Programa de Pós-Graduação em Educação
Universidade do Estado do Pará
Belém-Pará- Brasil

Revista Cocar. V.18 N.36 / 2023. p. 1-14 ISSN: 2237-0315

Are there significant differences in the level of engagement of students who study in the morning and evening shifts?

Há diferenças significativas no nível de engajamento dos alunos que estudam nos turnos matutino e noturno?

Ernandes Rodrigues do Nascimento
Centro Universitário Maurício de Nassau
Paulista-Brasil
Karla Karina de Oliveira Menezes
Instituto Politécnico de Setúbal
Sesimbra-Portugal
Isabel Pauline Lima de Brito
Instituto Federal de Pernambuco
Recife-Brasil

Abstract
This article analyzes whether there are significant differences in the engagement of students who study in the morning and evening shifts. This is a quantitative cross-sectional study with 212 students of the marketing strategy subject in the business administration course of a public institution in Recife-PE. To measure the students' level of engagement, the Student Engagement Scale with the School (EAE) was used. The t-test has showed that there were statistically higher scores on two of the four dimensions (behavior and agentic) among morning and evening students but that the effect size (Cohen's d) was small. The AFM has demonstrated that it could use the EAE scale to make this comparison. The results presented in the article deepen the knowledge about the student engagement of higher education students from a public institution, bringing information regarding the period of the Covid-19 pandemic. The findings can serve as a basis for future research on student engagement.
Keywords: EAE; Student Engagement; Covid-19.

Resumo
Este artigo analisa se há diferenças significativas no engajamento dos alunos que estudam nos turnos matutino e noturno. Trata-se de uma pesquisa quantitativa de desenho de corte transversal com 212 estudantes da disciplina estratégia de marketing, no curso de administração de uma instituição pública localizada em Recife-PE. Para mensurar o nível de engajamento dos estudantes, utilizou-se a Escala de Envolvimento do Aluno com a Escola. O Teste t demonstrou que houve escores estatisticamente maiores em duas das quatro dimensões entre os estudantes matutinos e noturnos, mas que o tamanho do efeito (d de Cohen) foi pequeno. A AFM demonstrou que a escala EAE pode ser utilizada para fazer esse tipo de comparação. Os resultados apresentados no artigo aprofundam os conhecimentos sobre o engajamento estudantil de alunos de curso superior de instituição pública, trazendo informações referentes ao período da pandemia da Covid-19.
Palavras-chave: EAE; Engajamento Estudantil; Covid-19.

Are there significant differences in the level of engagement of students who study in the morning and evening shifts?

1. Introduction

Student engagement has been studied for decades (NASCIMENTO; PADILHA, 2020; 2021). Throughout this period, several ways of measuring the level of student's involvement with the school and their learning were created and tested (FREDERICKS, 2011). Veiga (2013) presents one of the most used scales in Brazilian research to measure or describe student engagement in the most diverse contexts, such as: Learning in multitasking environments. A reality in Maker Culture (NASCIMENTO; BRITO; SILVA, 2020); Learning through blended learning in higher education: narrating student engagement (NASCIMENTO; PADILHA, 2020); Facebook as a Stage for Didactic Choreography: an analysis of student engagement (NASCIMENTO *et al*., 2019).

To Veiga (2013), students can engage: cognitively when they strive to solve problems and learn new knowledge or develop diverse skills and competencies; affectively when they feel cheerful and happy with the classes, with their classmates, with the teachers, Etc.; behaviorally, when they meet deadlines, turn in requested activities, and act respectfully in the classroom toward peers and teachers; and, agentic, when they manage their learning, signaling when they do not understand something or even suggesting to teachers other possibilities for activities or strategies that lead them to learn more and better. According to Nascimento (2021), motivation is needed for the subject to be involved with his learning, which he considers the fuel for engagement. Since motivation is something intrinsic but which is also impacted by external factors, it is suggested that on the same day, for example, the person can navigate through the continuum of engagement, going from totally disengaged to highly engaged and or showing variations along the way, over a period. One of the factors that can impact the subject's level of motivation and engagement is the work routine, the number of working hours, and the physical and emotional conditions present in the professional environment.

In higher education in Brazil (TERRIBILI FILHO, 2008), especially in public institutions, it is common for morning students to be fresh out of primary education, between 17 and 22 years old, who live with their parents or guardians and, typically, do not work. Furthermore, when he works, he has a shift from 2 pm to 10 pm or from 10 pm to 6 am. This reality is different for students who study at night, especially in private institutions. They are over 20

years old, most of them work morning or dawn shifts, leaving them with only the night shift to study.

Usually, after an intense day at work, the subject tends to be more tired at night, requiring greater effort to learn. On the other hand, when people have their studies available in the morning shift and only then go to work, it is expected that they will have more energy to study since the routine and problems of the work environment will come after college or university.

Because of the above, the research problem is: Are there significant differences in the level of engagement of students at a public institution, during the second year of the Covid19 pandemic, between those who study in the morning and evening shifts?

The hypotheses of this study are:

- H_0: There are significant differences in engagement levels between students who study in the morning and those who study at night.
- H_1: There are no significant differences in engagement levels between students who study in the morning and those who study at night.

The main objective of this research was to determine if there are significant differences in the engagement of higher education students from a public institution between those who study in the morning and evening shifts. The specific objectives were measuring students' engagement level per shift; and identify the level of engagement by dimension.

2. Methodological Procedure

The research subjects were 278 students (95 on the morning shift and 183 on the evening shift) from a higher education course in business administration at a public institution who were enrolled in the discipline of Marketing Strategies. The items that make up the EAE were entered into an electronic form and shared with the students mentioned above, returning 212 valid responses, 71 from the morning shift and 141 from the evening shift.

Data normality was assessed using the Kolmogorov-Smirnov and Shapiro-Wilk tests. The variance homogeneity assumption was evaluated using the Levene test. Bootstrapping procedures (1000 re-samplings; 95% IC BCa) were performed to obtain greater reliability of the results, to correct deviations from normality in the sample distribution and differences

between the sizes of the groups, and also to present an interval of 95% confidence for differences between means (HAUKOS; LEWIS, 2005).

After testing the correlation between the four factors defined a priori in the literature, the Fisher transformation r-to-z test was performed to understand the strength of the correlation between these variables.

As the sample includes students who study in two shifts, the student's t-test was performed for independent samples, to investigate to what extent the levels of student engagement were different between students in the morning and in the evening shifts.

From the analysis of the preliminary results, an Exploratory Factor Analysis (EFA) was carried out using SPSS, to know the factor loading and its commonalities through the extraction method: principal component analysis, and the method of rotation: Varimax with Kaiser Normalization. KMO and Bartlett's Sphericity tests were also performed.

After the EFA, it was observed that some factor loads have appeared in more than one factor, different from what was presented in the original scale (VEIGA, 2013). Given this fact, it was decided to perform a Multifactorial Confirmatory Factor Analysis (MCFA).

The MCFA was implemented using the Robust Diagonall y Weighted Least Squares (RDWLS) estimation method, which is suitable for categorical data (DISTEFANO; MORGAN, 2014; LI, 2016).

To evaluate the model, the adjustment indices used were: X^2; X^2/gl; Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Standardized Root Mean Residual (SRMR), and Root Mean Square Error of Approximation (RMSEA). X^2 values should not be significant; the X^2/gl ratio must be < 5 or, preferably, < 3; CFI and TLI values must be > 0.90 and preferably above 0.95; RMSEA values should be < 0.08 or, preferably < 0.06, with a confidence interval (upper limit) < 0.10 (BROWN, 2015). The reliability of the measure was measured using composite reliability (DAMÁSIO; VALENTINI, 2015; RAYKOV, 2007).

A multigroup confirmatory factor analysis (MGCFA) was performed to investigate the invariance of Student Engagement with the Escola de Veiga scale (2013) for students who study in different shifts (morning and evening). The analysis was implemented using the Robust Diagonally Weighted Least Squares (RDWLS) estimation method, which is suitable for categorical data (DISTEFANO; MORGAN, 2014; LI, 2016). The AFCMG evaluated the measure's invariance in three models: 'configural', metric, and scalar.

Model 1 ('configural' invariance) assessed whether the scale configuration (number of factors and items per factor) was acceptable for both groups (male and female). If the model is not supported, the factorial structure of the instrument cannot be considered equivalent for the assessed groups. Model 2 (metric invariance) analyzed whether the factor loadings of the items could be considered equivalent between the groups. Model 3 (scalar invariance) investigated whether the level of latent trait needed to endorse the item categories (thresholds) was equivalent between groups (CHEUNG; RENSVOLD, 2002).

To evaluate the 'configural' model, the fit indices used were Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Square Residual (SRMR), Comparative Fit Index (CFI), and Tucker-Lewis Index (TLI). CFI and TLI values must be > 0.90 and preferably above 0.95; RMSEA values should be < 0.08 or, preferably, < 0.06, with a confidence interval (upper limit) < 0.10 (BROWN, 2015). Measurement invariance was assessed using the CFI difference test (ΔCFI, CHEUNG; RENSVOLD, 2002). If, when fixing a parameter, a significant reduction in the CFI indices is found (ΔCFI > 0.01), the invariance of the measure cannot be accepted (CHEUNG; RENSVOLD, 2002)

3. Results

Table 1 shows that the variables (scale components and factors) did not have a normal distribution, p< 0.001. The agentic variable was the only one that demonstrated p> 0.05 (0.38).

Table 1: Normality Distribution of Items

Item	Average	Median	S.E.	Asymmetry (0,167)		kurtosis (0,333)		KS	SW
					Z		Z	(gl = 212)	(gl = 212)
COG-01	3,61	4	1,11	-0,685	-4,10*	-0,110	-0,33ns	0,246*	0,876*
COG-02	4,56	5	0,696	-1,626	-9,73*	2,860	8,59*	0,401*	0,652*
COG-03	3,07	3	0,947	0,070	0,41ns	-0,336	-1,01ns	0,216*	0,902*
COG-04	4,52	5	0,698	-1,374	-8,22*	1,412	4,24*	0,377*	0,688*
COG-05	3,29	3	1,053	-0,191	-1,14ns	-0,452	-1,36ns	0,185*	0,910*
AFE-06	4,37	5	0,967	-1,462	-8,75*	1,377	4,14*	0,375*	0,690*
AFE-07	3,54	4	1,090	-0,254	-1,52ns	-0,841	-2,53***	0,196*	0,895*
AFE-08	3,94	4	0,959	-0,494	-2,95**	-0,624	-1,87ns	0,210*	0,854*
AFE-09	3,85	4	0,916	-0,479	-2,86**	-0,200	-0,60ns	0,231*	0,869*
AFE-10	4,32	5	0,954	-1,277	-7,64*	0,805	2,42***	0,351*	0,725*
COM-11	4,75	5	0,521	-2,057	-12,31*	3,380	10,15*	0,478*	0,515*
COM-12	4,86	5	0,407	-3,117	-18,66*	9,493	28,51*	0,518*	0,371*
COM-13	4,99	5	0,137	-14,560	-87,18*	212,000	636,64*	0,523*	0,420*
COM-14	4,99	5	0,206	-14,560	-87,18*	212,000	636,64*	0,523*	0,420*
COM-15	3,82	4	0,885	-0,552	-3,30*	0,096	0,29ns	0,264*	0,865*
AGE-16	2,66	3	0,954	0,076	0,45ns	-0,350	-1,05ns	0,216*	0,900*
AGE-17	2,66	3	1,168	0,375	2,24***	-0,556	-1,67ns	0,184*	0,902*
AGE-18	3,57	4	1,127	-0,467	-2,79**	-0,484	-1,45ns	0,202*	0,893*
AGE-19	2,84	3	1,105	0,185	1,10ns	-0,712	-2,14***	0,193*	0,912*
AGE-20	2,65	3	1,120	0,386	2,31***	-0,445	-1,34ns	0,195*	0,903*

Cognitivo	19,05	19	3,008	-0,728	-4,35*	0,903	2,71**	0,120*	0,959*
Afetivo	20,02	21	4,104	-0,723	-4,32*	-0,040	-0,12ns	0,152*	0,926*
Comportamental	23,42	24	1,529	-2,314	-13,85*	10,398	31,23*	0,243*	0,789*
Agêntico	14,37	15	4,475	0,017	0,102ns	-0,382	-1,15ns	0,062ns	0,986ns

Note: * = p < 0.001; ** = p < 0.01; *** = p < 0.05; NS = Not significant.
Source: Developed by the author.

Table 2 presents the results of the correlations obtained. All variables are significantly correlated (cognitive with the others, p< 0.001; and between the others, p<0.01).

Table 2: Correlation analysis between variables

	Cognitive	Affective	Behavioral	Agentic
Cognitivo	-			
Afetivo	0,313*	-		
Comportamental	0,446*	0,215**	-	
Agêntico	0,265*	0,178**	0,212**	-

Note: * = p< 0,001; ** = p< 0,01.
Source: Developed by the author.

Fisher's r-to-z transformation test showed that the cognitive dimension was more strongly associated with the behavioral dimension (r = 0.446, p< 0.001) than with the affective dimension (r = 0.313, p< 0.001) (z = -1.721, p<0.05) when analyzing the strength of the association between cognitive-affective (r = 0.313, p< 0.001) and cognitive-agent (r = 0.265, p< 0.001), it was noticed that it was not significant (z = 0.576, p> 0, 05). On the other hand, the cognitive-behavioral (r = 0.446, p < 0.001) and behavioral-agent (r = 0.265, p < 0.001) correlation demonstrate that the cognitive dimension continued to be more strongly associated with the behavioral than with the agentic (z = 2.263, p < 0.05). When testing the strength of association between the other variables, affective-behavioral (r = 0.215, p< 0.01) and affective-agent (r = 0.178, p< 0.01), the results demonstrate that it was not significant (z = 0.438, p> 0.05).

Table 3: Student's t test for independent samples

		Scores		t test statistics					
							Mean Difference	CI of mean difference (95%)	
		M	DP	*t*	*Gl*	Valor – *p*		Limite inferior	Limite superior
Cognitiv	Morning	19,27	3,295	0,756	210	0,450*	0,331	- 0,532	1,195
	Nigth	18,94	2,859						
Affective	Morning	20,00	4,469	- 0,047	210	0,962*	- 0,028	- 1,208	1,152
	Nigth	20,03	3,924						
Behavioral	Morning	23,73	1,171	2,162	210	0,032**	0,477	0,042	0,912
	Nigth	23,26	1,662						
Agentic	Morning	15,31	4,013	2,194	210	0,029**	1,416	0,144	2,689
	Nigth	13,89	4,632						

Note: * = p > 0,05; ** = p < 0,05.
Source: Developed by the author.

The results have showed that morning students scored statistically higher on two dimensions (behavioral - M = 23.73, SD = 1.171; and agentic - M = 15.31, SD = 4.013) than night students (behavioral - M = 23.26, SD = 1.662; and agentic M = 13.89, SD = 4.632), (behavioral - $t(210) = 2.162$, $p< 0.05$; and agentic - $t(210) = 2.194$, $p< 0.05$). However, the effect size of the difference was small (behavioral - Cohen's d = 0.31; and agentic - Cohen's d = 0.32).

In the other dimensions, cognitive (morning - M = 19.27, SD = 3.295; and night - M = 18.94, SD = 2.859) and affective (morning - M = 20.00, SD = 4.469; and night - M = 20.03, SD = 3.924), the difference was not significant (cognitive - $t(210) = 0.756$, $p> 0.05$; and affective - $t(210) = - 0.47$, $p> 0.05$). The effect of the difference was also negligible (cognitive - Cohen's d = 0.11; and affective - Cohen's d = 0.01).

When performing the EFA in SPSS (Table 4), the Bartlett and KMO tests were not generated. It was noticed that some items had high loads in other factors, different from those suggested by the original scale (VEIGA, 2013). It was also observed that items COM-13 and COM14 have showed the same values.

Table 4: First Exploratory Factor Analysis

Dimension	Items	Factors[a]	
		Load	Comunality
Cognitive	COG-01	0,690	0,491
	COG-02	0,429	0,289
	COG-03	0,684	0,484
	COG-04	0,451	0,224
	COG-05	0,683	0,493
Affective	AFE-06	0,792	0,643
	AFE-07	0,851	0,749
	AFE-08	0,840	0,743
	AFE-09	0,794	0,684
	AFE-10	0,866	0,761
Behavioral	COM-11	0,427	0,497
	COM-12	0,546	0,495
	COM-13	0,944	0,895
	COM-14	0,944	0,895
	COM-15	0,195	0,411
Agentic	AGE-16	0,800	0,669
	AGE-17	0,790	0,662
	AGE-18	0,837	0,712
	AGE-19	0,856	0,742
	AGE-20	0,744	0,578

Note: a = Method of Extraction: principal component analysis.
Rotation Method: Varimax with Kaiser Normalization.
Source: Developed by the author.

It was decided to exclude item COM-13 and carry out the EFA again (Table 5), as it was understood that, according to Brazilian culture, "disturbing class on purpose" and "being rude to the teacher" are similar.

Are there significant differences in the level of engagement of students who study in the morning and evening shifts?

Table 5: Second Exploratory Factor Analysis

Dimension	Items	Factors[a] load	Factors[a] commonality	KMO	Bartlett's sphericity Qui-Quad.	*Gl*	*Sig*
Cognitive	COG-01	0,652	0,479				
	COG-02	0,452	0,304				
	COG-03	0,725	0,533				
	COG-04	0,509	0,272				
	COG-05	0,761	0,596				
Affective	AFE-06	0,796	0,659				
	AFE-07	0,850	0,750				
	AFE-08	0,841	0,750				
	AFE-09	0,789	0,699				
	AFE-10	0,867	0,761	0,815	1642,895	171	< 0,001
Behavioral	COM-11	0,755	0,667				
	COM-12	0,852	0,751				
	COM-14	0,625	0,407				
	COM-15	0,365	0,415				
Agentic	AGE-16	0,805	0,671				
	AGE-17	0,792	0,663				
	AGE-18	0,838	0,711				
	AGE-19	0,860	0,749				
	AGE-20	0,738	0,577				

Note: a = Extraction method: principal component analysis.
Rotation Method: Varimax with Kaiser Normalization.
Source: Developed by the author.

Table 5 shows that, after excluding item COM-13, the results of KMO > 0.5 (0.815) and Bartlett (1642.895, gl 171) p< 0.001 have confirmed the adequacy of the factor analysis, the correlation between the elements and the sample size to analyze the factors.

3.1 Confirmatory Factor Analysis (CFA).

Table 6 presents the adjustment indices of the multifactorial model for the Student Engagement with School scale (VEIGA, 2013).

Table 6: Indicators of adjustments of the multifactorial model for the EAE scale (Veiga, 2013)

X^2 (gl)	X^2/gl	CFI	TLI	SRMR	RMSEA (90% IC)
122,212 (146)	0,837	1,000	1,015	0,072	0,000 (0,000 – 0,011)

Source: Developed by the author.

After performing the MCFA, Table 7, it is noticed that only item COM14 have presented p > 0.05, having the lowest factor loading of the model.

Table 7: Factor Load

							95% ConfidenceInterval	
Factor	Indicator	Symbol	Estimate	Std. Error	z-value	p	Lower	Upper
Cognitiv	COG01	λ11	0.650	0.088	7.364	< .001	0.477	0.823
	COG02	λ12	0.394	0.066	5.969	< .001	0.264	0.523
	COG03	λ13	0.538	0.071	7.585	< .001	0.399	0.677

							95% ConfidenceInterval	
Factor	Indicator	Symbol	Estimate	Std. Error	z-value	p	Lower	Upper
	COG04	λ14	0.272	0.063	4.339	< .001	0.149	0.394
	COG05	λ15	0.627	0.086	7.326	< .001	0.459	0.794
Affective	AFE06	λ21	0.619	0.079	7.869	< .001	0.465	0.773
	AFE07	λ22	0.914	0.053	17.128	< .001	0.809	1.018
	AFE08	λ23	0.829	0.052	15.975	< .001	0.727	0.931
	AFE09	λ24	0.751	0.053	14.151	< .001	0.647	0.855
	AFE10	λ25	0.732	0.068	10.746	< .001	0.598	0.865
Bahavioral	COM11	λ31	0.245	0.051	4.844	< .001	0.146	0.344
	COM12	λ32	0.142	0.041	3.498	< .001	0.062	0.221
	COM14	λ33	0.004	0.005	0.850	0.395*	-0.005	0.013
	COM15	λ34	0.655	0.106	6.159	< .001	0.446	0.863
Agentic	AGE16	λ41	0.738	0.057	12.854	< .001	0.625	0.850
	AGE17	λ42	0.918	0.070	13.068	< .001	0.780	1.056
	AGE18	λ43	0.875	0.065	13.492	< .001	0.748	1.002
	AGE19	λ44	0.885	0.062	14.280	< .001	0.763	1.006
	AGE20	λ45	0.778	0.074	10.548	< .001	0.633	0.922

Note: ***** = p > 0.05.
Source: Developed by the author.

When analyzing the correlation between the dimensions through the CFA, it is noticed that only the behavioral-agent association presented p > 0.05, as shown in Table 8.

Table 8: Covariance of Factors

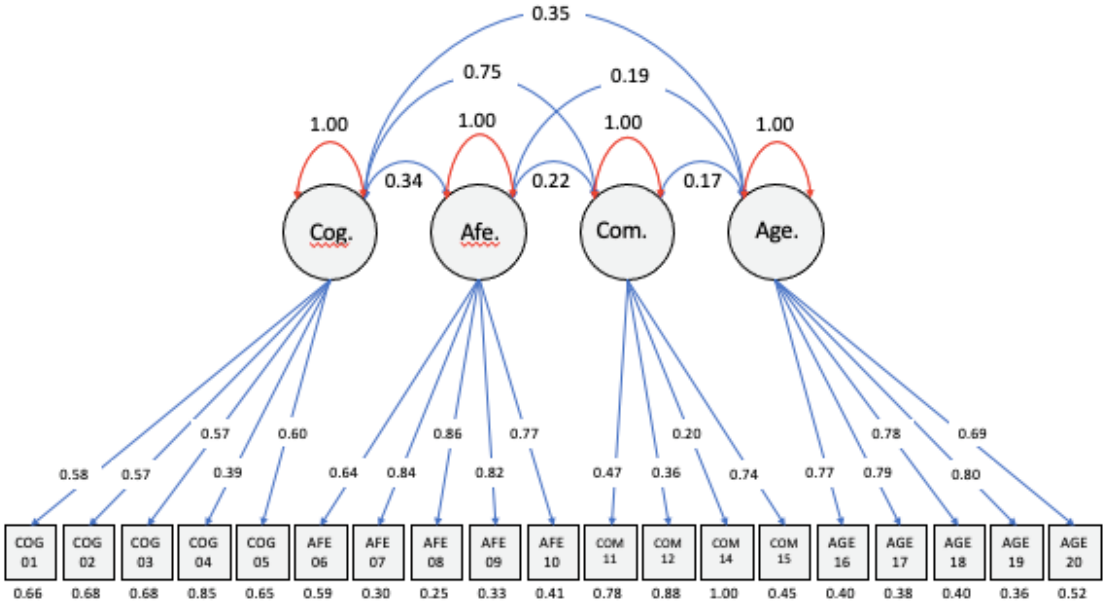
						95% Confidence Interval	
		Estimated	standard error	Value z	p	Bigger	Smaller
Cognitive	↔ Affective	0.344	0.076	4.516	< .001*	0.194	0.493
Cognitive	↔ Behavioral	0.747	0.088	8.502	< .001*	0.575	0.919
Cognitive	↔ Agentic	0.350	0.082	4.248	< .001*	0.188	0.511
Affective	↔ Behavioral	0.223	0.093	2.408	0.016**	0.042	0.405
Affective	↔ Agentic	0.185	0.074	2.492	0.013**	0.040	0.331
Behavioral	↔ Agentic	0.174	0.090	1.939	0.052ns	-0.002	0.350

Note: ***** = p < 0.001; ****** = p < 0.05; ns = not significant.
Source: Developed by the author.

Figure 1 shows the structure and factor loadings of the items on the Student Engagement with School scale (VEIGA, 2013).

Are there significant differences in the level of engagement of students who study in the morning and evening shifts?

Figure 1: EAE Factor Loading Structure



Note: Cog = Cognitive; Afe = Affective; With = Behavioral; Age = Agentic.
Source: Developed by the author.

The MGCFA performed using the JASP software suggests the following correlation adjustments (Table 9):

Table 9: Covariance of Residues

	Mod. Ind.	EPC
COM11 ↔ COM12	9.502	0.108
AFE06 ↔ AFE10	6.116	0.278
COG02 ↔ AGE18	4.782	0.117
AFE06 ↔ AGE20	4.522	-0.176
COM11 ↔ COM15	4.241	-0.149

Source: Developed by the author.

It was decided not to proceed with the adjustments in the analysis, as it would improve the result but would not change the model, persisting with the same need for adjustments in other studies.

The following results were obtained when evaluating whether the scale is invariant between morning and evening shift students (table 10).

Table 10: Multigroup Confirmatory Factor Analysis (MGCFA) for EAE

Measure invariance	Goodness-of-fit indexes				
EAE	RMSEA (90% IC)	SRMR	TLI	CFI	ΔCFI
Configuration Invariance	0,000 (0,000 – 0,118)	0,032	1,060	1,000	-
Metric Invariance	0,000 (0,000 – 0,090)	0,046	1,054	1,000	0.000
Scalar Invariance	0,000 (0,000 – 0,105)	0,056	1,001	1,000	0.000

Source: Developed by the author.

As can be seen in Table 9, the results comply with the configurational, metric, and scalar invariance, demonstrating that the EAE is an equivalent measure for students who study in the morning and evening shifts, which allows comparison between groups.

4. Conclusions

The Student Engagement with School scale, when used with public higher education students during the COVID-19 pandemic, who were taking the Marketing Strategies subject in a sample of 212 students (71 in the morning shift and 141 in the evening shift), have demonstrated relevant engagement rates in the Cognitive (average 19.05 out of 25 points), Affective (average 20.02 out of 25 points), Behavioral (average 23.42 out of 25 points) and Agentic dimensions, with the lowest level (average 14.37 of 25 points).

When carrying out the EFA, it was noticed the need to exclude item COM-13, as it has an equivalent meaning to item COM-14, with the second having an adequate description of the Brazilian context for higher education students.

The MCFA have demonstrated the need to review some scale items based on the adjustment indices, indicating that some items can explain more than one factor. It is therefore suggested to review the items of the Student Engagement with School scale to reduce possible weaknesses of the instrument in the Brazilian context, especially concerning the profile of higher education students.

The EAE is invariant to the students' shift, allowing its users to compare the level of engagement of students who study in the morning shift and those who study at night confirming hypothesis H1.

References

ASPAROUHOV, T.; MUTHEN, B. **Simple second order chi-square correction**. Unpublished manuscript, 2010. Disponível em: https://www.statmodel.com/download/WLSMV_new_chi21.pdf. Acesso em: 15 abr. 2022.

BASTIANELLO, M. R.; PACICO, J. C.; HUTZ, C. S. Optimism, self-esteem and personality: adaptation and validation of the Brazilian Version Of The Revised Life Orientation Test (LOT-

R). In: **Psico-USF**, 19(3), 2014, 523-531. https://doi.org/10.1590/1413-82712014019003014. Acesso em: 15 abr. 2022.

BROWN, T. **Confirmatory Factor Analysis for Applied Research** (2nd Ed). Guilford Press, 2015.

BROWN, T. A. **Confirmatory factor analysis for applied research**. New York: The Guilford Press, 2006.

CHEUNG, G. W.; RENSVOLD, R. B. Evaluating Goodness-of-Fit Indexes for Testing Measurement Invariance. In: **Structural Equation Modeling: A Multidisciplinary Journal**, 9(2), 2002, 233–255. https://doi.org/10.1207/S15328007SEM0902_5. Acesso em: 15 abr. 2022.

DISTEFANO, C.; MORGAN, G. B. A Comparison of Diagonal Weighted Least Squares Robust Estimation Techniques for Ordinal Data. In: **Structural Equation Modeling**, 21(3), 2014, 425-438. https://doi.org/10.1080/10705511.2014.915373. Acesso em: 15 abr. 2022.

FERRANDO, P. J.; LORENZO-SEVA U. Assessing the quality and appropriateness of factor solutions and factor score estimates in exploratory item factor analysis. In: **Educational and Psychological Measurement**, 78, 2018, 762-780. https://doi.org/10.1177/0013164417719308. Acesso em: 15 abr. 2022.

FREDERICKS, J. Measuring student engagement in upper elementary through high school: a description of 21 instruments. In: **Regional Educational Laboratory Program: Issues & Answers**. 98, 2011. Disponível em: https://files.eric.ed.gov/fulltext/ED514996.pdf. Acesso em: 15 abr. 2022.

HAUKOOS, J. S.; LEWIS, R. J. Advanced statistics: Bootstrapping confidence intervals for statistics with "difficult" distributions. In: **Academic Emergency Medicine**, 12(4), 2005, 360-365. https://doi.org/10.1197/j.aem.2004.11.018. Acesso em: 15 abr. 2022.

HAUCK-FILHO, N.; TEIXEIRA, M. A. P.; MACHADO, W. L.; BANDEIRA, D. R. Marcadores reduzidos para a avaliação da personalidade em adolescentes. In: **Psico-USF**, 17(2), 2012, 253-261. Disponível em: https://www.scielo.br/j/pusf/a/DWPGThRtmXwKqNxKLwsBk7n/?lang=pt. Acesso em: 15 abr. 2022.

LI, C. H. Confirmatory factor analysis with ordinal data: Comparing robust maximum likelihood and diagonally weighted least squares. In: **Behavioral Research Methods**, 48(3), 2016, 936-49 https://doi.org/10.3758/s13428-015-0619-7. Acesso em: 15 abr. 2022.

LORENZO-SEVA, U.; FERRANDO, P.J. Robust Promin: a method for diagonally weighted factor rotation. **Technical report**, URV. Tarragona, Spain, 2019.

NASCIMENTO, E. R. **Engajamento docente e coreografias institucionais**: um estudo sobre cursos superiores de tecnologia ofertados por meio de uma educação híbrida a partir de um web currículo. 2021. 207 f. Tese (Doutorado em Educação Matemática e Tecnologia) - Programa de Pós-Graduação de Educação Matemática e Tecnológica, Universidade Federal de Pernambuco (UFPE), 2021.

NASCIMENTO, E. R; ANJOS, F. L. M. R.; SILVA, C. L.; PADILHA, M. A. Facebook como Palco de uma Coreografia Didática: uma análise sobre o engajamento estudantil In: **Inovações**

Pedagógica e Coreografias Didáticas: das tecnologias e metodologias às práticas efetivas.1 ed. São Paulo: Editora Cajuína, 2019.

NASCIMENTO, E.R; BRITO, I. P. L.; SILVA, A. G. P. (2020) Aprendizagem em ambientes multitarefas. Uma realidade na Cultura Maker. In: **Revista de Estilos de Aprendizaje**. v.13, 2020. p.157 - 170. Disponível em: http://revistaestilosdeaprendizaje.com/article/view/2036. Acesso em: 16 jun. 2022.

NASCIMENTO, E. R.; PADILHA, M. A. Aprendizagem por meio do ensino híbrido na educação superior: narrando o engajamento dos estudantes. In: **Revista Diálogo Educacional**, [S. l.], v. 20, n. 64, 2020. https://doi.org/10.7213/1981-416X.20.064.AO04. Disponível em: https://periodicos.pucpr.br/dialogoeducacional/article/view/25579. Acesso em: 16 jun. 2022.

NASCIMENTO, E. R.; PADILHA, M. A. S. (org.) **Engajamento**: estudantil, docente e institucional. Joinville: Clube de Autores, 2021.

RAYKOV, T. Estimation of composite reliability for congeneric measures. In: **Applied Psychological Measurement**, 21(2), 1997, 173-184. https://doi.org/10.1177/014662169702100206. Acesso em: 15 abr. 2022.

RECKASE, M. D. The difficulty of test items that measure more than one ability. In: **Applied Psychological Measurement**, 9, 1985, 401-412. https://doi.org/10.1177/014662168500900409. Acesso em: 15 abr. 2022.

TERRIBILI FILHO, A. Ensino Superior Noturno no Brasil: Estudar para Trabalhar ou Trabalhar para Estudar? In: **Revista Pensamento & Realidade**, 22, 2008. Disponível em: https://revistas.pucsp.br/pensamentorealidade/article/view/8299. Acesso em 15 jun. 2022.

TIMMERMAN, M. E.; LORENZO-SEVA, U. Dimensionality Assessment of Ordered Polytomous Items with Parallel Analysis. In: **Psychological Methods**, 16, 2011, 209-220. https://doi.org/10.1037/a0023353. Acesso em: 15 abr. 2022.

VALENTINI, F.; DAMÁSIO, B. F. Variância Média Extraída e Confiabilidade Composta: Indicadores de Precisão. In: **Psicologia: Teoria e Pesquisa**, 32(2), 2016. https://doi.org/10.1590/0102-3772e322225. Acesso em: 15 abr. 2022.

VEIGA, F. H. (2013) Envolvimento dos Alunos Na Escola: elaboração de uma nova escala de avaliação. In: **International Journal of Developmental and Educational Psychology**, No1-Vol.1. ISSN: 0214-9877. pp:441-450. Disponível em: https://repositorio.ul.pt/handle/10451/10032. Acesso em: 15 abr. 2022.

Sobre os autores

Ernandes Rodrigues do Nascimento
Pós-Doutorando em Ciências da Educação (Universidade de Lisboa). Doutor em Educação Matemática e Tecnológica (UFPE). Mestre em Educação (ULE). Mestre em Administração (UFPE). Especialista em EAD (ESAB) e Bacharel em Administração (FACIG). Líder do Laboratório de Pesquisa e Prática - Educação, Metodologias e Tecnologias - Lab Educat (UFPE). Pesquisador Convidado no Núcleo de Estudos e Pesquisa de Práticas Inovadoras – NEPPI, e no Grupo de Pesquisa de Economia Criativa.
E-mail: ernandesrn@gmail.com . Orcid: https://orcid.org/0000-0003-3683-6339

Are there significant differences in the level of engagement of students who study in the morning and evening shifts?

Karla Karina de Oliveira Menezes
Doutoranda em Gestão de Empresas (Universidade de Coimbra). Mestre em Comportamento do Consumidor (UFPE). Especialista em EAD (Universidad Europea de Madrid). Bacharel em Administração (FICR). Professor Adjunto (IPS-Portugal). Pesquisadora do CEBER (Universidade de Coimbra).
Afiliação: Instituto Politécnico de Setúbal, Campus do IPS - Estefanilha, 2910-761 Setúbal, Portugal and Faculty of Economics, Universidade de Coimbra, Av. Dias da Silva, 165, 3004-512 CeBER, Coimbra, Portugal.
E-mail: karla.menezes@esce.ips.pt. Orcid: https://orcid.org/0000-0002-1944-9866

Isabel Pauline Lima de Brito
Biografia: Graduada em Letras pela Faculdade de Filosofia Ciências e Letras de Caruaru (1997), graduação em Comunicação Social - Jornalismo pela Faculdade do Vale do Ipojuca (2007) e mestrado em Linguística pela Universidade Federal da Paraíba (2016). É professora ativa permanente do INSTITUTO FEDERAL DE PERNAMBUCO - RECIFE desde julho de 2010. Tem experiência na área de Linguística e Educação e é doutora em Educação pelo programa EDUMATEC da Universidade Federal de Pernambuco.
E-mail: isabelflooi16@gmail.com. ORCID: https://orcid.org/0000-0001-6153-0898

Recebido em: 16/12/2022
Aceito para publicação em: 22/05/2023