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The adaptation of student engagement scale in higher education (HES)

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Abstract

The aim of this study is to adapt the Student Engagement Scale into Turkish higher education context. The scale has two previous versions whose aims are to determine the level of engagement of students studying at different universities (American-Canadian & Australian-New Zealand). Both scales provide significant benefits related to the quality of higher education regarding both students' achievement high-quality learning outcomes and the development of universities regarding various aspects. In the current study, the scale called the Turkish Higher Education Student Engagement Scale (HES) was adapted from the Australasian version called SES2 so that the quality in higher education in Turkey can be achieved in a similar fashion. During the adaptation process, two data sets obtained from totally 526 students studying at a state university in Turkey were used. The first data set was used for both the explanatory factor analysis (EFA) and confirmatory factor analysis (CFA), respectively. The second data set was used for another CFA to prove its validity on the second dataset. It reveals that the scale has a structure of seven sub-factors, which is different from the previous versions. The scale provides valuable information regarding the determination of students' level of engagement in higher education in both western countries and Turkey.

Keywords: Students' engagement; higher education; quality standards of engagement

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1. Introduction

1.1. Introduction to the problem

'*Student engagement*' is a noteworthy interest in the literature, based on Alexander Astin's work on '*student involvement*' (Astin, 1975; Astin et al., 1984). Following '*the student experience*' and '*research-based teaching*', '*student engagement*' has become the main theme of meeting agendas and has become the focus of many conferences in order to improve learning and teaching in higher education worldwide. It is not difficult to understand that there is a sound literature on '*student engagement*' due to the positive results of student achievement and development, such as persistence, academic success and social involvement (Astin et al., 1984, 2003; Chickering and Gamson, 1987; Pascarella and Terenzini, 1991, 2005; Pace, 1995, 1998), and that it is a strong association with a subset of educational activities. Moreover, increasingly sophisticated economic conditions of higher education institutions have become more important than ever. The primary role of universities has evolved; in that, they should attract and keep students in school; moreover, they should ensure that students are satisfied. In addition, they should develop students as productive citizens, and thus enabling their graduation as well as being successful further in life. As Magolda (2005) states what students add higher education or where they study is less important than their achievements and their development as a student. If student engagement can fulfill its promises, it is likely to be the most important factor that makes all of it possible. It is essential that sophisticated knowledge societies are aimed at having more people involved in higher education and guiding them in ways that produce high-quality results. The welfare of each country depends on the quality of education they provide, so the development of universities should be supported from every perspective. This study provides the opportunity to evaluate and respond to all the important dynamics, limitations and opportunities that exist in universities. Besides, it stimulates evidence-based findings of students' participation in activities and conditions where empirical research is linked to high-quality learning and development. However, the main problem is how to determine the students' engagement. Therefore, there is to be a consensus as to how to determine the level of students' engagement through a reliable process. In order to measure the students' engagement in the educational processes, student engagement scale - SES (Coates, 2009, pp. 62-63) have been implemented in various developed countries such as Canada, USA, Australia and New Zealand. The main goal of the current study is to adapt the scale called "Students' Engagement Scale" into Turkish higher education context.

1.2. Background of Student Engagement and Student Engagement Scale (SES)

'Student Engagement' has been defined by various scholars in a similar fashion; to illustrate, it has been defined by Karause and Coates as '*the extent to which students are*

engaging in activities that higher education research has shown to be linked with high-quality learning outcomes' (Krause and Coates, 2008, p.493). According to Kuh and Hu (2002) student engagement has been defined as '*the quality of effort students themselves devote to educationally purposeful activities that contribute directly to desired outcomes*' (p.555). In a similar fashion, engagement has been defined as '*participation in educationally effective practices, both inside and outside the classroom, which leads to a range of measurable outcomes*' (Kuh et al., 2007). However, unlike definitions given above, it was defined by Little et al. (2009) that '*the role of students in the process of shaping the student learning experience through formal institutional processes for assuring and enhancing the quality of learning and teaching, and more informal mechanisms*' (p.11). The two abovementioned approaches have been combined by Kuh (2009) and the researcher has defined it as '*the time and effort students devote to activities that are empirically linked to desired outcomes of college and what institutions do to induce students to participate in these activities*' (p.9)

According to Coates (2007, 122), engagement is '*a broad construct intended to encompass salient academic as well as certain non-academic aspects of the student experience*'. In the National Survey of Student Engagement (NSSE, 2008), the SES_1 (American & Canadian version) consists of five different sub-scales called "active and collaborative learning", "participation in challenging academic activities", "formative communication with academic staff", "involvement in enriching educational experiences" and "feeling legitimated and supported by university learning communities" (p.8). The SES_1 is based on these aspects, it is a tool which is conducted annually among public and private higher education institutions in both the US and Canada. The benchmarks of the structures of each sub-scales in the SES_1 are illustrated in Table 1.

Table 1. *The Benchmarks of the Structures of each Sub-scale in the SES_1 (American Version)*

Sub-scales	Benchmark of the structures
Academic Challenge	*Extent to which expectations and assessments challenge students to learn*
Active Learning	*Students' efforts to actively construct their knowledge*
Student and Staff Interactions	*Level and nature of students' contact with teaching staff*
Enriching Educational Experiences	*Participation in broadening educational activities*
Supportive Learning Environment	*Feelings of legitimation within the university community*

On the other hand, (AUSSE), the SES_2 (Australasian version) is the modified version of the SES_1, added through an additional sixth sub-scale called "work-integrated learning" (Coates, 2009, pp. 62-63). The benchmark of the added structure of the SES_2 is associated with "integration of employment-focused work experiences into study" (Coates, 2010, p.4), which is likely to generate high-quality learning.

2. Method

The aim of this study is to adapt the SES2 version of AUSSE into Turkish higher education context, which is called the Turkish Higher Education Student Engagement Scale (HES). The SES2 version of AUSSE has six sub-scales with totally 47 items and their distribution is given in Table 2.

Table 2. *Distribution of Items in each Sub-scale in the SES₂ (Australasian Version)*

Sub-scales	Number of Items
Academic Challenge	11
Active Learning	7
Student and Staff Interactions	6
Enriching Educational Experiences	12
Supportive Learning Environment	6
Work Integrated Learning	5
Total	47

- Based on the aim, the following procedure was utilized during the adaptation process.

The items in SES2 were translated into Turkish by three experts (Ph.D.) in translation. The Turkish version of the items was checked by three Turkish language experts (Ph.D.) and some corrections were made accordingly. Then, the Turkish version of the items was back-translated by other three experts (Ph.D.) into English in order to compare with the original form, which indicated that there were no differences with the original one.

- The questionnaire format of the original scale was designed (HES).

The participants were students studying at a big state university (with 30.000 students) located in the Central Anatolia. The sample of participants was selected randomly amongst those who participated (n=552) in the study in a voluntary manner. Following the consent of the participants, they were informed of the HES and trained as to how they were to answer the items, each of which was explained in details within a fifty-minute period.

- The data obtained from the participants (n=552) were checked in terms of unengaged responses and outlier values.

During the process of checking, 19 participants left more than half of the items, 4 participants marked the entire items with such scores as 1 and 3 participants marked the items as 5. Therefore, totally 26 participants' datasets out of 552 were excluded from the whole dataset, which revealed that 526 datasets were left. In this study, there was a two-stage analysis process conducted; therefore, the dataset (n=526) was divided by 2 equaled 263. According to Tabachnick and Fidel (2013) unequal sample sizes in each cell create difficulty in computation and ambiguity of results (p.48), whereas unequal sample sizes reduce power while equal sample sizes increase it (p.543). The obtained groups were regarded as sub-groups (see Table 3).

Table 3. *Purpose of Division and the Dataset*

Dataset Group	n
Group-1 (For EFA & CFA)	263
Group-2 (For CFA only)	263
Total	552 (Female: 116; Male:410)

- CFA with the dataset called Group-1 was conducted on the HES. The CFA results showed that the index values of the scale were not fit.

EFA with the dataset called Group-1 was conducted on the HES. Some of the items were removed from the HES and the new factor structure was created. CFA was conducted on the dataset called Group-1 and the structure of the HES was fitted.

- A new CFA was conducted on the dataset called Group-2 and the factor structure of the HES was fitted on a different dataset.
- Finally, the Cronbach's alpha scores of the sub-scales and the HES were calculated.

3. Results

The obtained results of the steps followed during the process regarding EFA & CFA analysis along with Cronbach's alpha scores of the HES as given in the bulletin were presented and the details of findings are given as in the following:

EFA and CFA results of group-1 dataset

In order to determine the theoretical structures of the original scale, a CFA was conducted on the dataset called Group 1. CFA results showed the that the index values of the scale were not fit. In this context, an EFA was conducted on the dateset called Group-1 to determine the theoratical structure of the HES in Turkish context. In the EFA process, to extract the factors, principal component method was applied in order to discover which variables in the set form coherent subsets that were relatively independent of one another in Turkish context as well as promax rotation [oblique], in which the factors are correlated indicating that the meaning of factors is ascertained from the pattern matrix (Tabachnick & Fidell, 2013, pp.612-614). Moreover, in order to determine the number of factors, the lower bound of the eigenvalues was limited to 1.00, and as proposed by Field (2005), the factor loading lower bound was limited to 0.40. Also, the determination of the sampling and data matrix adequacies Kaiser–Meyer–Olkin (KMO) and Bartlett's Test of Sphericity (BTS) values were calculated. The results are given, respectively; KMO=.907; BTS values were [Chi square = 38791.033; df = 528; p = .000], indicating an appropriate structure for applying EFA (Tabachnick & Fidell, 2013, pp.619-620).

Based on the EFA analysis, seven sub-scales were found apart from the sub-scales (six sub-scales) of SES_2, an additional sub-scale was determined in the HES, which is given in Table 4 in details.

Table 4. *The Comparison of the Sub-scales of the SES_2 and HES*

SES_2		HES	
Sub-scales	No of Items	Sub Scales	No of Items
Academic Challenge	11	Academic Challenge	7
Active Learning	7	Active Learning	5
Student and Staff Interactions	6	Student Lecturers' Interactions	4
Enriching Educational Experiences	12	Enriching Interactions	3
		Extensive Study, Activity and Expertise	4
Supportive Learning Environment	6	Supportive Learning Environment	5
Work Integrated Learning	5	Work Integrated Learning	5
Total	47	Total	33

All sub-scales but one had no match with those in the SES_2. "Enriching Educational Experiences" sub-scale in the SES_2 emerged two different sub-scales as "Enriching Interactions" and "Extensive Study, Activity and Expertise" in the HES. Besides, 14 items were excluded from the SES_2 and the remaining 33 items were in the HES. Total variance, factor loads, the statistical values obtained from EFA and factor correlations are given in Table 5, Table 6 and Table 7, respectively.

Table 5. *Results of total variance (Promax rotation)*

Factor	Eigen values	Percentage of variance	Cumulative variance
Academic Challenge (AC)	10.546	31.958	31.958
Work Integrated Learning (WIL)	2.289	6.936	38.894
Supportive Learning Environment (SLE)	1.901	5.762	44.656
Active Learning (AL)	1.561	4.731	49.386
Student Lecturers' Interactions (SLI)	1.422	4.310	53.696
Extensive Study, Activity and Expertise (ESAE)	1.315	3.983	57.679
Enriching Interactions (EI)	1.068	3.235	60.914

Table 6. *Factor and item statistics of the HES (33 items)*

Factor	Item	Means ($\bar{X}$)	sd	Item-total correlation[a]	Communality estimates	Rotated item load
	n=7 items; Cronbach's Alpha = .840					
AC	AC38-1	2.39	.858	.508	.687	.800
	AC39-2	2.42	.852	.561	.654	.744
	AC40-3	2.39	.910	.501	.511	.570
	AC41-4	2.33	.824	.535	.494	.589
	AC42-5	2.28	.906	.521	.488	.612
	AC46-6	2.34	.877	.484	.623	.772
	AC47-7	2.38	.932	.450	.490	.702
	n=5 items; Cronbach's Alpha = .852					
WIL	WIL32-8	2.11	.941	.531	.631	.725
	WIL33-9	2.21	.834	.517	.676	.824
	WIL34-10	2.24	.779	.562	.646	.770
	WIL35-11	2.03	.939	.551	.658	.790
	WIL36-12	2.31	.861	.538	.658	.784
	n=5 items; Cronbach's Alpha = .838					
SLE	SLE27-13	2.14	.860	.539	.556	.543
	SLE28-14	1.93	.817	.602	.616	.566
	SLE29-15	2.06	.887	.583	.741	.840
	SLE30-16	2.13	.917	.546	.693	.820
	SLE31-17	2.24	.945	.515	.615	.755
	n=5 items; Cronbach's Alpha = .772					
AL	AL1-18	2.25	.795	.508	.577	.720
	AL2-19	1.96	.909	.539	.667	.643
	AL3-20	2.34	.910	.460	.551	.723
	AL4-21	2.46	.907	.444	.495	.651
	AL7-22	2.16	.901	.521	.523	.623
	n=4 items; Cronbach's Alpha = .842					
SLI	SLI8-23	2.00	.854	.584	.611	.700
	SLI9-24	2.00	.953	.612	.661	.745
	SLI10-25	2.08	.944	.631	.685	.703
	SLI11-26	1.93	.924	.636	.683	.735
	n=4 items; Cronbach's Alpha = .739					
ESAE	ESAE17-27	2.15	1.01	.559	.608	.595
	ESAE18-28	2.00	.931	.546	.626	.638
	ESAE21-29	1.71	1.03	.427	.638	.770
	ESAE22-30	1.90	.892	.563	.522	.542
	n=3 items; Cronbach's Alpha = .661					
EI	EI15-31	2.42	.900	.420	.606	.739
	EI16-32	2.60	.900	.338	.585	.767
	EI25-33	2.27	.990	.431	.627	.683
Whole Scale	n=33 items; Cronbach's Alpha = .932					

[a]Correlation is significant at the .01 level

Table 7. *Factor Correlations*

Factor	AC	WIL	SLE	AL	SLI	ESAE	EI
AC	1.000						
WIL	.456	1.000					
SLE	.397	.367	1.000				
AL	.375	.424	.410	1.000			
SLI	.434	.393	.515	.479	1.000		
ESAE	.303	.373	.379	.418	.403	1.000	
EI	.364	.344	.270	.240	.237	.159	1.000

Depending on the results presented above, some certain factor structures emerged in order to determine whether these structures were validated or not, a CFA was conducted based on the same dataset (Group-1). The CFA results of the HES structure is presented in Figure 1.

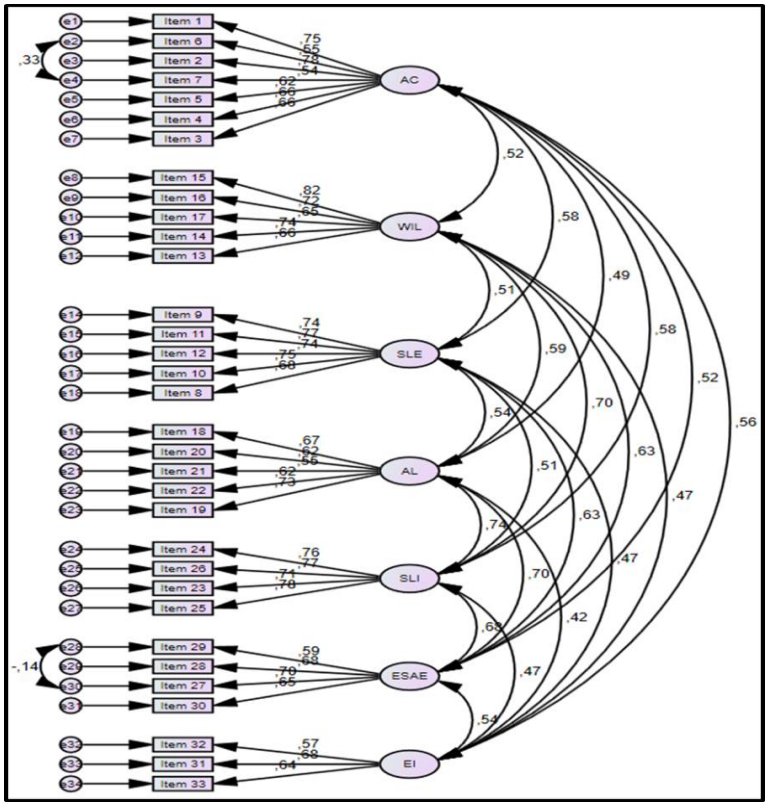

Figure 1. The CFA structure of the HES (Group-1 dataset)

The CFA results, conducted by means of Analysis of Moment Structures (AMOS) software, revealed that the seven-factor structure of the HES was confirmed; meanwhile, there were two covariance corrections in the structure. Moreover, the index values obtained from the CFA analysis such as CMIN/DF=1.621 (good fit; Bryne, 2010; Schermelleh-Engel et al, 2003; Shumaker & Lomax, 1996); RMR=.044 (good fit; Bryne,

2010; Schermelleh-Engel et al, 2003; Shumaker & Lomax, 1996), SRMR=.05 (good fit; Bryne, 2010; Schermelleh-Engel et al, 2003; Shumaker & Lomax, 1996), GFI=.86 (acceptable fit; Bryne, 2010; Schermelleh-Engel et al, 2003; Shumaker & Lomax, 1996), RMSEA=.049 (good fit; Bryne, 2010; Schermelleh-Engel et al, 2003; Shumaker & Lomax, 1996), which shows that the seven-factor structure of the HES was verified.

CFA results of group-2 dataset

A new CFA analysis was conducted for the second time in order to determine whether the seven-factor structures of the HES, whose EFA and CFA analysis were conducted with Group-1 dataset, would be verified with a different dataset called Group-2. Meanwhile, there was one covariance correction in the structure. Moreover, the same index values obtained from the second CFA analysis such as CMIN/DF=1.407 (good fit; Bryne, 2010; Schermelleh-Engel et al, 2003; Shumaker & Lomax, 1996); RMR=.042 (good fit; Bryne, 2010; Schermelleh-Engel et al, 2003; Shumaker & Lomax, 1996), SRMR=.047 (good fit; Bryne, 2010; Schermelleh-Engel et al, 2003; Shumaker & Lomax, 1996), GFI=.87 (acceptable fit; Bryne, 2010; Schermelleh-Engel et al, 2003; Shumaker & Lomax, 1996), RMSEA=.039 (good fit; Bryne, 2010; Schermelleh-Engel et al, 2003; Shumaker & Lomax, 1996), which verified the seven-factor structure of the HES. The CFA structure of the HES (Group-2 dataset) is given in Figure 2.

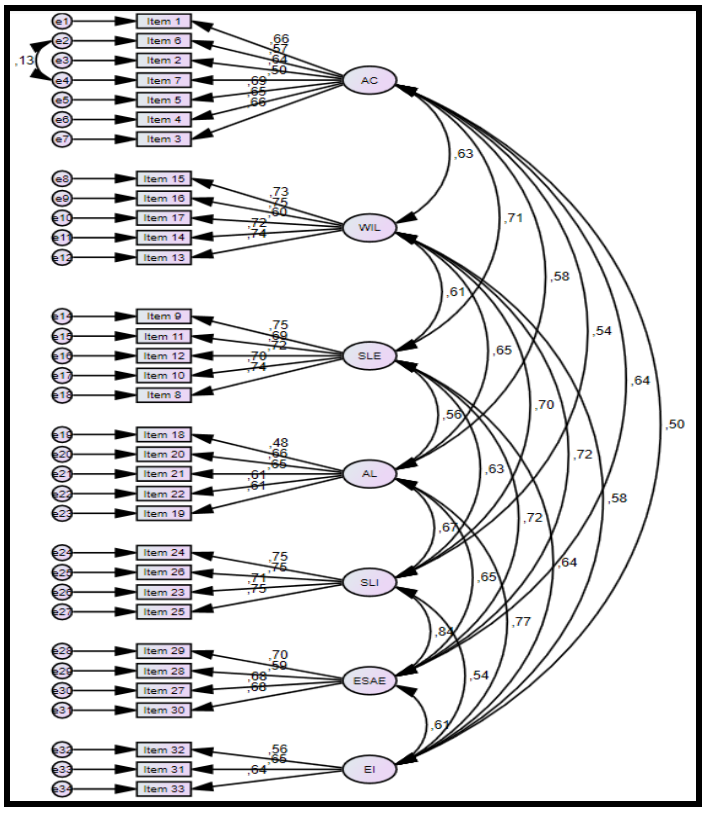

Figure 2. The CFA structure of the HES (Group-2 dataset)

As a final stage of the statistical analysis process, the Cronbach's alpha scores of the sub-scales and the HES were calculated (Group-2 dataset). The results are given in Table 8.

Table 8. *Cronbach's alpha scores (group-2 dataset)*

	AC	WIL	SLE	AL	SLI	ESAE	EI
Cronbach's Alpha	.829	.841	.822	.749	.835	.720	.659
Whole Scale				.921			

4. Discussion and Conclusions

The original version of the scale called SES_1 has five independent sub-scales and it has been used in the USA and Canada. Moreover, the Australian version of the scale called SES_2, which was adapted from the SES_1, has six independent sub-scales. In the study, the scale called HES, which was adapted from the SES_2 into Turkish context, has seven independent sub-scales. Considering SES_1 and SES_2, the HES is discussed regarding each sub-scales and the details as given below.

The first sub-structure in the HES is hailed as Academic Challenge (AC), which aims to determine the extent to which expectations and assessments challenge students to learn. Namely, during educational processes, students encounter several challenges that they are supposed to handle. This structure includes students' self-evaluation as to what they learn during their educational processes in terms of course based aspects in particular. To illustrate, they could organize the ideas and thoughts they have gained during the lectures as well as having the skills to apply theories and new concepts. This sub-scale also exists in both SES_1 and SES_2, which is to be highlighted. However, this structure in the SES_2 has 11 items, whereas the HES has seven items. The items omitted in the HES are related to written assignments and workload regarding lecturers' expectations and standards are not available in the Turkish higher education context. Therefore, the items are omitted in the HES, despite their existences in the SES_2.

The second sub-structure in the HES is called Active Learning (AL), which aims to determine students' efforts to actively construct their knowledge. In other words, to what extent students are involved in instructional processes in an active manner. In the process, students have the opportunity to work with their counterparts both inside and outside classes regarding participating in academic as well as community-based projects as part of their study. This sub-scale also exists in both SES_1 and SES_2, which is to be highlighted. In terms of the sub-scale, the SES_2 has seven items, whereas the HES has five items. The items in the SES_2 are related to interactivities with other university

students and participation in voluntary projects. The reason why they do not exist in the HES is that there are not adequate inter-university activities among university students except for sports organizations. In addition, the community-based projects are newly emerging approach, thus they have not been standardized amongst universities in Turkey yet.

The third sub-structure in the HES is referred to as Student and Staff Interactions (SLI), which aims to determine the level and nature of students' contact with lecturers. In this sub-structure, students have the chance to discuss their grades or assignments with teaching staff, talked about your career plans with teaching staff or advisors, receive prompt written or oral feedback from tutors on their academic performance and work on a research project with a staff member outside of coursework requirements. This sub-scale also exists in both SES_1 and SES_2, which is to be emphasized. In terms of the sub-scale, the SES2 has six items, whereas the HES has four items. The items in the SES_2 are related to the activities other than coursework or the research projects with staff members outside of coursework requirements. In the Turkish higher education context, such activities are conducted by research assistances, who are regarded as the permanent staff members of the faculty rather than by undergraduate students.

The fourth sub-structure in the SES_1 and SES_2 is called Enriching Educational Experiences, which aims to determine the participation in broadening educational activities. This substructure involves conversations with students of a different ethnic group than their own and with students who are very different in terms of religious beliefs, political opinions or personal values as well as encouraging contact among students from different economic, social and ethnic backgrounds.

Although the sub-structure emerging in the previous versions does not exist in the HES, the sub-structure emerges in the HES has been divided into two different sub-factors called Extensive Study, Activity and Expertise (ESAE) and Enriching Interactions (EI). The former is related to practice, training or internship or fieldwork, voluntary community services, participation in student exchange programs as well as increase in expertise, professional experiences and skills required, whereas the latter is related to conversations with students of a different ethnic group than their own and with students who are very different in terms of religious beliefs, political opinions or personal values as well as encouraging contact among students from different economic, social and ethnic backgrounds.

The fifth sub-structure in the HES is called Supportive Learning Environment (SLE), which aims to determine the feelings of legitimation within the university community. This sub-structure focuses on students' relationships with others such as their peers, teaching staff, administrative personnel and services as well as providing support to succeed academically. SES_2 has six items, while the HES has five items. The item which does not exist in the HES is related to relationships of students with their peers, which is not supported in the Turkish higher education context; rather, students

are encouraged to develop their both academic and non-academic skills individually, which is to be considered as another significant aspect of the scale.

When it comes to the Australian version called SES_2, it has another sub-scale called Work Integrated Learning (WIL), which aims to determine the integration of employment-focused work experiences into the study. The sub-structure involves blended academic learning with workplace experience in order to improve knowledge and skills that will contribute to their employability and explore how to apply their learning in the workforce, industry placement or work experience as well as acquiring job-related or work-related knowledge and skills. The sixth sub-structure emerging both in SES_2 and HES does not exist in SES_1.

All in all, the term of engagement seems to have become popular recently; however, it dates back to Alexander Astin and C. Robert Pace, who both contributed to its definition and measurement of the term. The former Alexander Astin, who also investigated the students' interaction with educational environments in the mid-1970s. Astin developed a concept student *'involvement'*, which is a developmental theory for Higher Education, identifying students' engagement with their academic environment such as their co-curricular activities, having a part-time job on campus or participating in extracurricular programs had a positive effect on their success. On the other hand, he discovered that such activities as living and working full-time off-campus had a negative effect on their success. Therefore, he concluded that the more students engage in the university experience, the more likely they become successful (Astin, 2003, p. 26).

The latter Pace (1998), as a psychologist, focusing on evaluation and measurement, has been mainly testing spans for the last six decades, investigating the impact of university environments on students. He put forward the term *'quality of effort'*, which means that as the students' meaningful engagement increases in an academic environment, their academic success increases accordingly. Moreover, according to Pace, in order for students to achieve their learning goals, certain educational processes and tasks are likely to become more significant than others. To illustrate, students' starting studying at the term and interacting with their peers and scholars and does extra relevant readings are more likely to learn than those starting studying just one day before the exam. Since Pace found the significance of such university facilities as libraries, laboratories, classrooms, residence halls, galleries, called as "behavior settings" which prompted students' specific sorts of involvement in activities, he wanted to learn as to how frequently students visited such facilities through the College Student Experiences Questionnaire (Pace, 1998, p. 29). In addition, Shulman (2004) and Kuh (2007) mention that student involvement is not merely a substitute for learning, but the desired outcome, because it is the pioneer of knowledge and understanding. Therefore, students' engagement involves motivation representing a psychological state, learning environment and on and off-campus practices performed. The HES involves all abovementioned dimensions.

Although the subscale Enriching Educational Experiences exists in both SES_1 and SES_2, the subscale has been divided into two sub-factors as ESAE and EI in the Turkish Higher Educational context. The reason why there are two new sub-factors is that some certain recent concepts such as student exchange programs (e.g. ERASMUS-international and FARABI-domestic) have a deep impact on the practices and structures of the universities in Turkey. Based on these new practices, students have had opportunities to interact with both foreign Turkish students who have different cultural, economic and religious backgrounds.

In the higher educational context, it is thought that there will be two main outcomes related to implementing the scale called HES in Turkey. First, The Higher Education Quality Commission, which was established by The Higher Education Assembly on July 23, 2015, has been inspecting the universities in Turkey in terms of various quality standards, since then. Among those standards, there are student-university integration and student engagement in terms of both academic and administrative contexts. Moreover, the provision of student engagement in Turkish higher education context and the results obtained from the scale may contribute to determining the requirements regarding the developmental processes of all the universities. Then, if the universities in Turkey had the required standards of the HES, there could be a great opportunity for them to attain full integration with western counterparts.

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