Ansaq Journal for arts, literature and humanities
11th edition
Volume (4) Issue (2)
2023 (15-28)

Validation of the e-learning readiness instrument in physical education: A contextual study in Tunisia

Adel Ayed
Higher Institute of Sport and Physical Education of Kef, University of Jendouba, ***Tunisia***
Ayed Houssem
Engineering School of Communication of Tunis, University of Cartage, ***Tunisia***
Azaiez Fairouz
Higher Institute of Sport and Physical Education of Gafsa, University of Gafsa, Gafsa, ***Tunisia***

Published Online on : 22 Feb.2024

Abstract

Background

Physical education is rapidly evolving with the increasing integration of technologies and online learning platforms. In Tunisia, this transition to online learning of physical education requires a thorough evaluation of preparatory tools in order to ensure an effective learning experience adapted to the needs of students.

Aim

This study aims to validate an instrument specifically designed to measure the preparation of Tunisian students for online learning of physical education. The instrument was evaluated based on criteria such as temporal stability, face validity and internal consistency. By closely examining the characteristics of this instrument, the study will also explore potential differences between middle and high school students, as well as the impact of affiliation with sports associations and civic clubs on college readiness online learning.

Methods

The study sample will be composed of Tunisian students aged 13 to 22, representing different academic levels and affiliated with sports clubs. Data

will be collected using a specific questionnaire and an in-depth analysis will be carried out using appropriate statistical methods.

Results

The alpha coefficients of the four dimensions of the physical education online learning readiness instrument indicate excellent internal consistency, respectively 0.989 (sense of competence), 0.986 (self-directed learning), 0.861 (motivation) and 0.953 (perceived usefulness). The adequacy indices of the confirmatory factor analysis were satisfactory.

Conclusion

The results of this study will contribute to the understanding of the readiness of Tunisian students for online learning of physical education, thus providing valuable information for the future development of technology-based educational programs in the Tunisian context.

Keywords: feeling of competence, autonomous learning, sports motivation, perceived usefulness, online teaching.

*** Introduction**

Physical education contributes to the holistic development of individuals, health, fitness and well-being (Edwards, Ngcobo, Edwards, & Palavar, 2005). In the digital age, online learning in this field has undergone significant evolution (Rohr, Costello, & Hawkins, 2015), requiring the development of online learning environments adapted to this discipline. To assess the effectiveness and adequacy of these environments, it is essential to have valid and reliable measurement tools (Alem, 2013a; DESBIENS, Naila, SPALLANZANI, VANDERCLEYEN, & BEAUDOIN, 2018; Bouletreau, Chouaniere, Wild, & Fontana, 1999). This study aims to validate a measurement tool that fits into the broader context of the evolution of teaching and learning, marked by the transition to distance and hybrid teaching modalities (Charlier, Deschryver , & Peraya, 2006). The validation of this tool is crucial for physical educators, researchers and educational institutions, because it will make it possible to precisely measure the effectiveness and adaptability of virtual environments dedicated to this discipline. This study lays the foundations for the validation of the tool, highlighting its importance and the challenges associated with this process. It also invites the reader to understand the potential impact of this research on improving the quality of physical education teaching in the digital age (Bernier, 2016; El Louadi, 2001; Khadir, 2021) , educational

sciences (Fraser & Treagust, 1986; Genoud, 2008; Shariff, 2005) and psychometrics (Facon, 2007). Recent studies suggest that online interactions can effectively motivate students and engage them in their learning (Rasheed et al., 2020). To guarantee the quality of interactions, clear guidelines are necessary in the field of physical education and sport. The measurement tool tests three dimensions: self-directed learning (Ansari & Khan, 2020), feeling of competence (Kalajas-Tilga, Koka, Hein, Tilga, & Raudsepp, 2020) and perceived usefulness (Wallace, Scanlon , & Calderón, 2023). The objective of this study was to evaluate these dimensions and validate the measurement instrument of (Alem, F. 2013) (Development and Validation of an E-Learning Readiness Measurement Instrument) which measures the appreciation of the use educational technology and information in education. Research on online learning readiness in physical education is currently frightening in Arabic-speaking countries. The study of the validation of a psychometric instrument for preparation for online learning in physical education in Tunisia can therefore have several interests, such as: the identification of the needs and expectations of learners in terms of online training in physical education, the development of strategies and resources adapted to promote the success and satisfaction of learners in online physical education and the contribution to the advancement of scientific knowledge on preparation for online learning and its application in the context Tunisian.

*** Methods and materials**

*** Population**

Our study sample includes 641 Tunisian students aged 13 to 18 (43.1%) and 19 to 22 (56.9%). Among them, 310 were boys (48.4%) and 331 girls (51.6%). At the time of data collection, 289 participants (45.1%) were middle school students, while 352 were high school students (54.9%). In addition, 306 participants (47.7%) were members of civil associations and clubs, while 335 (52.3%) were unaffiliated and only practiced sports during physical education sessions. They came from different regions of Tunisia.

All study participants were volunteers and participated anonymously and confidentially. They gave their written and informed consent. Participants were required to use the same pseudonym for both tests, and were not offered any financial or material incentives.

*** Measurement**

Our study aimed to validate an instrument for measuring students' predisposition to online learning, developed by (Alem, 2013b). This instrument is based on a 7-point Likert scale, comprising four dimensions: computer and Internet skills, belief in the effectiveness of online learning, independent learning and interaction with teachers and/or students. We chose this scale to evaluate different preparation instruments for online learning in a sample of Tunisian students, with a view to identifying the strengths and weaknesses of the actors involved in e-learning in physical education, and to propose appropriate solutions to improve the quality of teaching in this discipline. We also used this scale to evaluate the effectiveness of pedagogical innovation and the integration of information and communication technologies in physical education, taking into account the specificities of this area.

*** Procedure**

Our procedures for translating and adapting the e-learning preparation instrument in physical education, initially validated in French by Alem Farid 2013, involved a two-step translation process. This cross-cultural validation followed the International Testing Commission (ITC) guidelines (Beaton, Bombardier, Guillemin and Ferraz, 2000; Gana, Broc, Boudouda, Calcagni and Ben Youssef, 2020). This process included a translation of the instrument from its original language into Arabic. The aim of this approach was to identify and correct any discrepancies, errors or ambiguous interpretations that might have arisen in the initial translation. The translation process was carried out by two separate teams, each composed of two translators. These translators were selected based on their expertise and mastery of the source and target languages, which helped ensure the accuracy and integrity of the translation. In conclusion, the Arabic version of the instrument remained unchanged after the translation process. Finally, the final version implemented in Arabic was directly compared to the original version of the article to ensure fidelity and accuracy.

The administration of the questionnaire took place from February 2023 to March 2023, the questionnaires were distributed. We informed the students and their parents of the objectives of the work. The scales were distributed to the teams before the training session. The instructions for the tool were well explained to the participants.

This study followed the principles set out in the Declaration of Helsinki. The research protocol was approved by the Scientific and Ethics Committee of the Higher Institute of Sports and Physical Education of Kef (UR-22JS01). Before participating in the study, young participants and their parents received a full verbal explanation of the study, detailing the protocol and its potential risks and benefits. The raw data collected from the participants were analyzed in complete confidentiality.

*** Statistical analysis**

Normality of data was assessed by assessing skewness and kurtosis. To verify the psychometric quality of the construct, internal consistency was assessed by calculating Cronbach's alpha coefficient. The temporal stability of the questionnaire was measured using a test-retest approach. Predictive validity was tested by calculating a correlation matrix and Pearson's correlation coefficient.

To examine the factorial structure of the questionnaire, an exploratory factor analysis (EFA) of the orthogonal Varimax type (Kaiser, 1958) with a principal component analysis (PCA) was carried out on our questionnaire of 17 items taken from the Alem tool. Farid (2013). An item was retained if it presented a satisfactory factor loading, that is to say equal to or greater than 0.40 (Archer, Saltelli, & Sobol, 1997; Moore, Dickson-Deane, & Galyen, 2011). Sampling adequacy was measured by calculating the Kaiser-Meyer-Olkin (KMO) test. First-order confirmatory factor analysis (CFA) with maximum likelihood estimation was performed to verify the four-dimensional factor structure. To test the adequacy of the collected data to the theoretical model, it is generally recommended to use several types of indices (Schermelleh-Engel, Moosbrugger, & Müller, 2003). Thus, Roussel et al. (2002) advise presenting at least two adjustment indices from each family of indices. These indices assess the extent to which the a priori theoretical model faithfully reproduces the data. The most used index is the Chi-square (Satorra & Bentler, 1994), which does not have to be statistically significant. For a complete assessment of model fit, we used the goodness-of-fit index (GFI) (Satorra & Bentler, 1994) and its adjusted value (AGFI), which should be equal to or greater than 0.90 and 0.85, respectively (Schermelleh-Engel et al., 2003). We also relied on the root mean square error of approximation (RMSEA). Unlike the GFI, this index makes it possible to test for poor fit. It should be

less than 0.05 for a good fit and 0.08 for an acceptable fit, according to some researchers (Jöreskog & Sörbom, 1996; MacCallum, Browne, & Sugawara, 1996), who also suggest using the Chi ratio. -two on the degrees of freedom to distinguish "overfit" models from "underfit" models. The target threshold generally proposed by Carvalho and Chima is ≤3. However, some authors (Rousselle & Vigneau, 2016) agree on an acceptance threshold of ≤2. Furthermore, we used the standardized root mean square residual (SRMR), which must be ≤0.10 for an acceptable fit (Schermelleh-Engel et al., 2003). In addition, the comparative fit index (CFI), non-normalized fit index (NNFI), normalized fit index (NFI), and parsimonious NFI (PNFI) are also particularly relevant, especially when This involves comparing different alternative models. The NFI value must be ≥0.90 and the CFI, NFI, NNFI and PNFI values must be ≥0.95 (Byrne, 2001; Schermelleh-Engel et al., 2003).

Furthermore, a sensitivity analysis (analysis of variance, ANOVA) was carried out to assess the impact of age, gender and study type on the scores of each dimension of the questionnaire. EFA was conducted on a random sample while CFA was conducted on the other half of the sample. EFA was carried out using the commercial software "Statistical Package for Social Sciences (SPSS for Windows, version 24, IBM, Armonk, NY, USA)", while CFA was carried out with AMOS (version 24 , IBM, Armonk, NY, USA).

* Results

* Quality of construction

Table 1. Basic characteristic of the sample population

Variable		Effective		Pourcentage (%)
Gender	Male	Total (N = 640)	310	48,4
		EFA (n = 301)	172	57,1
		CFA (n = 340)	189	55,6
		Test retest (n=40)	25	62,5
	Female	Total (N = 640)	331	51,6
		EFA (n = 301)	129	42,9
		CFA (n = 340)	151	44,4
		Test retest (n=40)	15	37,5
Niveau scolaire	Middle	Total (N = 640)	289	45,1
		EFA (n = 301)	133	44,2
		CFA (n = 340)	150	44,1
		Test retest (n=40)	18	45
	secondary	Total (N = 640)	352	54,9
		EFA (n = 301)	168	55,8
		CFA (n = 340)	190	55,9
		Test retest (n=40)	22	55
Affiliation sportive	affiliated	Total (N = 640)	305	47,7
		EFA (n = 301)	173	57,5
		CFA (n = 340)	191	56,2
		Test retest (n=40)	25	62,5
	Not affiliated	Total (N = 640)	335	52,3
		EFA (n = 301)	128	42,5
		CFA (n = 340)	149	43,8
		Test retest (n=40)	15	37,5

Table 2. The test-retest reliability of the ELRPE- 17 (n = 40)

Variable	Test 1 M ± SD	Test 2 M ± SD	α-Cronbach	r de Pearson	*P*-value
FC (5 items)	31,18±2,22	31,07±1,96	0,905	0,968	p<0,001
M (5 items)	31,25±1,98	31,20±1,89	0,833	0,954	p<0,001
Sl (4 items)	25,10±1,94	25,10±1,93	0,973	0,980	p<0,001
U (3 items)	18,83±1,44	18,85±1,42	0,952	0,957	p<0,001
Total (17 items	106,35±3,4	106,23±3,32	0,651	0,952	p<0,001

** P < 0.001

Note: FC, Feeling Competence; M, motivation; SL, self-learning; U (uselness)

The data was found to be normally distributed with respect to skewness and kurtosis. Furthermore, our results revealed that the Physical Education Online Learning Readiness Instrument (Alem, F. 2013) had good temporal stability, with a correlation coefficient (r) of 0.952 between the test measures and retest.

Predictive validity was tested using Pearson correlation. The results of the correlation matrix between the 17 statements of the e-learning readiness scale showed a positive correlation at $p < 0.001$ between most of the variables. The correlation coefficient (r) ranged from 0.005 to 0.986. For certain statements, the correlations were strong, such as the correlation between item 3 ("I am able to use ICT to learn") and item 7 ("I am able to use ICT to communicate with my teachers and my peers") ($r = 0.986$ at $p < 0.01$), and between item 1 ("I. I am able to work alone without supervision") and item 2 ("I am able to plan my work") ($r = 0.966$ at $p < 0.01$). However, there are items that are inversely correlated, such as between item 8 (“I am able to plan my online learning”) and item 12 (“I am confident in my ability to communicate with my teachers and peers online") ($r = -0.193$ at $p < 0.05$). However, some coefficients are low, for example the correlation between item 8 ("I am able to plan my online learning") and item 11 ("I can use ICT to access learning resources") ($r = 0.119$ at $p < 0.05$), and between item 5 ("I am able to manage my time") and item 07 ("I am able to use ICT to communicate with my teachers and my peers") ($r = 0.117$ at $p < 0.05$).

Tableau 3 : Structure factorielle de l'IPOLPE -17 en langue arabe

	Components			
	1	2	3	4
Q1.	0.973			
Q2	0.955			
Q5	0.926			
Q6	0.854			
Q10	0.791			
Q4		0.961		
Q8		0.942		
Q9		0.894		
Q14		0.827		
Q15		0.831		
Q3			0.974	
Q7			0.969	
Q11			0.914	
Q17			0.856	
Q12				0.971
Q13				0.955
Q16				0.956

* Exploratory factor analysis

The results of the exploratory factor analysis (EFA) indicate that the physical education e-learning readiness scale for students faithfully reproduces the expected theoretical model (in terms of item homogeneity) with good internal consistency overall (α = 0.828). Each dimension has excellent internal consistency, with respective values of 0.945 (sense of competence), 0.938 (motivation), 0.953 (self-directed learning) and 0.981 (perceived usefulness). The Kaiser-Meyer-Olkin measure indicated good sample adequacy (KMO = 0.808 at $p< 0.001$). The eigenvalue of the sense of competence dimension was 4.97, accounting for 29.26% of the total variance, while the eigenvalue of the motivation dimension was 4.46, explaining up to 55.51 % of total variance. The eigenvalue of the self-directed learning dimension was 3.05, explaining up to 73.45% of the total variance. Finally, the eigenvalue of the perceived usefulness dimension was 2.13, explaining up to 85.98% of the total variance. (See Fig. 1)

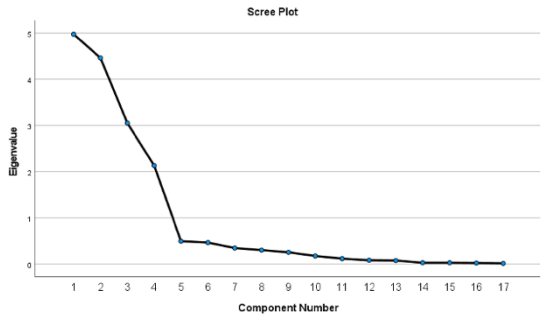

Fig 1. Scree plots of eigenvalues in factor analyses

* Confirmatory factor analysis

Our model had a statistically significant chi-square value [χ^2 = 302.754, with 113 degrees of freedom, at $p< 0.01$]. The goodness-of-fit index (GFI) was satisfactory (0.907), the normalized goodness-of-fit index (NFI) was 0.963, and the non-normalized goodness-of-fit index (NNFI) was 0.972. Furthermore, the comparative goodness-of-fit index (CFI) reached 0.977, the adjusted

goodness-of-fit index (AGFI) was 0.874, the root mean square error of approximation (RMSEA) was 0.07, the residual normalized root mean square (SRMR) was 0.04 and the parsimonious normalized goodness-of-fit index (PNFI) was 0.8. In summary, the 17-item model demonstrated an excellent fit to the theoretical model for all indices tested, thus confirming the four-dimensional factor structure for the Tunisian student population (as illustrated in Figure 2). Based on the ANOVA results, sensitivity analysis did not indicate remarkable effects of age, gender, and education level on scores in different domains. However, in terms of interaction effects, no significant influence was detected.

Table 2.Correlations between the 17-Item ELRSPE

		Q1	Q2	Q5	Q6	Q10	Q4	Q8	Q9	Q14	Q15	Q3	Q7	Q11	Q17	Q12	Q13	Q16
Q1	r	1																
	P																	
Q2	r	,966**	1															
	P	<,001																
Q5	r	,921**	,889**	1														
	P	<,001	<,001															
Q6	r	,880**	,768**	,702**	1													
	P	<,001	<,001	<,001														
Q10	r	,718**	,688**	,719**	,633**	1												
	P	<,001	<,001	<,001	<,001													
Q4	r	-,026	-,036	-,044	-,018	-,071	1											
	P	,653	,539	,443	,759	,220												
Q8	r	,046	,055	,064	,024	,092	,972**	1										
	P	,427	,339	,271	,678	,112	<,001											
Q9	r	-,076	-,085	,069	-,068	-,059	,868**	,842**	1									
	P	,188	,142	,871	,242	,304	<,001	<,001										
Q14	r	-,113*	-,122*	-,142*	,016	-,090	,786**	,740**	,609**	1								
	P	,050	,035	,014	,780	,117	<,001	<,001	<,001									
Q15	r	-,022	-,032	,008	-,005	,045	,710**	,692**	,713**	,632**	1							
	P	,705	,578	,896	,934	,433	<,001	<,001	<,001	<,001								
Q3	r	,079	,082	,124*	,085	,138*	,164**	,170**	,197**	,126*	,155**	1						
	P	,171	,156	,031	,141	,016	,004	,003	<,001	,028	,007							
Q7	r	,072	,075	,117*	,078	,129*	,156**	,163**	,189**	,119*	,145*	,986**	1					
	P	,213	,194	,042	,178	,026	,007	,005	<,001	,039	,012	<,001						
Q11	r	,058	,060	,101	,030	,096	,113	,119*	,146*	,064	,150**	,891**	,878**	1				
	P	,319	,296	,079	,387	,097	,050	,039	,011	,270	,009	<,001	<,001					
Q17	r	,032	,035	,098	,038	,139**	,109	,115*	,144*	,100	,151**	,801**	,784**	,671**	1			
	P	,367	,339	,090	,314	,006	,059	,045	,012	,083	,009	<,001	<,001	<,001				
Q12	r	,229**	,204**	,256**	,203**	,314**	,174**	,193**	,124*	,133*	,065	,156**	,149**	,160**	,154**	1		
	P	<,001	<,001	<,001	<,001	<,001	,002	<,001	,032	,019	,262	,007	,010	,005	,006			
Q13	r	,243**	,217**	,269**	,219**	,327**	,174**	,193**	,124*	,149**	,065	,142*	,133*	,140*	,144*	,958**	1	
	P	<,001	<,001	<,001	<,001	<,001	,002	<,001	,032	,010	,262	,014	,019	,011	,013	<,001		
Q16	r	,221**	,195**	,247**	,197**	,295**	,167**	,185**	,117*	,128*	,056	,176**	,168**	,179**	,177**	,959**	,917**	1
	P	<,001	<,001	<,001	<,001	<,001	,004	,001	,043	,026	,332	,002	,003	,002	,002	<,001	<,001	

Note. P,p-value; r,Pearson's correlation coefficient

Table 4. The 17-Item ELRSPE

	Les dimensions	Les items en anglais
01		I am capable of working alone without supervision.
02		I am capable of planning mywork.
05		I am capable of managing my time.
06		I am capable of using information and communication technologies (ICT).
10		I have a personal computer.
04		I am able to use ICT to manage my learning time.
08		I am able to plan my online learning.
09		I am able to set online learning goals.
14		I am motivated to learn online.
15		I have confidence in my ability to learn online.
03		I am able to use information and communication technologies (ICT) to learn.
07		I am able to use ICT to communicate with my teachers and peers.
11		I am able to use ICT to access learning resources.
17		I am capable of using ICT for resolving problems related to learning
12		I have confidence in my ability to communicate with my teachers and peers online.
13		Online learning is useful for me.
16		Online learning is a practical alternative for me.

* Discussion

In summary, the results of our research demonstrate that the Arabic adaptation of the e-learning readiness scale assessment tool in physical education is a reliable and valid instrument. It effectively measures the level of online learning readiness in physical education among participants of both sexes and in various educational settings, including civil club affiliates and non-affiliates. Overall, this adapted instrument has strong psychometric properties.

Furthermore, data obtained from the EFA indicate that this physical education e-learning readiness assessment instrument aligns well with the anticipated theoretical framework, displaying strong internal consistency

across all dimensions measured. The questionnaire, composed of 17 items, showed high reliability (Cronbach's alpha = 0.828) and exceptional temporal stability ($r = 0.952$, $p < 0.001$). Additionally, the CFA fit indices were favorable, with values such as CFI at 0.97, NFI at 0.96, NNFI and IFI at 0.97, GFI at 0.90, AGFI at 0, 87, and SRMR and RMSEA (Root Mean Square Error of Approximation) at 0.07. Furthermore, the EFA results indicated that this measurement tool indeed reflected the intended theoretical model, demonstrating strong internal consistency between its different dimensions. Our research found that the Arabic version of the physical education e-learning readiness assessment scale is a reliable and valid tool for measuring e-learning readiness in various education disciplines. physical. The scale (Alem, 2013) showed notable temporal stability and internal consistency in our study. These results are consistent with other research studies. The study of (ALLOUCHE & ZOUAOUI, 2023), the study of (Léger, 2022), whose objective is to determine whether preparation for self-directed learning (SDLR) among online students can be predicted in a manner meaningful through motivation, creativity and feelings of competence. On the other hand, the study by (Solís Molero, 2023) aims to determine the effect of preparation for online learning on engagement in learning and to discover which aspects have the greatest influence.

However, the study by (OUZIF & EL BOUKHARI, 2023) also indicated results inconsistent with our study. These results mention the impact of the level of education on the perception of difficulties in using ICT in the academic environment.

Our results indicate that the Arabic version of the e-learning readiness assessment scale in physical education is a valid and reliable tool for assessing e-learning readiness among students from different disciplines and backgrounds. two sexes. The data presented here show that the Physical Education Online Learning Rating Scale demonstrated strong internal consistency and temporal stability. This study aims to determine the effect of online learning preparation on engagement in learning and to discover which aspects have the greatest influence. It is designed as correlational research, carried out using a questionnaire. The research sample was composed of 640 students from schools in different Tunisian regions. The online learning readiness assessment includes four dimensions:

feelings of competence, motivation, self-directed learning, and perceived usefulness.

The results of the EFA revealed that this scale faithfully reflected the anticipated theoretical model, particularly in terms of homogeneity of the items, and presented remarkable internal consistency for each of the extracted dimensions.

The CFA results demonstrated an excellent fit to the theoretical model, effectively validating the four-dimensional factorial structure with a population of Tunisian high school students. However, our study encountered certain limitations. Furthermore, validation in the Arab context could be affected by the specific cultural nuances of the Arab world. It is therefore essential to extend this validation to other countries in order to account for cultural variations and to assess the general extensibility of the results for students.

*** Conclusion**

The objective of our study was to adapt and evaluate the factor structure, internal consistency/reliability, predictive validity, and sensitivity of the scale to assess online learning readiness in the field of physical education. Our results indicate excellent internal consistency, good temporal stability (test-retest reliability), robust correlation matrix, effective factor loadings in the EFA, and satisfactory fit indices in the CFA. Additionally, sensitivity analysis examined the effects of variables such as age, gender, and education level on scores in different domains. Based on these results, we can state that this scale is a reliable psychometric tool suitable for the quantitative assessment of e-learning readiness in physical education among Arabic-speaking student populations. However, given the limitations mentioned, further research is essential. Future studies should involve more diverse samples from different Arabic-speaking countries.

*** Acknowledgments**

We would like to thank all the persons for their time and effort in helping us finish the study, as well as all the athletes who participated in the research.

*** References**

Alem, F. (2013a). Développement et validation d'un instrument de mesure de E-Learning Readiness dans le contexte universitaire.

Alem, F. (2013b). Développement et validation d'un instrument de mesure de e-Learning readiness dans le contexte universitaire/thèse présentée

comme exigence partielle du doctorat en administration des affaires par Farid Alem ; [directeur de recherche, Michel Plaisent].

ALLOUCHE, M., & ZOUAOUI, I. Z. I. (2023). Impact de l'intégration des TIC sur la motivation à apprendre des étudiants. Innovation, Technologies, Education et Communication (6).

Ansari, J. A. N., & Khan, N. A. (2020). Exploring the role of social media in collaborative learning the new domain of learning. *Smart Learning Environments, 7*(1), 1-16.

Archer, G., Saltelli, A., & Sobol, I. M. (1997). Sensitivity measures, ANOVA-like techniques and the use of bootstrap. *Journal of Statistical Computation and Simulation, 58*(2), 99-120.

Astari, S., & Kartika, R. (2022). *Blended Learning in Intermediate Accounting I.* Paper presented at the 4th International Conference on Educational Development and Quality Assurance (ICED-QA 2021).

Beaton, D. E., Bombardier, C., Guillemin, F., & Ferraz, M. B. (2000). Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine (Phila Pa 1976), 25*(24), 3186-3191. Doi :10.1097/00007632-200012150-00014

Bernier, V. (2016). *Effets d'un projet de formation-accompagnement sur le sentiment d'efficacité collective à prévenir et gérer les comportements difficiles au primaire.* Université Laval.

Bouletreau, A., Chouaniere, D., Wild, P., & Fontana, J. M. (1999). *Concevoir, traduire et valider un questionnaire. A propos d'un exemple, EUROQUEST*. Retrieved from https://hal-lara.archives-ouvertes.fr/hal-01420163

Charlier, B., Deschryver, N., & Peraya, D. (2006). Apprendre en présence et à distance : une définition des dispositifs hybrides. *Distances et savoirs, 4*(4), 469-496.

DESBIENS, J.-F., Naila, B., SPALLANZANI, C., VANDERCLEYEN, F., & BEAUDOIN, S. (2018). Validation d'un instrument pour mesurer les préoccupations d'enseignants stagiaires en ÉPS tunisiens. *Anadolu University Journal of*

Education Faculty, 2(2), 158-177.

Dharma, F. A., Andriati, R., Hariyanto, D., & Fediyanto, N. (2023). *Online Prostitution Among Millennials: A Consequence of Westernized Lifestyles?* Paper presented at the International Conference on Intellectuals' Global Responsibility (ICIGR 2022).

Edwards, S. D., Ngcobo, H. S., Edwards, D. J., & Palavar, K. (2005). Exploring the relationship between physical activity, psychological well-being and physical self-perception in different exercise groups. *South African Journal for Research in Sport, Physical Education and Recreation, 27*(1), 59-74.

El Louadi, M. (2001). Le coefficient de fiabilité et la multidimentionalité des mesures en systèmes d'information. *Université de Tunis*.

Facon, B. (2007). Sur la différenciation des aptitudes cognitives de l'enfant. *European Review of Applied Psychology, 57*(4), 213-223. doi:https://doi.org/10.1016/j.erap.2006.10.002

Fraser, B. J., & Treagust, D. F. (1986). Validity and use of an instrument for assessing classroom psychosocial environment in higher education. *Higher education, 15*(1-2), 37-57.

Gana, K., Broc, G., Boudouda, N. E., Calcagni, N., & Ben Youssef, S. (2020). The ITC guidelines for translating and adapting tests (second edition). *Pratiques Psychologiques*. Doi : 10.1016/j.prps.2020.06.005

Genoud, P. (2008). Validation d'un instrument mesurant le climat d'études perçu par les étudiants universitaires. *Mesure et évaluation en éducation, 31*(1), 31-49. Doi :https://doi.org/10.7202/1025012ar

Kalajas-Tilga, H., Koka, A., Hein, V., Tilga, H., & Raudsepp, L. (2020). Motivational processes in physical education and objectively measured physical activity among adolescents. *Journal of Sport and Health Science, 9*(5), 462-471. doi:https://doi.org/10.1016/j.jshs.2019.06.001

Khadir, M. (2021). Analyse critique des modèles de succès des systèmes d'information en vue

de la proposition d'un modèle conceptuel de la continuation d'utilisation.

Moore, J. L., Dickson-Deane, C., & Galyen, K. (2011). e-Learning, online learning, and distance learning environments: Are they the same? *The Internet and Higher Education, 14*(2), 129-135. doi:https://doi.org/10.1016/j.iheduc.2010.10.001

OUZIF, H., & EL BOUKHARI, H. (2023). L'impact du niveau d'éducation sur la perception des difficultés d'utilisation des TIC dans l'environnement académique. Revue Internationale de la Recherche Scientifique (Revue-IRS), 1(6), 1131-1143.

Prihastiwi, W. J., & Antawati, D. I. (2023). *Anger Management Intervention with Cognitive-Behavioral-Spiritual Approach (SC-Spri) in Adolescents with Behavioral Problems.* Paper presented at the 1st UMSurabaya Multidisciplinary International Conference 2021 (MICon 2021).

Prihastiwi, W. J., Prastuti, E., & Eva, N. (2020). E-Learning readiness and learning engagement during the Covid-19 pandemic. *KnE Social Sciences*, 236–243-236–243.

Rasheed, M. I., Malik, M. J., Pitafi, A. H., Iqbal, J., Anser, M. K., & Abbas, M. (2020). Usage of social media, student engagement, and creativity: The role of knowledge sharing behavior and cyberbullying. *Computers & Education, 159*, 104002. doi:https://doi.org/10.1016/j.compedu.2020.104002

Rohr, L. E., Costello, J., & Hawkins, T. (2015). Design Considerations for Integrating Twitter into an Online Course. *International Review of Research in Open and Distributed Learning, 16*(4), 241-249. doi:https://doi.org/10.19173/irrodl.v16i4.2376

Satorra, A., & Bentler, P. M. (1994). Corrections to test statistics and standard errors in covariance structure analysis.

Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of psychological research online, 8*(2), 23-74.

Shariff, S. (2005). Cyber-dilemmas in the new millennium: School obligations to provide student safety in a virtual school environment. *McGill Journal of Education/Revue des sciences de l'éducation de McGill, 40*(3).

Wallace, J., Scanlon, D., & Calderón, A. (2023). Digital technology and teacher digital competency in physical education: a holistic view of teacher and student perspectives. *Curriculum Studies in Health and Physical Education, 14*(3), 271-287.

Léger, M. T. (2022). Apprendre à être créatif : une étude comparative du développement de la créativité comme compétence numérique en milieu d'apprentissage riche en technologies. *Revue hybride de l'éducation, 6*(1), 125-147.

Solís Molero, N. (2023). L'IMPORTANCE D'UNE BONNE UTILISATION DES TIC EN CLASSE POUR L'APPRENTISSAGE DU FLE.