which subjects require additional explanation or support, or what difficulties they face (Cho & Cho, 2017; Cho & Jonassen, 2009).

Student and student interaction: It is an interaction among students, might occur alone or in group, and with or without the real-time participation of teacher (Moore, 1989). Moore (1989) characterizes it as a valuable resource for learning and even a necessity in some cases. Through student-student interaction, students have an opportunity to discuss on a topic and socially exchange knowledge with each other. In distance education systems, students are expected to share information, provide constructive feedback, request assistance, and help each other in collaboration (Cho & Cho, 2017). They might interact with each other by using tools such as forums, e-mail, social media groups, discussion forums, asynchronous or synchronous chatting, and video conferencing (Abrami et al., 2011; Cho & Cho, 2017).

Student and Content interaction: It is an intellectual interaction between learners and the content that results in changes in learners' understanding, perspective, and cognitive structures (Moore, 1989). Moore (1989) defines this type of interaction as the defining characteristic of education. This interaction enables students to understand content, build knowledge or change their perspectives (Cho & Cho, 2017; Moore, 1993). Student-content interaction can be in various formats including text, articles, audio presentations, videos, or PowerPoint slides, where learning content is available (Abrami et al., 2011; Cho & Cho, 2017).

Three Types of Interaction and Self-regulation in Online Distance Education

Since their introduction, the research studies on three types of interaction have been further confirmed their positive influence on learner outcomes in online education environments (e.g. Bolliger & Halupa, 2018; Ekwunife-Orakwue & Teng, 2014; Paul et al., 2015). A meta-analysis study by Bernard et al. (2009) indicated that three types of interaction are influential on success in online education environments since they have a significant influence on learner achievement. It has been clearly revealed by the further studies that interaction affects such learner outcomes as learner engagement (Bolliger & Halupa, 2018), social presence (Horzum, 2015), learner achievement (Agudo-Peregrina et al., 2014; Ekwunife-Orakwue & Teng, 2014; Shea et al., 2016), perceived learning (Alqurashi, 2019) satisfaction (Alqurashi, 2019; Ekwunife-Orakwue & Teng, 2014; Kuo et al., 2014; Paul et al., 2015; Shea et al., 2016; Swart et al., 2014). For example, a study by Alqurashi (2019) investigated how interaction predicts perceived learning (as an indicator of student success) and satisfaction (as an indicator of the evaluation of online courses). The results showed that three types of interaction significantly predict perceived learning and satisfaction. The results suggest that three types of interaction is a determinant factor on both student learning and the quality of the courses offered online.

There might be several factors influencing interaction in online learning environments such as teacher and learner characteristics, design of online courses, and interactive Technologies used. Moore (1993) argues that distance learners would need greater autonomy in cases that they have less dialogue and flexibility. He also underlines learners' Self-Regulation (SR) skills as an underlying factor for their autonomy. SR can be defined as an assessment of the benefits of the strategies and regulations made by individuals for learning (Pintrich, & De Groot, 1990). It is a requirement for distance learners to have SR skills to keep their autonomy and navigate through learning materials for the accomplishment of learner outcomes (Bol, & Garner, 2011). Several research studies indicated that learners' use of SR skills is a determinant factor on learner outcomes (Broadbent, 2017; Cho, Kim, & Choi, 2017; Cho & Shen, 2013; Sun & Rueda, 2012; Yukselturk & Bulut, 2007). Broadbent and Poon (2015) revealed, as a result of their systematic literature review study, that there is a positive relationship between learners' use of SR skills and their academic outcomes.

Considering distance education as the educational activities offered by an institutional organization through communication technology with an independence of time and place (Moore & Kearsley, 2011), the impact of SR on learner outcomes is possibly due to the flexibility in distance education. According to Sun and Rueda, (2012), online education requires students to plan their own learning since online learning environment offers independence of time and place. Broadbent and Poon (2015) argue that although there are many studies suggesting a positive relationship between SR strategies and academic outcomes in traditional learning environments, there are few comparative studies on SR strategies and academic achievement in online learning environments.

Self-regulation in Three Types of Online Interaction

Several scholars have argued that the traditional use of SR concept in online distance education context limits SR research in this context (Broadbent & Poon, 2015; Cho & Cho, 2017; Cho & Kim, 2013). Based on these critics and putting the role of interaction and SR together, Cho and Jonassen (2009) proposed a concept called interaction regulation or SR in interaction. They defined it as the capability of online learners to regulate interaction among them and with teachers. The studies conducted after the introduction of this concept demonstrated its influence on learner outcomes. A study by Cho, Demei, and Laffey (2010) revealed the positive relationship between interaction regulation and the learner outcomes of social presence, participating in a learning community, and perceived learning. Cho and Shen (2013) found out that interaction regulation is a predictor of the time spent in online courses. In other words, they concluded that learners with more interaction regulation spent more time in online courses. In a relatively recent study, Cho and Cho (2017) showed the positive relationship between SR in three types of interaction and learners' self-efficacy for learning and learners' satisfaction with the course.

Cho and Cho (2017) argued that although there are scales that measure SR learning in traditional settings, it was inconvenient to use them in online environments. They also stated that the ones used in traditional environments may not accurately reflect the unique characteristics of the way students learn in online environments. In addition, the validity and reliability studies of these scales are required to be conducted to use them within online environments. Because of such factors, Cho and Cho (2017) developed a novel online SR questionnaire that measures SR in three types of interaction in online environments. They conducted the validity reliability study of this instrument. In their study with 799 online students, they conducted exploratory factor analysis and Confirmatory Factor Analysis (CFA). The results show that the instrument has satisfactory validity and reliability for the usage in further studies with three factors and 30 items.

Purpose of the Study

The studies conducted in the distance education context of Turkey confirmed that SR (e.g. Yukselturk & Bulut, 2007) and interaction (e.g. Horzum, 2015) is influential on learner outcomes. Online learners' SR is a determinant factor on their achievement of the instructional objectives as mentioned. For this reason, it is a necessity to measure their SR in three types of interaction and design learning environments, accordingly. In this regard, the aim of this present study is to adapt the Online SR Questionnaire (OSRQ) in three types of interaction developed by Cho and Cho (2017) into Turkish language and culture through the required validity and reliability analyses. Considering the unavailability of this sort of

instrument appropriate with Turkish language and culture, the currently conducted validity and reliability study will contribute to the literature by adapting a measurement instrument in this regard.

Method

Participants

The study was conducted with the participation of 307 university students registered to the fully distance education programs in the academic year of 2017-2018. Convenient sampling method was utilized for the selection of the participants due to their availability to the researchers. According to Fraenkel, Wallen, and Hyun (2012, p.100), in case that convenience sampling is used, the demographics and characteristics of the participants are required to be presented. For this reason, the demographics of the participants were provided and explained. The demographic information of the participant is given in Table 1 below.

In terms of the participants' ages, most of them are younger than 41. The maximum number of participants (n=175, %57.0) are in the age range of 18-24 followed by the range of 25-30 (n=73, %23.8) and 31-40 (n=49, %16.0). As for the distance education programs, it was observed that 106 (%34.5) of the participants are from Child Development program. The second is Medical Documentation and Secretary (n=92, 30.0) and the third is Mechatronics (n=43, 14.0). The number of the participants from the other departments varies between 2 (%0.7) and 19 (%6.2).

In terms of the distance education experience, the currently enrolled distance education program is the first experience for most of them. It is the first experience for 282 (%91.9) of the participants while 24 (%7.8) of the participants has previous distance education experience.

Table 1. Demographics of the Participants

	n	%
Age		
18-24	175	57.0
25-30	73	23.8
31-40	49	16.0
41-50	8	2.6
51 and over	1	.3
Missing	1	.3
Department		
Child Development	106	34.5
Medical Documentation and Secretary	92	30.0
Mechatronics	43	14.0
Internet and Network Technology	19	6.2
Instructional Technology Master's Program	16	5.2
Primary School Education Master's Program	11	3.6
Electrics	11	3.6
Renewable Energy and Applications Master's Program	7	2.3
Elderly Care	2	.7
Distance Learning Experience before the current Program		
No	282	91.9
Yes	24	7.8
Missing	1	.3
Gender		
Female	201	66.5
Male	106	34.5
Total	307	100.0

Students participated in the online courses and accessed learning materials on a Learning Management System (LMS). The used LMS includes such components as e-mail, discussion forums, announcements, and online exams. A web conferencing system allowing them to attend synchronous lessons is integrated to this LMS. Thus, they synchronously met instructors via this system in each week of a semester. Online students have interaction opportunities among them on both LMS and social networking sites. They took mid-term exams online on the LMS and visited campus for the final exams.

The Online Self-Regulation Questionnaire (OSRQ) in Three Types of Interaction

The validity and reliability study of the OSRQ in three types of interaction was conducted by by Cho and Cho (2017). The instrument was developed with the participation of 799 undergraduate students who attended online courses at two universities in the United States. 247 (30.9%) of the participants were male, 552 (69.1%) were females. The conceptual framework was established as the first step in the development process. As a result of this framework, it was decided by the authors that the factors of the instrument were three different interaction types (Student - Content, Student - Teacher, Student - Student). Explanatory factor analysis was conducted with 400 randomly selected participants with 38 items obtained and 8 items were extracted from the instrument. As a result of the analysis, 30 items were collected under 3 factors and 58.84% of the total variance was explained. The factor analysis was replicated through CFA with a different sample. The fit indices indicated

that the collected data satisfactorily fit the model ($\chi^2 = 1223.35$, CFI = .91, TLI = .90, SRMR = .06, and RMSEA = .07”).

The reliability coefficients of the factors were calculated as .94 for SR in interaction between student and content, .91 for SR in interaction between student and student and .94 for SR in interaction between student and teacher. The instrument was also tested by checking the relationship between the currently developed scale and self-efficacy for learning and course satisfaction. The results showed high and positive correlations between the instrument and the other variables ($p < .001$). CFA was also performed to test the structural equation model fit between the factors and “self-efficacy for learning” and “course satisfaction”. It was observed by the authors that the model fit was satisfactory ($\chi^2(887, N=799)=3803.79$, CFI=.90, TLI=.90, RMSEA=.06, and SRMR = .05”).

Adaptation Procedure

Before starting to the adaptation procedure, the permission was obtained from the authors developed the instrument to adapt it to Turkish. After obtaining the necessary permissions, the items in the instrument were translated into Turkish language through back-translation procedure so as to ensure the language equivalency. The construct validity was tested through CFA. Internal consistency of the instrument was tested through the calculation of Cronbach’s Alpha coefficient. As for the item consistency, corrected item-total correlations were calculated for each item. Finally, independent samples t-test was conducted between the upper and lower 27% groups of the participants for each item to provide item discrimination.

Results

Content Validity and Language Equivalency

The content validity of the instrument was provided by Cho and Cho (2017) in the development study through the review of the relevant literature and their experience in online learning as well as expert evaluation on the generated items. Thus, the first step to adapt it into Turkish language and culture was to ensure its language equivalency. Based on this aim, the instrument was firstly translated into Turkish language by a professional of English Language teaching. Then, the translated instrument was again translated from Turkish to English by another professional of English Language teaching. Both the original and translated ones in English were compared and confirmed in terms of the meanings of the items by an expert of English language. The final version of the translated instrument in Turkish was evaluated by the professionals experienced in distance education and by an expert of Turkish language so as to ensure that the items in it can be easily understood by the Turkish students.

Construct Validity

CFA was conducted to test the construct validity of the instrument. In other saying, it was conducted to test how well the currently collected data fit the previously proposed model. The standardized path diagram produced via CFA showed that the factor loadings of the items ranged from .68 to .91. As clearly observed, each of these loadings are greater than .40 (see Appendix A), which is a cutoff criterion recommended by Stevens (2012, p.333). While the least loading was gathered for the item 28 within SR in interaction between student and student, “I regularly check other students’ messages on the discussion board.”, the highest

one was gathered for the item 15 within SR in interaction between student and teacher, "I ask the instructor to clarify information if it is not clear to me.". The path diagram further illustrated the correlations between the factors. The correlation between "SR in interaction between Student and Student" and "SR in interaction between Student and Content" is obtained as .85; the one between "SR in interaction between Student and Teacher" and "SR in interaction between Student and Student" was observed as .90; and finally the one between "SR in interaction between Student and Teacher" and "SR in interaction between Student and Content" was obtained as .93. These results mean a positive strong correlation between the factors according to Dancy and Reidy (2002, p.176) and imply the existence of a higher order construct in the model.

In spite of the lack of certain criteria to report the obtained fit indices, Mulaik et al. (1989) recommends reporting chi-square (χ^2), degrees of freedom (df), p value, Comparative Fit Index (CFI), Standardized Root Mean Square Residual (SRMR), Root Mean Square Error of Approximation (RMSEA), and at least one parsimony fit index. In other words, they suggest the report of the three types of fit indices; namely, absolute, incremental, and parsimony fit indices. Based on this suggestion, the current study reported the fit indices of normed chi-square (χ^2/df), RMSEA, SRMR, Non-Normed Fit Index (NNFI), also known as Tucker-Lewis Index (TLI), CFI, and Parsimonious Normed Fit Index (PNFI) as the evidence for the model fit of the currently tested instrument as shown in Table 2 below.

In the present study, the p value was obtained as significant at .05 level of significance ($p < .05$). Even though this means that the data unsatisfactorily fit the previously proposed model, the fit indices provide the most fundamental evidence to indicate how well the data fit the proposed model (Mulaik et al., 1989). Based on this notion, the fit indices produced through CFA were reported as the evidence of the model fit. The CFA results produced 2.79 as the value of normed chi-square, χ^2/df . The gathered value indicates acceptable model fit based on the suggested threshold for this value, required to be less than .05 for model fit (Wheaton et al., 1977).

Table 2. Obtained Fit Indices for the Currently Tested Instrument

Index Category	Fit Index	Acceptance Criteria	Obtained Results
Absolute Fit Indices	χ^2/df	<.05 (Wheaton et al., 1977)	2.79
	RMSEA	<.07 (Steiger, 2007)	.07
	SRMR	<.08 (Hu & Bentler, 1999)	.05
Incremental Fit Indices	NNFI	>.80 (Hooper et al., 2008)	.92
	CFI	>.90 (Hu & Bentler, 1999)	.92
Parsimony Fit Indices	PNFI	>.50 (Mulaik et al., 1989)	.81

Secondly, the RMSEA value was gathered as .07, which imply an acceptable value for model fit since it is about the upper threshold limit for this index (Steiger, 2007). SRMR value was gathered as .05, which is an acceptable value for the model fit as it is less than the value of .08 recommended as the model fit by Hu and Bentler (1999). The CFA produced a NNFI (TLI) value of .92. This value was assumed as acceptable for model fit since the values as low as .80 are recommended as acceptable (Hooper, Coughlan, & Mullen, 2008). Similarly, a value of .92 was obtained for CFI. For this index, the values greater than .90 show acceptable fit (Hu & Bentler, 1999). Thus, the obtained value in the current study indicates an acceptable model fit. The last fit index checked in this study is a parsimony fit index, PNFI. The gathered value for this index is .81. Although there is no absolute criterion for this index to be acceptable, Mulaik et al. (1989), who also developed this index, recommend that values in the region of .50 are

acceptable. Therefore, this index was also reported as acceptable for the fitness of the model currently tested in this study.

Internal Consistency of the Instrument

The Cronbach’s Alpha value of the total instrument was produced as .98. The Alpha values checked for the internal consistency of the factors in the instrument were found as .96 for “SR in interaction between student and content”; .96 for “SR in interaction between student and teacher”; and finally .95 for “SR in interaction between student and student”. According to Field (2009, p.675), the values greater than .70 indicate high consistency for the instrument. With this in mind, the results demonstrate high consistency in the total instrument and all factors.

Item Consistency

Corrected item total correlations were calculated for the consistency of the items in the instrument. As indicated in the table below, the calculated corrected item total correlations ranged from .64 to .87. In order for a scale to be reliable, item total correlations for each item are required to be greater than .3 (Field, 2009, p.678). Thus, the obtained results provides high reliability in terms of item consistency in the instrument and they were aimed to measure similar behaviors.

Item Discrimination

Table 3 also demonstrates the results of the independent samples t-test conducted to test item discrimination. In other words, it was conducted to test if there was a difference between the upper 27% (N=83) and lower 27% (N=83) of the participants for each item. The results indicated that there was a significant difference between the upper and lower 27% of the groups for each item (p<.001). These results suggest that all items in the instrument are satisfactorily discriminant to measure self-regulation in three types of interaction. In other words, the items are all reliable to differentiate the participants with high self-regulation from the ones with low self-regulation.

Table 3. Corrected Item-Total Correlations and the Results of the Independent Samples t-test for each item between the Upper and Lower 27% of the Participants

Item	Item-Total Correlation ¹	t (Upper-Lower 27%)	Item	Item-Total Correlation ¹	t (Upper-Lower 27%)	Item	Item-Total Correlation ¹	t (Upper-Lower 27%)
i1	.68	12.40***	i19	.84	19.43***	i13	.82	17.22***
i5	.78	14.14***	i4	.80	15.98***	i17	.78	17.93***
i27	.80	17.94***	i24	.77	17.95***	i11	.81	17.83***
i26	.72	13.71***	i30	.80	17.63***	i8	.79	15.65***
i2	.77	13.40***	i22	.68	17.63***	i10	.84	18.47***
i21	.82	20.54***	i16	.86	20.01***	i25	.81	20.14***
i3	.78	14.73***	i23	.83	20.32***	i7	.79	14.23***
i9	.84	16.40***	i12	.80	17.78***	i14	.85	15.91***
i6	.84	16.01***	i18	.83	16.73***	i15	.88	20.82***
i20	.83	16.44***	i29	.76	15.50***	i28	.64	13.67***

¹ n=307 ²n1=n2=83 ***p<.001

Conclusion

In this study, OSRQ in three types of interaction, developed by Cho and Cho (2017), was adapted to Turkish language and culture. The instrument consisted of three factors and 30 items. The data for validity and reliability analysis was collected from 307 distance education students at undergraduate and graduate levels. Firstly, the language equivalency was provided through back-translation procedure. Secondly, CFA was conducted to test the construct validity of the instrument. The results of CFA showed that model fit indices are obtained to ensure the model fit with the currently collected data. The CFA results of the current study produced quite similar goodness of fit indices with the development study of the instrument conducted by Cho and Cho (2017). In the same vein with the development study by Cho and Cho (2017), Cronbach's Alpha coefficients calculated for internal consistency for each factor indicated its reliability in terms of internal consistency. Finally, corrected item-total correlations and the results of the independent samples t-test between the upper and lower 27% groups provided reliability in terms of item consistency and item discrimination, respectively. Thus, it was concluded OSQR is a valid and reliable instrument based on the analyses conducted for its construct validity, internal consistency, item consistency, and item discrimination.

According to the relevant literature, there was no available instrument to measure self-regulation in three types of interaction in Turkish appropriate with Turkish culture. For this reason, this study made a contribution to the literature that this valid and reliable instrument might be used in future studies to measure SR in three types of interaction in Turkish context. Learner inputs are a requisite for the design of online learning environments so as to individualize instruction offered at a distance. In this sense, identification of learners' entry characteristics including self-regulation in online interaction is a determinant factor on the achievement of distance courses and programs. The adapted questionnaire would serve as an instrument to measure and evaluate online learners' self-regulation in online interaction and to design distance learning environments meeting their learning needs. Finally, future studies might focus on investigating the relationship between SR in three types of interaction and self-efficacy for learning and learner outcomes such as course satisfaction, academic achievement, social presence, and engagement as done in the development study to empower the instrument's construct validity.

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APPENDIX A

Items in Original Language	Items in Turkish	Factor Loadings
Self-Regulation in Interaction between Student and Content	Öğrenci ve İçerik arasındaki Etkileşimde Öz-Düzenleme	
Before starting an assignment, I plan out my work.	Bir ödevde başlamadan önce, işimi planlarım.	.71
I regularly check the course guidelines to be successful in this online course.	Çevrimiçi derslerde başarılı olmak için ders yönergelerini düzenli olarak kontrol ederim.	.81
I monitor my own progress to make sure that I am on the right track in this online course.	Çevrimiçi derslerde doğru yolda olduğumdan emin olmak için kendi ilerlememi takip ederim.	.82
I plan my time to complete assignments in this course.	Çevrimiçi derslerdeki ödevleri tamamlamak için zamanımı planlarım.	.84
Before starting a learning task, I try to understand the nature of the task.	Bir öğrenme görevine başlamadan önce, görevin doğasını anlamaya çalışırım.	.81
I try to do my best to master the learning content in this course.	Çevrimiçi derslerde öğrenme içeriğine hakim olmak için elimden geleni yapmaya çalışırım.	.89
I regularly check this online course to keep up to date on learning tasks.	Öğrenme görevleri hakkında güncel bilgilere sahip olmak için Çevrimiçi dersleri düzenli olarak kontrol ederim.	.85
I set up my own due dates for assignments so that I do not procrastinate.	Ödevleri ertelememek için kendi bitiş tarihlerimi ayarlarım.	.83
I frequently reflect upon what I learned in this online course.	Çevrimiçi derslerde öğrendiklerim hakkında sık sık düşünürüm.	.88
I evaluate my assignments against evaluation criteria provided by the instructor.	Ödevlerimi, öğretim elemanı tarafından verilen değerlendirme ölçütlerine göre değerlendiririm.	.86
Before starting assignments, I check what I already know, what I do not know, and what I need to know.	Ödevlere başlamadan önce, halihazırda bildiklerimi, bilmediklerimi ve bilmem gerekenleri gözden geçiririm.	.84
Self-Regulation in Interaction between Student and Teacher	Öğrenci ve Öğretmen arasındaki Etkileşimde Öz-Düzenleme	
I ask the instructor questions if needed.	Gerektiğinde öğretim elemanına sorular sorarım.	.83
I seek assistance from the instructor if I need it.	İhtiyaç duyduğumda öğretim elemanından yardım isterim.	.86

Items in Original Language	Items in Turkish	Factor Loadings
I ask my questions as clearly as possible for effective communication with the instructor.	Öğretim elemanı ile etkili iletişim kurmak için sorularımı olabildiğince açık sorarım.	.89
I ask the instructor to clarify information if it is not clear to me.	Sunulan bilgi benim için açık değilse öğretim elemanından açıklığa kavuşturmasını isterim.	.91
I ask the instructor to clarify learning materials if I get confused.	Eğer kafam karışırsa, öğretim elemanından öğrenme materyallerini açıklığa kavuşturmasını isterim.	.90
I do not hesitate to share concerns about my progress with the instructor.	İlerleme durumumla ilgili endişelerimi öğretim elemanı ile paylaşmaktan çekinmem.	.80
If I need to, I explain my understanding about content to the instructor as thoroughly as possible.	İhtiyaç duyarsam, içerikle ilgili öğrendiklerimi öğretim elemanına olabildiğince ayrıntılı açıklarım.	.85
When unexpected situations arise that influence my participation or performance in this online course, I inform the instructor as soon as possible.	Çevrimiçi derslerdeki katılımımı veya performansımı etkileyen beklenmedik durumlar oluşursa en kısa sürede öğretim elemanına bilgi veririm	.84
I express my opinions to the instructor in a respectful manner in this online course.	Çevrimiçi derslerde, görüşlerimi öğretim elemanına saygılı bir şekilde ifade ederim.	.83
Self-Regulation in Interaction between Student and Student	Öğrenci ve Öğrenci arasındaki Etkileşimde Öz-Düzenleme	
I regularly interact with other students in this online course.	Çevrimiçi derslerde diğer öğrencilerle düzenli olarak etkileşim kurarım.	.88
I plan my participation in online interaction with other students in advance.	Diğer öğrencilerle çevrimiçi etkileşime katılımımı önceden planlarım.	.75
I attempt to help others online when given the opportunity.	Fırsat verildiğinde diğer öğrencilere çevrimiçi olarak yardım etmeye çalışırım.	.88
I would interact with other students even if it was not a course requirement.	Ders zorunlu olmasa dahi diğer öğrencilerle etkileşim kurarım.	.85
I use different interaction skills in this course depending on the learning situations.	Öğrenme durumlarına bağlı olarak bu derste farklı etkileşim becerilerini kullanırım.	.85
I try to match other students' conversation style when participating in this online course.	Çevrimiçi derslere katılımım sırasında diğer öğrencilerin	.76

Items in Original Language	Items in Turkish	Factor Loadings
	konuşma üsluplarına uyum sağlamaya çalışırım.	
I provide constructive feedback to other students' contributions in a discussion.	Bir tartışmada diğer öğrencilerin paylaşımlarına yapıcı dönüt veririm.	.82
I regularly check other students' messages on the discussion board.	Tartışma panosundaki (forumundaki) diğer öğrencilerin mesajlarını düzenli olarak kontrol ederim.	.68
I seek assistance from other students if I need it.	İhtiyaç duyduğumda diğer öğrencilerden yardım isterim.	.80
I respond to other students in a timely manner.	Diğer öğrencilere zamanında cevap veririm.	.84