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Deconstructing learner engagement: An expanded construct model for higher education learners

Meral Şeker[1,*]

[1]Alanya Alaaddin Keykubat University, Faculty of Education, Department of Foreign languages Teaching, Antalya, Türkiye

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Abstract: Despite the unanimous agreement regarding the positive outcomes of learner engagement, theorists and researchers draw attention to the disparate conceptualizations and structural models of "engagement" construct. The present study, in this respect, attempts to contribute to the development of a theoretical framework by suggesting a multidimensional overarching model for assessing higher education learner engagement. Following the descriptive research design, the study reports the initial model construction and validation results. The findings show significant differences from the earlier conceptualizations indicating a five-dimension model: academic-functional, cognitive, meta-cognitive, collaborative-social, and collaborative- academic engagement. While metacognitive engagement indicators form a distinct but integral dimension in the construct, the social dimension displays an idiosyncratic structure, implying that the multidimensional nature of the engagement construct has a situated nature. Pedagogical implications are discussed based on the engagement model validated.

1. INTRODUCTION

An increasing amount of research has reported the significant role of learner engagement in attaining `success`, which is usually accepted as the ultimate goal of both learners and educational institutions. High levels of learner engagement are found to correlate with numerous positive learning outcomes. For example, engagement is reported to enhance cognitive and metacognitive abilities such as critical thinking; developing practical competence; spending more time and energy on educationally meaningful tasks; learning actively and in collaboration with others and exploring and sharing ideas in and out of class; establishing relationships with the newly learned materials and professional lives (Mazer, 2013). With the help of enhanced cognitive involvement in academic tasks, engaged learners are more likely to exhibit increased performance and productivity (Kuh, 2009; Lam et al., 2012). In addition, engagement is also shown to be a significant predictor in other academic outcomes such as higher graduation and lower drop-out rates (Appleton et al., 2008; Padilla Rodriguez et al., 2020).

Studies have also revealed that engagement is an important mediator between contextual influences and satisfactory psychological and psycho-social states for learners (Fredricks et al.,

*CONTACT: Meral ŞEKER meral.seker@alanya.edu.tr Alanya Alaaddin Keykubat University, Faculty of Education, Department of Foreign languages Teaching, Antalya, Türkiye

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2004; Appleton et al., 2006). Engaged learners are reported to have higher self-esteem and satisfaction rates, to develop a positive identity as a member of the school community and feel connected while they become more confident to establish social relationships and more motivated to participate in extracurricular activities (Lam et al., 2012).

Although the substantial agreement among educators and researchers on the positive outcomes of engagement has proliferated the studies on the concept, theorists and researchers draw attention to the disparate conceptualizations and structural models of "engagement" construct (Aubrey et al., 2020; Dao et al., 2021; Tian & Zhou, 2020). The operationalizations of the research tools developed as a result of incomplete and/or weak conceptualizations and models present inconsistent and questionable findings, which leads to clouding the educational implications to improve learning conditions for higher levels of learner engagement (Kahu, 2013; Krause, 2012; Tian & Zhou, 2020; Zepke, 2014). Furthermore, recent studies report that learners' engagement levels have decreased substantially during compulsory online education because of the Covid-19 pandemic (Chiu, 2022; Yang et al., 2020) and thus, there is a need for instructional interventions to enhance learners' engagement, particularly in online education (Deng et al., 2020; Sun et al., 2020). The present study, in this respect, attempts to contribute to the development of a theoretical framework for engagement construct by proposing a social-constructivist perspective where specific context-related indicators are added to the model structure. It specifically aims to investigate the properties of learner engagement at higher education levels from learners' perspectives while exploring the psychometric qualities of the proposed learner engagement instrument. Following descriptive research design, the study presents the initial construction and validation results of the model. Pedagogical implications are presented based on the engagement model validated.

1.1. Deconstructing Learner "Engagement"

Depending on the base perspective, the concept of learner "engagement" is characterized quite differently. For researchers opting for a psychological perspective, engagement is mainly regarded as an emotional state. Schaufeli et al. (2002, 74), for instance, define engagement as a "... positive, fulfilling, work-related state of mind that is characterized by vigor, dedication, and absorption". The model and the tool developed, Engagement Scale, is based on this conceptualization with a three-dimensional structure involving vigor, dedication, and absorption. Engagement is also regarded as positive or negative feelings towards school such as a state of interest and willingness to participate in learning or negative feelings such as boredom or developing a sense of belonging to the school (Askham, 2008). The psychological perspective, however, fails to account for indicators beyond feeling or emotions and overlooks at cognitive, behavioral or social involvement of learners in learning, and thus, the conceptualizations and models based on the psychological perspective are criticized for their limited account of the construct (Llyod, 2014).

Adapting behavioral perspective, other researchers regard engagement as an effort, time and energy spent or reactions displayed to actively participate in learning activities. Theoretically based on a behavioristic perspective, the National Survey of Student Engagement (NSSE), as one of the most popular learner engagement tools in higher education, was developed in a project in the United States by Kuh (2009) and has been widely used since then. Viewing engagement as a dynamic construct conveying not only learner behaviors but also institutional and teaching practices, it was developed as a measurement tool to identify engagement rates and tendencies of college students to improve education quality (Zhoc et al., 2019). The survey has five scales: academic challenge, active learning, interactions with students and staff, enriching educational experiences, and supportive learning environment (NSSE, 2010). As another popularly used tool, The Australasian Survey of Student Engagement (AUSSE) was

developed based on NSSE. AUSSE has added one scale to NSSE, work-integrated learning, to identify engagement in regard with students' career planning (Coates, 2010).

Despite the popularity of these two scales, they are not without criticisms. The main line of the criticisms is related to the way learner engagement is conceptualized. It is claimed that defining engagement within behavioral perspective as "[the] time and the effort students devote to educationally purposeful activities" (AUSSE, 2010, 1) is limited as it does not represent the psychological or the affective dimensions of engagement (Axelson & Flick 2011; Hagel et al., 2012; Kahu, 2013). It is also debated that the scales' domain definition is too broad, which leads to confusion and to questioning the theoretical bases of the items (Zhoc et al., 2019). The NSSE is also found to have intermingled learner engagement as a dependent variable with independent variables such as features related to the learning environment (Lam et al., 2012; Zhoc et al., 2019). Another criticism is directed towards the predictive validity of the survey claiming that the scale's benchmarks show weak correlations with academic success (Hagel et al., 2012) as it fails to acknowledge all the interacting dimensions of the engagement construct. As Kahu (2013) also notes, focusing on a single facet of the construct and overlooking at the other interlinked dimensions results in a limited understanding of this complex construct.

The behavioristic perspective on learner engagement also fails to reflect contextual influences and thus misses the situational and individual factors as well. As Appleton et al. (2006) also suggest, the validation procedures carried out are contingent on the sample from which the data was obtained. That is, engagement is thought to be in a cyclical interaction with contextual variables. Thus, the validity of the operationalizations of these tools in different contexts and the implications drawn are criticized as they do not account for variables such as cultural or linguistic features of the learners and the institutions involved (Glanville & Wildhagen, 2007; Krause, 2012) while leaving the differences in the qualities of different disciplines out (Nelson Laird et al., 2008).

Some researchers view engagement as a combination of behavioral and psychological involvement in academic work (e.g., Appleton et al., 2006; Glanville & Wildhagen, 2007). The models proposed are two-, three-, or four-dimensional. In the two-dimensional models, behaviors and emotions constitute the construct. The three-dimensional models, on the other hand, include behavioral, cognitive, and emotional or affective dimensions (e.g., Fredricks et al., 2004). Others propose four-dimensional models including either an academic component (Appleton et al., 2006) or a social component (Finn & Zimmer, 2012; Zhoc et al., 2019) in addition to behavioral, cognitive, and psychological components.

However, the tools developed based on these multidimensional models have also been questioned, particularly in terms of validity. In fact, researchers have pointed out that such tools need to have a clear distinction between the indicators and the facilitators based on clearly determined criteria to distinguish among the indicators and/or among the facilitators (Fredricks et al., 2004). For example, the model proposed by Appleton et al. (2006), which has a taxonomy for engagement including four subtypes: academic, behavioral, cognitive, and psychological, sets a clear distinction between the indicators and the outcomes of engagement. However, while accounting for the multiple dimensions of engagement, the taxonomy fails to have definite criteria to distinguish among the indicators. For example, while 'credits hours towards graduation' is considered as an academic indicator, 'extra credit options' is regarded as a behavioral indicator. Furthermore, applying self-regulated strategies is categorized under cognitive engagement. However, self-regulation covers not only cognitive involvement but metacognitive, social and affective activation of strategies as well (e.g., Oxford, 2011).

2. METHOD

The present study has been conducted following descriptive research design and reports the initial model construction and validation results of a multidimensional construct model with the aim to contribute to the development of a theoretical framework for assessing higher education learner engagement. The first step to generate the indicators involved an extensive review of literature pertaining to learner engagement in order to examine the conceptualizations and the models presented in the field of educational research as well as to build a theoretical framework in order to guide in the development of the item pool for the scale.

Following the review of relevant literature, semi-structured interview questions were prepared to identify (a) the learners' perceptions of the concept of engagement, (b) their levels of engagement, (c) and how they actualize engagement. The interviews were recorded and the participants were asked to write a composition of 250-350 words on how they define an engaged learner and 21 of them volunteered to participate. They wrote their essays the next day after the interviews and submitted them anonymously. Following verbatim transcription of the recorded data and the first analysis of the learner compositions, systematic content analysis was conducted by the researcher and a fellow researcher separately to identify the emerging themes. Here, in order to identify the degree of agreement between the themes elicited by the two researchers, the inter-coder reliability was measured using Cohen's kappa. The agreement value indicated high reliability (.83) (Cohen, 1969).

After the themes gathered from the literature review and the learner interviews were compared, the next step involved categorizing the common themes under the relevant groups. The themes that were confusing or that seemed too abstract or irrelevant were excluded from the scale. After the items and the dimensions were identified, the accuracy and clarity of the items were revised first by the researcher. Upon the modifications made, two other researchers working at the same university revised the scale: one was an expert in statistics and the other was an expert in educational assessment. After the revisions and the alterations suggested were completed, the questionnaire at this stage had two parts. The first part included five questions related to learners' demographic information: age, gender, their universities and departments. The second part included 45 items in a five-point Likert Scale format, anchored by 'always' (1), 'often' (2), 'sometimes' (3), 'rarely' (4), and 'never' (5). The scale was developed and presented to the participants in Turkish in order to obtain accurate and precise responses and also to avoid any possible language obstacle. The scale was then transformed into Google Forms and was sent to be completed online by the second sample group, which consisted of 496 higher education learners.

2.1. Sampling

The study was conducted with the participation of 554 higher education learners in total formed via convenience sampling method. The inclusion criteria consisted of accessibility, availability at the time of data collection, and consent to participate. For the collection of the data, two different samples were formed. The first sample group consisted of 58 learners at two different state universities while the second sample group involved 496 students at 40 different universities studying at 51 different departments. Both sample groups were previously informed about the research and were invited to participate. The learners who signed the consent form were included in the samples while the necessary ethical permissions were obtained from the Research Ethics Committee of the university.

The first group of participants (n=58) was interviewed previous to the development of the items (indicators of engagement) in order to acquire situational insights into learner engagement. While the extensive review of related research conducted previous to and during the interviews provided theoretical and conceptual perspectives on engagement from various contexts around the world, the data gathered from the interviews with this sample of Turkish higher education

learners enabled us to gain a contextual perspective from learners' own perspectives. The second sample consisted of 496 higher education learners who were asked to complete the questionnaire following the development of the indicators. The majority were females (n=292) while male participants constituted the smaller share (n=204). Their ages varied between 18 and 23.

2.2. Data Analysis

Within the aim to explore the psychometric qualities of the scale, analyses were conducted to find out construct validity, reliability in terms of internal consistency, and item distinctiveness. In order to determine the internal consistency, the Cronbach Alpha method was used as the scale has a five-point Likert design. Item-total test score correlation was calculated to identify the item distinctiveness of the scale. As for construct validity, Explanatory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were conducted. Determining the number of factors is an important decision to make in scale development; thus, in order to determine the number of the factors in this study Horn's Parallel Analysis and MAP (Minimum Average Partial) Analysis were used to guide in identifying the number of factors.

Before conducting the analyses on the data sets, they were analyzed in terms of missing data. As the sets did not have any missing data, no tests were run for missing item issues. The next step involved the identification of outliers. As two participants' responses were found to be outliers, they were excluded from further analyses. Following normality testing of the data sets, the data were analyzed using Lisrel 8.51 Program for CFA and the "psych" package in R program for the other analyses.

It is suggested that the data set obtained from EFA be validated by a different data set, i.e., running EFA and CFA on data gathered from two different groups of samples (Macfarlane et al., 2014). To do this, a large data set could be split randomly into two sets, one of which is used for EFA and the other for CFA. In line with this suggestion, the data set obtained from 496 participants were divided randomly into two sets by including the odd-numbered participants in DataSet1 and the even numbers in DataSet 2. DataSet1 (n=248) was used for EFA while DataSet 2 (n=248) was used for CFA.

3. RESULTS

Previous to EFA analysis, Kaiser–Meyer–Olkin (KMO) Test and Bartlett's Test were run to find out whether the data set was suitable for factor analysis (Table 1).

Table 1. *KMO and Bartlett's test results*.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.911
Bartlett's Test of Sphericity	Approx. Chi-Square	1177
	Degree of Freedom	247
	Sig.	0.000

The results displayed in Table 1 reveal that the data set is suitable for EFA (KMO = 0.911; Bartlett's $df = 247$; $p = 0.00 < 0.05$) as KMO value is above .50 (Pallant, 2001). Therefore, EFA was conducted and a six-dimensional construct was obtained (Table 2).

Table 2. *The results of factors loadings and the total variance explained.*

Factor	Eigenvalue	Variance Explained (%)	Total Variance Explained
Factor 1	9.533	30.752	58.685
Factor 2	2.988	9.640	
Factor 3	2.583	8.331	
Factor 4	1.700	5.485	
Factor 5	1.388	4.477	
Factor 6	0.992	3.201	

Table 2 shows the factors obtained as a result of EFA, the variance explained, and the total variance explained by five factors that loaded greater than 1 eigenvalue and were accepted as valid based on K1 method criteria. For the total variance explained, values between 40 % and 60 % are accepted as ideal. EFA analysis results show that the first five factors explained 58 % of the total variance. When the eigenvalues are analyzed, it can be seen that factor 6 loaded just under 1. Therefore, in order to validate and finalize the number of factors, Horn's Parallel Analysis and Velicer's Minimum Average Partial (MAP) Test were used. These methods are used to identify the number of dimensions of a construct when trying to define it, especially for the first time. In Horn's Parallel Analysis, an artificial data set was generated parallel to the original data set to be analyzed using EFA. After EFA was conducted on both the original and the artificial data sets, the eigenvalues obtained for each factor in the two data sets were compared in order to confirm the number of the factors. Accordingly, the factors in the original data with eigenvalues greater than the corresponding eigenvalues of the parallel data were retained and the number of the factors was confirmed.

Table 3. *The results of Parallel analysis*

	Eigenvalue					
	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Original Data	9.533	2.988	2.583	1.700	1.388	0.992
Parallel Data	1.782	1.621	1.348	1.334	1.217	1.101

According to the results in Table 3, the eigenvalues of the first five factors in the original data set are greater than the ones in the parallel data set. In Factor 6, the eigenvalue of the parallel data is higher than the one in the original data. As a result, the parallel analysis method suggests that the number of factors is five. Table 4 displays the results of MAP Test.

Table 4. *The results of MAP test*.

MAP Criteria					
Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
0.0542	0.3009	0.0286	0.0277	0.0214	0.0298

As shown in Table 4, in line with the results obtained from EFA and, the parallel analysis, MAP test confirm that the scale has five factors with 31 items in total. Out of 45 items in the original scale, 14 were eliminated for statistical reasons such as having less than .30 item correlation, loading under more than one factor at high levels, or having a low item distinctiveness value (Pallant, 2001). Table 5 displays the factors (n=5) and the items (n=31) with their item distinctiveness and loading values in the final version of the scale.

When analyzing data sets using EFA, the Varimax method is used especially when some of the items have high factor loading values to rotate the data and to form the items in groups to constitute different factors. Thus, rotation using the Varimax method was conducted to anchor the loadings of the factors. Item-total test score correlation is conducted to identify the item distinctiveness of the scale (Pallant, 2001). When the value is over .30, an item is considered to have a good distinctiveness value. According to the results displayed in Table 6, item-total test scores of the items in the scale are between 0,303 and 0,711, which indicates that the items have suitable distinctiveness values.

Table 5. *Item distinctiveness and item factor distribution.*

Items	Item Distinctiveness	Factor Loadings				
		Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
I27 I attend my lessons regularly.	.653	.840				
I26 I search for online resources to complete my assignments.	.676	.824				
I31 I complete my assignments on time.	.616	.751				
I29 I follow my teacher's instructions in class.	.678	.670				
I17 I study online to support my lessons.	.627	.606				
I41 I prepare the required materials (e.g., textbooks, tools, etc.) for my lessons before classes start.	.624	.605				
I10 I organize my study environment to concentrate better before starting to study.	.608		.753			
I9 I prepare the necessary lesson materials before starting to study.	.521		.676			
I11 I organize my lesson notes while studying.	.653		.653			
I5 I prepare a study plan before starting to study.	.449		.630			
I12 I try to find links between new learning materials and the previous ones.	.596		.620			
I8 What I learn in my lessons is important for me.	.604		.614			
I4 What I learn in my lessons will be useful for my future career.	.558		.609			
I14 If I have difficulty in understanding the study materials, I try to find alternative ways that can make it easier for me.	.564		.570			
I1 If I miss a class, I study individually to compensate for what I have missed.	.481		.523			
I35 I revise my notes after my classes.	.370			.815		
I30 I study regularly out of class.	.322			.809		
I38 I study regularly for my exams/tests.	.303			.744		
I18 I study regularly not to fall behind my lessons.	.567			.636		
I39 I reread my studying materials whenever I can.	.547			.551		
I42 I attend my classes having completed my assignments and readings.	.545			.815		
I34 I leave the campus as soon as my classes finish.	.711				.801	
I24 I like spending time in the campus.	.381				.776	
I37 I go to the campus only if I have classes.	.380				.738	
I25 I participate in the extracurricular activities (e.g., sports, student clubs, music festivals, etc.) in the campus.	.314				.630	
I23 I feel I belong to my university.	.457				.598	
I15 I come together with my peers to study.	.371					.837
I16 If I have difficulty in my lessons, I ask for help from my friends or teachers.	.539					.835
I22 I like studying with my friends.	.377					.537
I43 I like discussing our lessons performances with my friends and teachers.	.309					.455
I40 We discuss what we learn in our lessons with my friends.	.438					.439

Table 6. *The results for internal consistency of the model and the dimensions.*

Factors		Cronbach Alpha
Factor1	(Academic-Exertive Engagement)	0.887
Factor2	(Metacognitive Engagement)	0.869
Factor3	(Cognitive Engagement)	0.875
Factor4	(Collaborative- Social Engagement)	0.782
Factor5	(Collaborative- Academic Engagement)	0.724
Total Scale		0.870

Table 6 shows that the internal consistency of the whole scale is 0.870 while the values for the factors vary between 0.724 and 0.887, which indicates that the whole scale and the subscales are reliable.

As the final step of the analyses, the five-factor 31-item scale obtained from EFA was tested using CFA. The results were evaluated based on various goodness of fit criteria. Table 7 presents the fit indices of the construct.

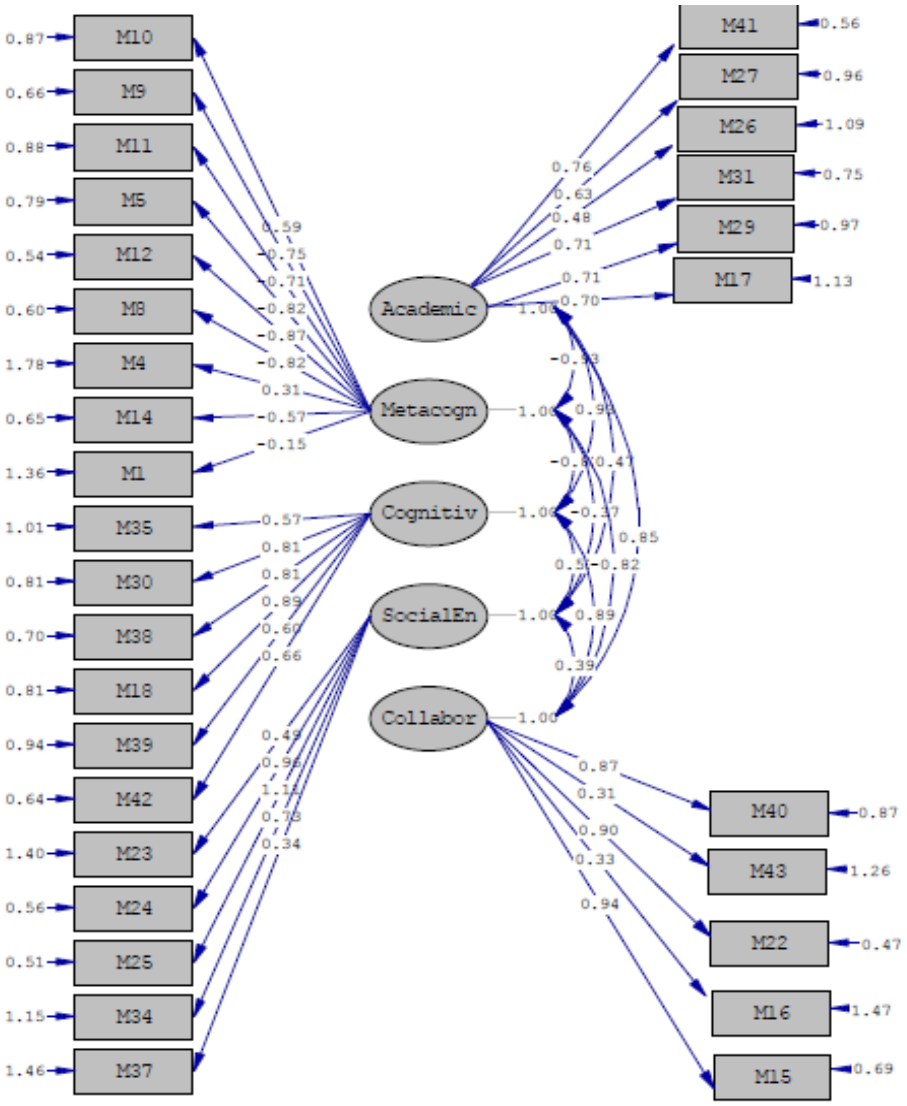
Table 7. *Evaluation of fit indices obtained from CFA.*

Fit Indices		
χ^2 (df)	465 (3)	Acceptable fit
χ^2/df	1.88	Good fit
RMSEA	0.073	Acceptable fit
NFI	0.95	Good fit
NNFI	0.96	Acceptable fit
CFI	0.95	Acceptable fit

The values obtained are within the interval of acceptable fit and good fit (Stevens, 2002). RMSEA value is .073 and the ratio of χ^2 to df is 1.88. The results that the root mean squared error of approximation value is lower than .08 and the ratio of χ^2 to df is lower than 2 indicate a good model fit (Tabachnick & Fidell, 2012). As the majority of the fit indices of the scale show good or acceptable values, the model proposed for higher education learner engagement with five factors is confirmed. The path diagram of the scale obtained from CFA is displayed in Figure 1.

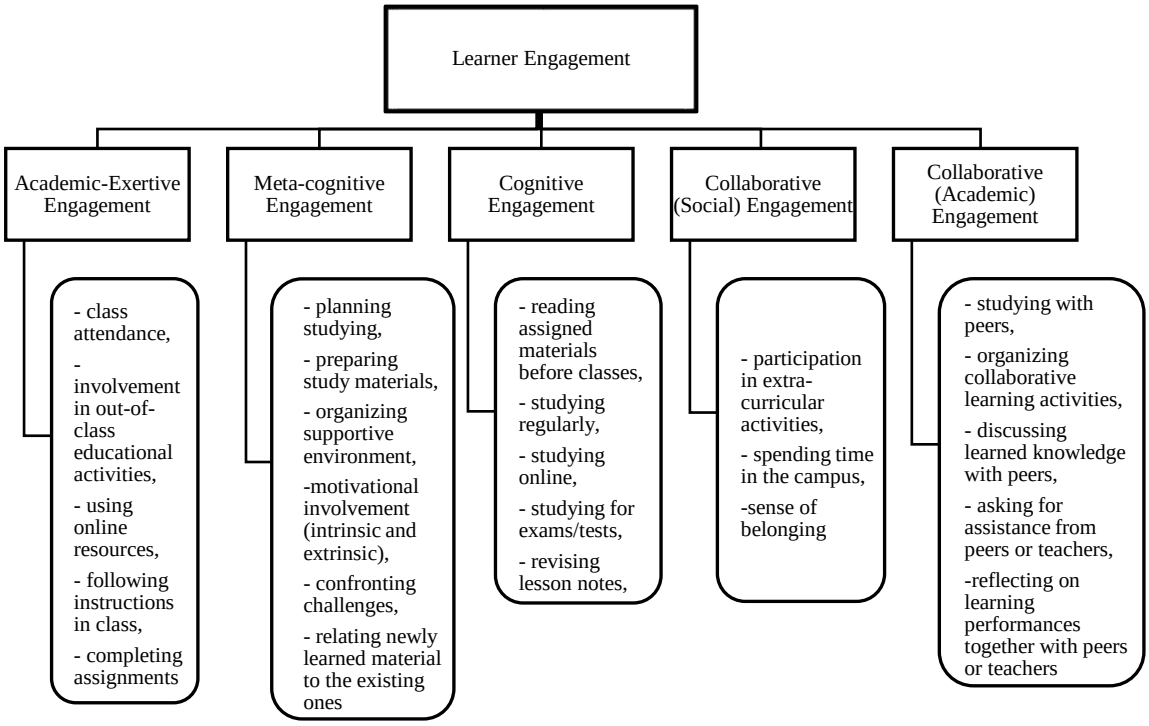
According to the analyses, the psychometric properties of the higher education learner engagement construct revealed a five-dimensional conceptual framework. The model is schematized in Figure 2.

Figure 1. *The path diagram of the model.*



The first dimension "Academic-Exertive Engagement" comprises six items related to class attendance, preparations for lessons, instructions in class, persistence, and completion of assignments. "Metacognitive Engagement", the second dimension, has nine items related to meta-cognitive efforts such as preparing a study plan, having intrinsic and extrinsic motivation, or compensating for missed classes. Another six items formed "Cognitive Engagement" dimension and addressed different cognitive efforts such as studying regularly or revising lesson notes. While the "Collaborative (Academic) Engagement" dimension included items related to academic social gatherings such as studying with peers or organizing collaborative learning activities, the fifth dimension "Collaborative (Social) Engagement" are towards behavioral or emotional social involvement in campus life.

Figure 2. *The representation of the five-dimensional learner engagement conceptual model*



4. DISCUSSION and CONCLUSION

The present study attempted to develop a situated model that can guide measuring higher education learners' engagement levels. To this end, the results of this study regarding the initial model construction and validation have yielded a five-dimensions including academic-exertive, cognitive, meta-cognitive, collaborative-social, and collaborative-academic dimensions of learner engagement at higher education level.

The first dimension comprises six items related to "Academic-Exertive Engagement", where learners' behavioral efforts towards educational activities and tasks are grouped. A significant number of models proposed for learner engagement construct incorporate behavioral component (e.g. Appleton et al., 2006; Finn & Zimmer, 2012; Fredricks et al., 2004). Yet, the conceptualization of behavioral component in the models proposed and its indicators included in the measurement tools vary considerably. From a broader perspective, the behavioral dimension is considered to encompass all efforts exhibited in school and towards school work such as attending classes, spending time on tasks, taking an active part in lessons, persistence, participation in academic and out-of-class educational activities as well as in extra-curricular activities (e.g. Appleton et al., 2006; Fredricks et al., 2004). Although some models distinguish between the efforts spent on actual educational tasks like completing assignments or showing persistence in study and the ones devoted to non-academic tasks such as participation in social activities or taking part in student-clubs (Finn & Zimmer, 2012), these indicators are still considered to be within behavioral engagement dimension. The model proposed by Reschly and Christenson (2006), on the other hand, includes efforts spent for academic tasks such as homework completion under academic engagement and categorizes other efforts such as attendance and extracurricular participation under behavioral engagement. In the model proposed in this research, however, academic-functional dimension covers the efforts energized and/or exhibited directly towards academic work, i.e., completing assignments, attending classes, active class participation, using online resources, preparing for lessons, and persistence. Other efforts such as participation in extra-curricular or social activities are grouped under Collaborative- Social Engagement dimension.

The second emerging dimension is "Cognitive Engagement" with six indicators related to cognitive involvements. These are revising notes, studying regularly out-of-class, studying online, trying to keep up with lessons, reading assigned materials, and studying for exams/tests. The indicators in this dimension are related to self-regulation cognitive strategies that are used to learn, process, understand, and remember learning materials.

Within the theoretical frameworks for self-regulation, cognitive regulation has been reported to significantly correlate with engagement (e.g., Cleary & Zimmerman, 2012; Cobos & Ruti-Garcia, 2021). However, cognitive engagement is frequently used to refer "… to the extent and consumption of an intellectual effort that students spent in learning projects (e.g. students' efforts to incorporate the new knowledge into previously well-known patterns and guide their understanding from a study through the use of cognitive and metacognitive strategies)" (Pellas, 2014, 159). According to this conceptualization, cognitive involvement entails not only the execution of intellectual efforts via utilizing cognitive strategies but the use of meta-cognitive strategies as well. For some models, cognitive engagement indicators also include psychological states or involvement such as motivation or expectation or connecting learning with personal experiences (Kahu, 2013; Pellas, 2014). Furthermore, extra cognitive efforts displayed are considered to be cognitive engagement indicators as well (Finn & Zimmer, 2012). In fact, Zhoc et al. (2019, 225) emphasizes a distinction between academic engagement, which involves "… behaviors exhibited to achieve a minimal 'threshold' level of learning …" and cognitive engagement, which "… refers to an internal investment of cognitive energy to attain more than a minimal understanding of the course content". In other words, efforts displayed to achieve regular or 'minimal' learning requirements are indicators of academic engagement whereas efforts to go beyond minimal requirements and to extend learning by facing challenges and enduring learning commitments are accepted to be indicators of cognitive engagement. However, the model fails to clearly explain what is 'minimal' and what is 'beyond minimal' when it comes cognitive involvement. For example, reading an assigned article could be an easy task for some higher education learners who read such articles regularly and are extremely interested in the topic whereas for other learners who may do better when learning audio-visually or who are not interested in the topic, this task could be quite challenging. Basing cognitive regulation and cognitive strategy use categorization on "easy or complex" tasks would depend on multiple factors such as the specific learner or the duration for assignment completion, etc. For example, the study conducted by Aubrey et al (2020) shows that learners reported higher engagement levels towards easier and more familiar speaking tasks while having lower levels of engagement for unfamiliar tasks or topics. Other studies also report that learners may exhibit different levels of task engagement depending on the task characteristics (Butler, 2017). In the present model, all engagement indicators referring to the exertion of cognitive effort, however simple or complex the cognitive involvement may be, have loaded significantly under cognitive engagement as a distinct factor from meta-cognitive engagement. Also, the findings indicated that indicators of motivational engagement are related to meta-cognitive engagement, rather than belonging to cognitive engagement or forming a separate factor.

"Metacognitive Engagement" formed the third dimension within the construct with nine items related to meta-cognitive efforts activated for learning. Three sub-categories can be found under this dimension: (a) preparative meta-cognitive involvement such as preparing a study plan, or a supportive learning environment, (b) motivational involvement including intrinsic and instrumental motivation, and (c) confronting challenges - persistence such as trying to find alternative ways to learn difficult materials or compensating for missed classes. Although previous studies have indicated that metacognitive involvement is correlated with engagement and has a significant role in predicting learner achievement (Caroll et al., 2021; Hiver et al., 2020; Pellas, 2014), meta-cognitive indicators did not form a distinct dimension in the previous

models. Similar indicators have been included in the models and the scales proposed for learner engagement, however, rather than being grouped under a single dimension, these indicators were included in affective (e.g., Kahu, 2013), or in behavioral dimension (e.g., Appleton et al., 2006). For example, in the model developed by Martin (2008), persistence, planning, and study management were three different factors out of 11 dimensions while in the model developed by Appleton et al. (2006), extrinsic motivation was shown to be a separate dimension in learner engagement. The findings in this study, on the other hand, indicate that meta-cognitive engagement is a distinct dimension in the construct including indicators for motivational engagement, preparatory meta-cognitive engagement, and persistence.

The items under the fourth dimension "Collaborative - Academic Engagement" are mostly related to socially shared learning efforts with peers or teachers such as studying with peers or organizing collaborative learning activities, discussing learned knowledge with peers, asking for assistance from peers or teachers, and discussing learning performances with peers or teachers. As the last dimension, "Collaborative-Social Engagement" includes behavioral and emotional involvement in social life on campus such as participation in extra-curricular activities, spending time on campus, and feeling a sense of belonging to the university. Although the last two factors could form a single strand under the "social" dimension, the analyses indicated that they are distinctive properties and that the Turkish higher education context may require a distinction among collaborative engagement indicators as being academically driven or socially (non-academically) driven. The reason for attaining different categorizations in the properties of engagement construct, as Appleton et al. (2006) state, should be the differences in the sample that provided the data and the context. This finding highlights the significant role of contextual factors on engagement, as frequently emphasized in recent research on learner engagement (Aubrey et al., 2020; Sato & Storch, 2020; Sun et al., 2020; Zhang, 2022). Social interaction is highly valued in Turkish culture (Şişman & Turan, 2004) and higher education Turkish learners are found to be keen on working collaboratively for academic tasks (Taşdemir & Yıldırım, 2017) and therefore, being engaged in academic activities could be cohesive to social involvement.

In conclusion, the previous conceptualizations of engagement include indicators either mainly related to informal social involvement such as participation in social activities or interactions with socialization agents on campus or directed solely towards academic interactions such as discussing grades with teachers (e.g., Finn & Zimmer, 2012). The model proposed by Zhoc et al. (2019), on the other hand, includes two sub-categories under the social dimension with indicators for both formal/academic involvements and informal involvements. These two sub-categories are distinguished based on the involved parties in the interactions: Social Engagement with Peers (i.e., informal interactions with peers both in academic and social spheres) and Social Engagement with Teachers (i.e., interactions with academic staff within academic spheres). However, the model obtained in this study indicates a distinction based on the nature of the interaction: social involvement directed towards academic-collaborative activities like studying with peers and social involvement in non-academic activities such as participation in extra-curricular activities in the campus.

Research on learner engagement is particularly vital for higher education institutions in order to optimize learning conditions and opportunities as well as being able to retain the students they already have (Deng et al., 2020; Padilla Rodriguez et al., 2020; Zepke, 2014). However, assessing learner engagement requires defining the construct accurately by considering contextual factors. Assuming that all learners possess similar qualities and exhibit similar behaviors and dispositions across different contexts has led to the misassumption that a single engagement scale could be used for any given context, which also overlooks the interrelated dynamic dimensions of the engagement construct (Aubrey et al., 2020; Kahu, 2013; Zhang,

2022). A considerable majority of the research findings so far point out that engagement is a "meta-construct" embodying multiple constructs (e.g. Zhoc et al., 2019). Determining what these constructs are and understanding how they interrelate with each other will likely to expand our understanding of learner engagement while contributing to the development of engagement pedagogy.

The overall findings of the study indicate two important suggestions to consider when measuring learner engagement. First, since understanding learners and the diverse properties they possess require an extensive consideration of contextual factors and the situated nature of learner behaviors, both contextual and individual factors interacting and shaping learner engagement should be acknowledged. As Zepke (2014, 704) states, "… engagement is more than a 'one size fits all' set of 'how to' suggestions". The findings of the present study suggest that metacognitive engagement, which conveys a significant number of engagement indicators that are closely related to contextual factors, forms an integral dimension in engagement construct.

Secondly, the multidimensional nature should be recognized in structuring the concept while accounting for the dynamic interrelation among diverse dimensions (Glanville & Wildhagen, 2007). Rather than trying to draw sharp lines between these dimensions and trying to categorize specific indicators under them, categorizations with broader scopes for each dimension that allow modifications depending on the context at hand could be proposed. This could be achieved by developing an overarching model for engagement in order to have a better understanding of the construct and its role in learning.

The present study is not without limitations. Firstly, the results presented rely on learners' self-reports and thus, the implications cannot be generalized to the whole population. The model and the tool proposed are subject to further validation through mixed methodological approach. This might entail including in-depth learner perspectives obtained through observations and/or interviews as well as the perspectives of other parties involved in the learning process such as teachers, peers, or administrators. Such a broader scope is expected to yield in more valid results advancing the efforts to understand engagement construct. Also, the model presented includes limited number of indicators for online learner engagement. As online learning has become an integral part of higher education, particularly since the onset of Covid-19 pandemic, the use of digital technologies in education need to be considered as a central part of learner engagement (Deng et al., 2020; Zhoc et al., 2019). Thus, more online engagement indicators should be included in further research conducted to develop models and measurement tools for learner engagement.

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Declaration of Conflicting Interests and Ethics

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Orcid

Meral Şeker https://orcid.org/0000-0001-7150-4239

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APPENDIX

Learner Engagement Scale (Turkish)

AKADEMİK KATILIM ÖLÇEĞİ

Sevgili Öğrenciler,

Bu anket akademik çalışmalarınızdaki akademik katılım seviyenizi ölçmek için hazırlanmıştır. Çalışmaya katılım gönüllülük esasına dayalıdır. Katkılarınız için teşekkür ederiz.

A. Kişisel Bilgiler

1. Cinsiyetiniz
   - o Kadın
   - o Erkek
   - o Söylememeyi tercih ediyorum
   - o Diğer:

2. Yaşınız
   - o 17 - 19
   - o 20 - 25
   - o 26 - 30
   - o 31 +

3. Bölümünüz ……..

B. Akademik Katılım Maddeleri

Lütfen aşağıdaki ifadeleri dikkatli okuyun ve size en uygun seçeneği işaretleyin.

1. Her zaman **2.** Sık sık **3.** Bazen **4.** Nadiren **5.** Hiçbir zaman

No	Ölçek Maddeleri	1	2	3	4	5
1	Eğer bir dersime katılamazsam, o derste kaçırdığım konuları öğrenmek için kendim çalışırım.					
2	Derslerde öğrendiklerim gelecekteki kariyerim için önemlidir.					
3	Ders çalışmaya başlamadan önce kendime bir çalışma planı hazırlarım.					
4	Derslerimi desteklemek için online (çevrimiçi) çalışırım.					
5	Derslerde öğrendiklerim benim için önemlidir.					
6	Ders çalışmaya başlamadan önce gerekli çalışma materyallerini hazırlarım.					
7	Daha iyi yoğunlaşabilmek için, ders çalışmaya başlamadan önce çalışma ortamımı düzenlerim.					
8	Ders çalışırken ders notlarımı düzenlerim.					
9	Yeni öğrendiklerim ile daha önce öğrendiklerim arasında ilişki kurmaya çalışırım.					
10	Çalışma konularını anlamakta güçlük çekersem, anlamamı kolaylaştıracak alternatif yollar ararım.					
11	Arkadaşlarımla ders çalışmak için bir araya gelirim.					
12	Derslerimde güçlük çekersem, arkadaşlarımdan veya öğretmenlerimden yardım isterim.					
13	Derslerimde geri kalmamak için düzenli olarak ders çalışırım.					
14	Arkadaşlarımla birlikte ders çalışmayı severim.					
15	Kendimi üniversiteme ait hissederim.					
16	Kampüste vakit geçirmek hoşuma gider.					

17	Kampüsteki müfredat dişi etkinliklere (örneğin spor, öğrenci kulüpleri, müzik festivalleri, vb.) katılırım.					
18	Ödevlerimi tamamlamak için çevrimiçi kaynaklar ararım.					
19	Derslerime düzenli olarak katılırım.					
20	Derslerde öğretmenlerimin açıklamalarını takip ederim.					
21	Okul dışında düzenli olarak ders çalışırım.					
22	Ödevlerimi zamanında tamamlarım.					
23	Derslerim biter bitmez kampüsten ayrılırım.					
24	Derslerden sonra ders notlarımı gözden geçiririm.					
25	Kampüse sadece derslerim için giderim.					
26	Sınavlarıma düzenli olarak çalışırım.					
27	Her müsait olduğum zaman ders notlarımı tekrar gözden geçiririm.					
28	Arkadaşlarımla derslerde öğrendiklerimiz üzerine konuşuruz.					
29	Dersler başlamadan önce gerekli ders materyallerini (örneğin ders kitapları, ders araçları, vb.) hazırlarım.					
30	Derslere ödevlerimi ve okumalarımı tamamlamış olarak katılırım.					
31	Arkadaşlarım ve öğretmenlerimle derslerdeki performanslarımız üzerine konuşmayı severim.					