Eurasian Studies in Business and Economics 19
Series Editors: Mehmet Huseyin Bilgin · Hakan Danis

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Hakan Danis
Ender Demir
Conrado Diego García-Gómez *Editors*

Eurasian Business and Economics Perspectives

Proceedings of the 32nd Eurasia Business and Economics Society Conference

Springer

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Editors

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Preface

This is the 19th issue of the Springer's series **Eurasian Studies in Business and Economics**, which is the official book series of the Eurasia Business and Economics Society (EBES, www.ebesweb.org). This issue includes selected papers presented at the 32nd EBES Conference that was held on August 5–7, 2020. Due to the COVID-19 pandemic, the conference presentation mode has been switched to "online/virtual presentation only."

We are honored to have received top-tier papers from distinguished scholars from all over the world. We regret that we were unable to accept more papers. In the conference, *184* papers were presented and *355* colleagues from *49* countries attended the online conference. Distinguished scholar **Jonathan Batten** from RMIT University, Australia; **Klaus F. Zimmermann** from EBES, GLO, UNU-MERIT and Maastricht University, The Netherlands; **Marco Vivarelli** from Universita Cattolica del Sacro Cuore in Milano, Italy; and **Dorothea Schäfer** from DIW Berlin, GLO, and Jönköping University, Sweden joined the ***KEYNOTE SESSION*** entitled "How COVID-19 can help us build a better society." Moreover, EBES Executive Board selected ***Asli Demirguc-Kunt***, Chief Economist, Europe and Central Asia Region, The World Bank, USA as the EBES Fellow Award 2020 recipient for her academic achievements and invaluable contributions to financial development, banking, and financial inclusion.

In addition to publication opportunities in EBES journals (*Eurasian Business Review* and *Eurasian Economic Review*, which are also published by Springer), conference participants were given opportunity to submit their full papers for this Issue. Theoretical and empirical papers in the series cover diverse areas of business, economics, and finance from many different countries, providing a valuable opportunity to researchers, professionals, and students to catch up with the most recent studies in a diverse set of fields across many countries and regions.

The aim of the EBES conferences is to bring together scientists from business, finance, and economics fields, attract original research papers, and provide them publication opportunities. Each issue of *the Eurasian Studies in Business and Economics* covers a wide variety of topics from business and economics and

provides empirical results from many different countries and regions that are less investigated in the existing literature. All accepted papers for the issue went through peer-review process and benefited from the comments made during the conference as well. The current issue is entitled "Eurasian Business and Economics Perspectives" and covers fields such as education, human resources management, management, banking, finance, economics of innovation, and regional studies.

Although the papers in this issue may provide empirical results for a specific county or regions, we believe that the readers would have an opportunity to catch up with the most recent studies in a diverse set of fields across many countries and regions and empirical support for the existing literature. In addition, the findings from these papers could be valid for similar economies or regions.

On behalf of the series editors, volume editors, and EBES officers, I would like to thank all the presenters, participants, board members, and keynote speakers, and we are looking forward to seeing you at the upcoming EBES conferences.

Best regards

Reykjavik, Iceland Ender Demir

Eurasia Business and Economics Society (EBES)

EBES is a scholarly association for scholars involved in the practice and study of economics, finance, and business worldwide. EBES was founded in 2008 with the purpose of not only promoting academic research in the field of business and economics but also encouraging the intellectual development of scholars. In spite of the term "Eurasia," the scope should be understood in its broadest term as having a global emphasis.

EBES aims to bring worldwide researchers and professionals together through organizing conferences and publishing academic journals and increase economics, finance, and business knowledge through academic discussions. Any scholar or professional interested in economics, finance, and business is welcome to attend EBES conferences. Since our first conference in 2009, around *13,447* colleagues from *99* countries have joined our conferences and *7587* academic papers have been presented. **EBES has reached 2470 members from 87 countries.**

Since 2011, EBES has been publishing two journals. One of those journals, ***Eurasian Business Review***—*EABR*, is in the fields of industrial organization, innovation, and management science, and the other one, ***Eurasian Economic Review***—*EAER*, is in the fields of applied macroeconomics and finance. Both journals are published quarterly by ***Springer*** and indexed in ***Scopus***. In addition, EAER is indexed in the ***Emerging Sources Citation Index*** (*Clarivate Analytics*) and EABR is indexed in the ***Social Science Citation Index (SSCI)*** with an impact factor of **3.5** as of 2020.

Furthermore, since 2014 Springer has started to publish a new conference proceedings series (**Eurasian Studies in Business and Economics***)* which includes selected papers from the EBES conferences. The series has been indexed by **SCOPUS**. In addition, the 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th, 18th, 19th, 20th (Vol. 2), 21st, and 24th EBES Conference Proceedings have already been accepted for inclusion in the ***Conference Proceedings Citation Index-Social Science and Humanities (CPCI-SSH).*** Other conference proceedings are in progress.

We look forward to seeing you at our forthcoming conferences. We very much welcome your comments and suggestions in order to improve our future events. Our success is only possible with your valuable feedback and support!

With my very best wishes,

Klaus F. Zimmermann
President

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Part I
Eurasian Business Perspectives: Education

Validity and Reliability of the Flipped Learning Scale

Osman Yildirim, Liubov Smoliar, Olha Ilyash, and Dariia Doroshkevych

Abstract Digital transformation requires restructuring in all areas of life and getting used to the new normal. Education is also greatly affected by digital transformation. In higher education, while learning and teaching styles change, educational environments also change according to the requirements of digital transformation. Flipped learning is becoming increasingly important from lifelong learning to university education. Therefore, a scale validity and reliability study on flipped learning are aimed at the study. In order to achieve this purpose, linguistic validity, time validity, and pilot application are performed with the survey items. The research survey is conducted on 500 participants by the easy sampling method. Based on research findings, the 4-factor structure of the flipped learning scale is confirmed since the test values and fit index values (GFI, CFI, SRMR, RMSEA) of the research model are within acceptable limits. In higher education, E-Learning applications are increasing in parallel with digitalization. In particular, new applications (robots, internet of things, augmented reality, etc.) that come with Industry 4.0 included not only theoretical courses but also laboratory applications within the scope of E-Learning. This research aimed to draw the interests and attention of educators and education professionals to the ways of evaluating virtual learning environments and styles.

Keywords Flip scale · Flipped learning · Validity · Reliability

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1 Introduction

Education is a very important subject that must be emphasized. In the enterprises, especially the development trainings or achievement development of business objectives in a short time are researched. In other words, there is quite a lot of confusion over the realization of the return on investment in education. Again, new learning methods for the education quality in higher education, the effectiveness of education, or transfer of education are being investigated with great interest. Flipped learning finds application in both business education (certification) and higher education.

In higher education, E-Learning applications have started to increase in parallel with digitalization. In particular, new applications (robots, internet of things, augmented reality, etc.) that come with industry 4.0 have included not only theoretical courses but also laboratory applications within the scope of E-Learning. For example, by means of augmented reality, the internal organs of the human body and the detailed internal structure of each of these organs are served to students in a virtual environment.

Digital learning environments, sometimes called "Flipped Classroom" and sometimes "Blended Learning" in the literature, are predicted to become more widespread with the compulsions of Covid-19-like pandemics. Measuring effectiveness in flipped classroom or blended learning patterns has become of paramount importance. In other words, it has become necessary to evaluate these new learning and teaching styles and related learning environments. For this reason, it required the students to watch the course content online, watch the lecture videos at home, and move the learning process to an individual area.

Flipped classroom is defined as a model in which traditional lesson activity is reversed. Before the lesson, students should consider the items related to the lesson (lecture presentation, homework, video, reading passages, exam questions, etc.). In this way, they learn most of the learning event without contacting the instructor of the course (Lage et al., 2000; Anderson & Krathwohl, 2001). Flipped learning model is the key opportunity to increase active learning and provides a large learning space for students. This learning style supports the effectiveness of education and increases the students' achievement (Prince, 2004). In few studies conducted on students studying in higher education, it is also found that the flipped learning model does not satisfy the students (Strayer, 2012).

There are studies in the literature that reveal the effects of the flipped learning and teaching model on students and students' learning motivations (McLaughlin et al., 2014; Gilboy et al., 2015; Koo et al., 2016). In the relevant literature, there have been many studies investigating the benefits of the flipped learning method in recent years (Keene, 2013; Davies & West, 2013; Siegle, 2014; Borup et al., 2012). The flipped learning is a teaching method in which students examine course materials before, during, and after class to maximize learning activity. Before the course, each student can access the course materials (text, powerpoint slides, video, test questions, etc.)

on the internet (Bergmann & Sams, 2012; Davies & West, 2013; Frydenberg, 2013; Copley, 2007; Kay & Kletskin, 2012; Vajoczki et al., 2010).

It was suggested that the requirements of Bloom's full learning theory could be met by trying to organize classroom learning environments according to the flipped learning approach (Sams & Bergmann, 2012). Thoms (2013) investigated the effect of the flipped learning approach on students' detailed learning level. The flipped learning approach, which imposes new responsibilities on teachers and students, is closely related to the fulfillment of individual responsibilities by both parties. It has been pointed out that the responsibility of the teacher is more than the traditional approach in order to achieve healthy learning in flipped learning (McLaughlin et al., 2013). Flipped learning classroom training started as a kind of desk work in order to create a database by collecting the conceptual foundations and the terminology used, and the flipped learning approach was analyzed with the collected data. According to the data collected, flipped learning approaches were put forward by dividing them into sections to be opened to individual learning in classroom activities and technological environments (Wolff & Chan, 2015). Computerized education that goes outside the classroom is defined as individual learning and expressed as a personalized form of education (Sams & Bergmann, 2014; Butt, 2014).

The basic elements of the flip method are (1) enabling students to access the course, (2) encouraging students to prepare for the course, (3) establishing a mechanism that evaluates student understanding, and (4) planning activities for active learning (Kay & Kletskin, 2012; Warter-Perez & Dong, 2012; Bates & Galloway, 2012; Brame, 2013; Sarawagi, 2014; Abeysekera & Dawson, 2015; Ilyash & Lupak, 2016). Flipped learning is the use of digital tools that provide enhanced student engagement, where the teacher shows videos to convey content and takes a more active role in lecturing. Based on a social application model, they create a structure that allows integration with technology (Beach et al., 2016; Frolova et al., 2021). The flipped learning approach has had an impact on students' speaking skills, motivation, and learning outcomes (Jones et al., 2019; Zarrinabadi & Ebrahimi, 2019; Haghighi et al., 2019). In the inverted learning model, classroom studies are mostly based on active learning. Out-of-class studies are organized as video watching or computer-based studies. With flipped learning, the traditional learning method has been frequently researched academically (Fraga & Harmon, 2014; AlJaser, 2017). With their meta-analysis study, Hew and Lo (2018) tried to measure the academic success of healthcare students using the flipped learning approach.

2 Methodology

Face-to-face questionnaires were applied to 500 students who received undergraduate education (nursing, physical therapy, health management, child development) in the field of health, who accepted voluntary participation in the survey. For the research, a target audience who is familiar with online courses and who is assumed to be using computers in their classes was chosen. The opinions of healthcare

professionals, who voluntarily accepted to participate in the survey with easy sampling method, about flipped learning were investigated.

The questionnaire was adapted from the original statements on the Flipped Learning Network website (FLN, 2014). Participants were asked to score each 5-point Likert scale ranging from 1 (Strongly Agree) to 5 (Strongly Agree). For the validity and reliability study of the flipped learning scale, language validity, time validity, pilot application, field application, internal consistency and reliability, exploratory factor analysis for validity, confirmatory factor analysis and reliability, composite reliability, convergent validity, decomposition validity, and explained mean variance values were analyzed.

The English expressions of the Flipped Learning scale were translated from English to Turkish by one of two experts in the field of English Language and Literature. Later, the other expert translated this translation text back from Turkish into English. Translation and retranslation are intended to prevent slippage in translations. In order to understand whether the expressions of the scale were understood correctly, a pilot study was conducted with a volunteer person between the ages of 20 and 30. Reliability and internal consistency coefficient were measured with Cronbach's alpha value (Brislin et al., 1973).

3 Results

The difference between the demographic values in both groups can be considered identical because the gender ($p > 0.05$) and age groups ($p > 0.05$) were used in the difference tests. Reliability value obtained from the two groups Cronbach's alpha value is "high reliability". Since the value 0.928 for the first translation is slightly higher than the value for the second translation, it is the first translation to be preferred for the actual application.

The corrected item-total correlation values (>0.912) and reliability (Cronbach's alpha) values (<0.928) were found for all items, under the condition that the item was deleted (Table 1).

Table 1 Results from groups where two different translations were applied

Translation number	Number of items	Number of participants	Gender	Age	Cronbach's alpha
1	11	40	F (19); M (21)	26 ± 1.2	0.928
2	11	40	F (22); M (18)	25 ± 0.9	0.912
p	–	–	>0.05[a]	>0.05[b]	–

Source: Authors own study
Note: [a] Independent test p value, [b] Chi-square test p value

3.1 Time Validity

After the pilot application for language validity, the same 40 participants were interviewed and the same translation text was used again 20 days later. At the end of this application, the Cronbach's alpha value (0.924) was determined. Therefore, it was decided that the validity of the test-retest result for the first translation was very close (0.928) in the first application and (0.924) in the second application.

3.2 Piloting

The first translation, whose language validity and time validity was ensured, was piloted with 10 times the number of participants (110 students). With this application, it is aimed to examine the reliability values when the substance is deleted. With the pilot application, it will be tried to ensure that the translations of the substances that increase the reliability of the scale when deleted are more understandable in the actual application. The following reliability values were obtained in the pilot study performed on 49 females and 61 males. The findings related to the pilot application are shown in Table 2.

3.3 Field Application

Following the final arrangements, field application was carried out on 500 participants. Using the easy sampling method, a questionnaire was applied to 525 people

Table 2 Reliability values obtained in pilot application

Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's alpha if Item Deleted
fl1	36.782	86.814	0.777	0.951
fl2	36.700	87.111	0.827	0.949
fl3	36.791	86.240	0.841	0.949
fl4	36.782	88.025	0.796	0.950
fl5	36.755	88.315	0.790	0.950
fl6	36.618	89.339	0.753	0.952
fl7	36.845	87.545	0.784	0.951
fl8	36.618	88.550	0.788	0.951
fl9	36.855	89.116	0.734	0.952
fl10	36.682	87.980	0.754	0.957
fl11	36.755	88.187	0.777	0.951
Total	**Cronbach's alpha**			**0.955**

Source: Authors own study

Table 3 Demographic characteristics of the participants

Demography		N	%
Gender	Male	216	43.2%
	Female	283	56.8%
Age	<20	119	23.8%
	20–25	381	76.2%
Academic credits	= < 2	55	11.0%
	2–3	343	68.6%
	3–4	102	20.4%
Field	Nutrition	2	0.4%
	Psychology	2	0.4%
	Child development	6	1.2%
	Psychotherapy	8	1.6%
	Nursing	469	93.8%
	Health management	13	2.6%

Source: Authors own study; N: number of participants

Table 4 Reliability and internal consistency values

Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's alpha if Item Deleted
fl1	38.867	70.152	0.676	0.933
fl2	38.778	70.933	0.726	0.931
fl3	38.762	70.557	0.753	0.930
fl4	38.853	70.380	0.729	0.931
fl5	38.764	69.874	0.769	0.929
fl6	38.752	70.833	0.703	0.932
fl7	38.813	70.201	0.740	0.930
fl8	38.718	70.854	0.714	0.931
fl9	38.813	69.991	0.753	0.930
fl10	38.716	70.677	0.755	0.930
fl11	38.677	70.474	0.725	0.931
Total	**Cronbach's alpha**			**0.937**

Source: Authors own study; N: number of participants

face-to-face between September 2020 and October 2020. However, 25 questionnaires were excluded from the evaluation because they were not fully completed. The response rate of the subjects was 95%. Demographic characteristics of the participants in the application are given in Table 3. Internal consistency and reliability values are shown in Table 4.

Since the reliability value calculated for 11 items is (0.937), the structure has a high degree of reliability. In terms of size, Flexible Environment (0.853), Learning Culture (0.778), Intentional Content (0.823), and Professional Educator (0.853) were found.

3.4 Exploratory Factor Analysis for Validity

By using exploratory factor analysis, factor number and factor structure are defined. Exploratory factor analysis is a variable reduction technique that defines the underlying factor structure and the number of implicit structures of a variable set. This technique is a hypothesis of a variable that cannot be directly measured, predicts the factors that affect the responses on observed variables, allows you to define and describe the number of implicit structures (factors), and includes error and specific factors that result from unreliability in measurement (Suhr, 2006). At the same time, exploratory factor analysis has traditionally been used to investigate the possible factor substructure of the variable set measured without creating any biased structure on the result (Child, 1990).

In exploratory factor analysis shown in Table 5, the researcher may not have any specific expectations regarding factors or factor infrastructure. Even if the researcher has such expectations, exploratory factor analysis does not require the researcher to declare these expectations and the analysis is not affected by these expectations (Thompson, 2004).

Table 5 Factor analysis for FLIP scale

Factors	Items	FL	FA (%)
Flexible environment (F)	fl1. I provide students with different ways to learn content and demonstrate mastery.	0.812	21.34
	fl2. I continually observe and monitor students to make adjustments as appropriate.	0.806	
	fl3. I establish spaces and time frames that permit students to interact and reflect on their learning as needed.	0.518	
Learning culture (L)	fl4. I scaffold these activities and make them accessible to all students through differentiation and feedback.	0.581	12.23
	fl5. I give students opportunities to engage in meaningful activities without the teacher being central.	0.518	
Intentional content *(I)*	fl6. I differentiate to make content accessible and relevant to all students.	0.817	19.81
	fl7. I create and/or curate relevant content (typically videos) for my students.	0.601	
	fl8. I prioritize concepts used in direct instruction for learners to access on their own.	0.512	
Professional educator *(P)*	fl9. I collaborate and reflect with other educators and take responsibility for transforming my practice.	0.780	9.65
	fl10. I conduct ongoing formative assessments during class time through observation and by recording data to inform future instruction.	0.699	
	fl11. I collaborate and reflect with other educators and take responsibility for transforming my practice.	0.542	

Note: KMO = 0.941, Bartlett's test $p = 0.000$, *FL* factor loading, *FA* factor explanation
Source: Authors own study

In the first stage of the factor analysis, the problem to be investigated is recognized and decided to be suitable. Correlation matrix and factor analysis are investigated with the help of the data. Subsequently, the Kaiser-Meyer-Olkin (KMO) coefficient indicates the suitability of the data structure for factor analysis, while the Barlett Sphericity Test will show the relationship between variables (Jöroskog & Sörbom, 1996; Beavers et al., 2013).

Since the probability value ($p < 0.05$) and KMO were 0.941 for the Bartlett's test with exploratory factor analysis for the FLIP scale, the data set was "excellent" in factor analysis. The explanatory value for the dimensions of the FLIP scale, which includes a total of 11 statements, was 21.34% for the flexible environment (3 items), 12.23% for the learning culture (2 items), 19.81% for intentional content (3 items), and 9.65% for professional educator (3 items). The total concept explanatory value of the scale was 63.03%. With this ratio, it was accepted that the scope validity of the scale has been achieved.

3.5 Confirmatory Factor Analysis (CFA)

With the help of AMOS 22.0, the good fit indexes of the model were investigated and indicated in Table 6 (Bollen, 1989; Fornell & Larcker, 1981; Bagozzi et al., 1999; Byrne, 2011). Bartlett test is important in confirmatory factor analysis. The statistical significance of the correlation matrix is examined by Bartlett test (Hair et al., 2010). In all of the expressions used in the study, it can be said that if the Skewness and Kurtosis values are within ±1.5, the data are normally distributed (Schermelleh-Engel et al., 2003).

In the confirmatory factor analysis for the FLIP scale, which consists of 11 items, factor loadings are in the range of (74; 83). As shown in the literature, the results of the analysis for the 4-factor structure are shown in Fig. 1.

CFA is significant since the model test values are $\times^2$ (108.299), $\times^2$/df (2.77). Since the fit index values of the model (GFI (0.947), CFI (0.975), SRMR (0.0285), RMSEA (0.070)) are within acceptable limits, it is understood that the original 4-factor structure of the FLIP scale can be used exactly (Byrne, 2011). As far as concerned the index values modification between fl2 and fl3 items, it is believed to be appropriate to make this modification putting the MI value and exchange value

Table 6 CFA compliance values

Indices	Good fit	Acceptable fit
χ2 / df	0 ≤×/df ≤ 2	2 < ×2/df ≤ 5
GFI	≥ 0.90	0.85–0.89
CFI	≥ 0.95	≥ 0.90
SRMR	≤0.05	0.06 ≤ SRMR ≤0.08
RMSEA	≤ 0.05	0.06 ≤ RMSEA ≤0.08

Source: Based on Schermelleh-Engel et al. (2003)

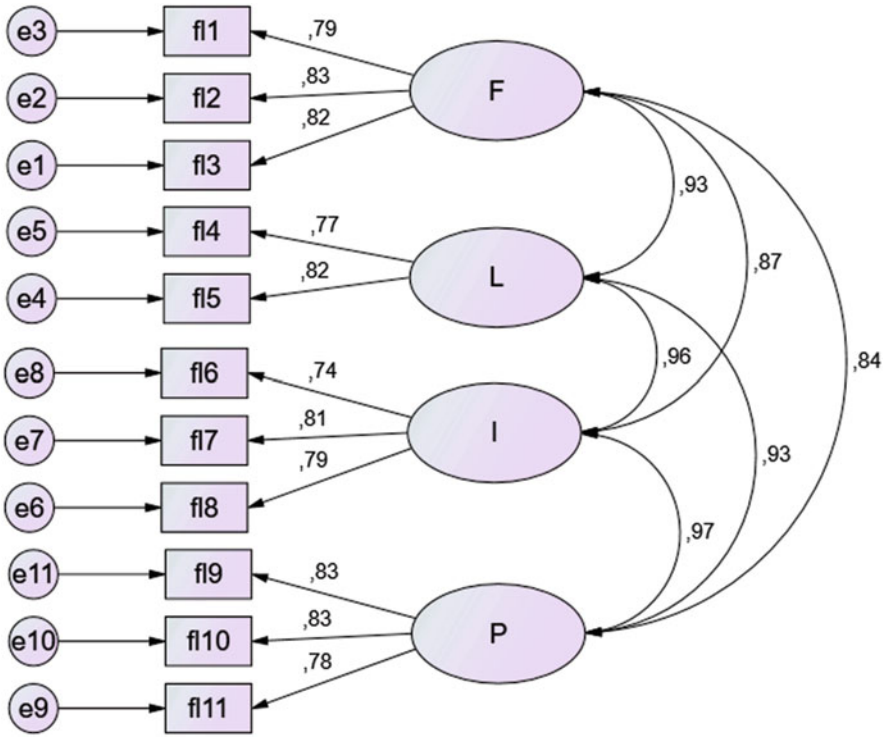

Fig. 1 FLIP scale confirmatory factor analysis first step. Source: authors own study

equal to 15.87 and 0.105. When this modification was made, the following factor analysis results were obtained (Fig. 2).

Since the model test values are ×2 (84.177), ×2/df (2.215), the CFA is acceptable. The model's fit index values (GFI (0.960), CFI (0.983), SRMR (0.0242), RMSEA (0.0580)). It is understood that the covariance modification between the fl2 and fl3 items of the 4-factor structure of the FLIP scale yields better model parameters (Byrne, 2011). Detailed information about the last step is given in Table 7.

It is significant since all the regression coefficients of the last second iteration for confirmatory factor analysis are found ($p < 0.001$). The covariance and correlation values calculated between the factors are given in Table 8.

According to the FLIP scale confirmatory factor analysis, the covariance between the factors F and L with the highest covariance value between factors was 0.731. Then, respectively, between L and I (0.721), between I and P (0.690), between L and P (0.675), between F and I (0.660), and between F and P (0.628) values are obtained. The covariance value calculated between f2 and f3 items (0.166) was found to be positive and significant.

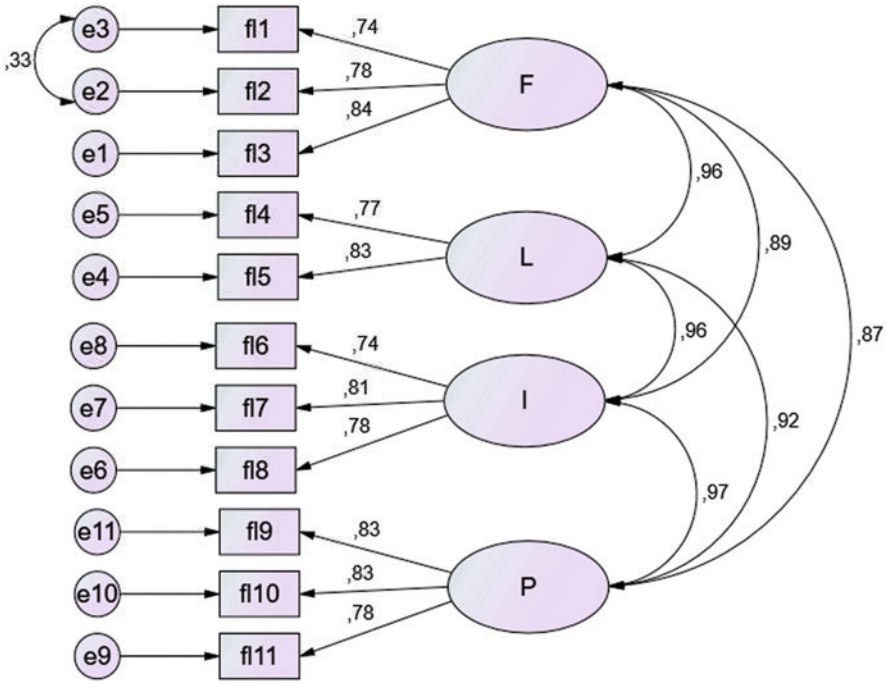

Fig. 2 FLIP scale confirmatory factor analysis second step. Source: authors own study

Table 7 FLIP scale final confirmatory factor analysis results

Ref. (FLN, 2014)			Estimate	Standard Estimate	C.R.	*p*
fl3	<---	F	1.000	0.837		
fl2	<---	F	0.952	0.783	16.640	***
fl1	<---	F	0.985	0.738	15.301	***
fl5	<---	L	1.000	0.829		
fl4	<---	L	0.942	0.769	16.795	***
fl8	<---	I	0.959	0.785	16.913	***
fl7	<---	I	1.000	0.815		
fl6	<---	I	0.923	0.742	15.668	***
fl11	<---	P	1.000	0.782		
fl10	<---	P	0.943	0.830	15.234	***
fl9	<---	P	1.065	0.827	20.832	***

Source: Authors own study $*p < 0.05$, $**p < 0.01$, $***p <$ 0,001. C.R.: critical ratio

Table 8 Covariance and correlation values between FLIP scale factors

			covariance	r	C.R.	*p*
F	<-->	L	0.731	0.963	10.727	***
F	<-->	I	0.660	0.891	10.228	***
F	<-->	P	0.628	0.873	10.554	***
L	<-->	I	0.721	0.958	10.599	***
L	<-->	P	0.675	0.925	10.874	***
I	<-->	P	0.690	0.967	11.060	***
e2	<-->	e3	0.166	0.326	4.470	***

Source: Authors own study $*p < 0.05$, $**p < 0.01$, $***p < 0{,}001$. r:relation, C.R.: critical ratio

Table 9 Correlation, reliability, and decomposition validity values of the dimensions obtained from the parameters used in the study

Flipped Learning Scale (Flip Scale)	F	L	I	*p*
Flexible environment (F)	(0.786)			
Learning culture (L)	0.760^{**}	(0.799)		
Intentional content *(I)*	0.728^{**}	0.768^{**}	(0.780)	
Professional educator *(P)*	0.719^{**}	0.759^{**}	0.778^{**}	(0.813)
Reliability constant (Cronbach's alpha)	*0.853*	*0.778*	*0.823*	*0.853*
Composite reliability (CR)	*0.830*	*0.780*	*0.824*	*0.854*
Average variance extracted (AVE)	*0.619*	*0.639*	*0.610*	*0.661*

$*p < 0.05$, $**p < 0.01$, $***p < 0{,}001$
Source: Authors own study
Note: The values shown in parentheses are the square root values of the AVE calculated to measure

3.6 Reliability, Composite Reliability, Convergent Validity, Decomposition Validity, and Average Variance Extracted

The reliability (Cronbach alpha), composite reliability (CR), and average variance extracted (AVE) values of the research scale were investigated. Composite reliability (CR) values are calculated from factor loads calculated from confirmatory factor analysis. The composite reliability value should be CR $\geq$ 0.70. The indicator of convergent validity is the average variance extracted value (AVE) which should be greater than 0.70. In order to confirm the convergence validity, the mean variance (AVE $\geq$ 0.50) is required (Fornell & Larcker, 1981; Raykov, 1997).

Since the mean explained variance values (AVE $>$ 0.50) for the research scale were convergent, the necessary condition was provided in the convergent validity. The square root values of the calculated AVE values are given in parentheses in Table 9 for the validity of the decomposition. Since these values are higher than all correlation values in that column, it is assumed that the validity of the decomposition is provided for all variables.

The reliability coefficients calculated for the FLIP scale subscales (Flexible Environment (F), Learning Culture (L), Intentional Content (I), Professional Educator (P)) are "high reliability" since Cronbach's alpha is 0.80. The composite

reliability values are greater than 0.70, then it can be stated that the composite reliability requirement is met. The values shown in parentheses in Table 9 are the square root values of the AVE calculated to measure. This value must be greater than the correlation coefficient (Fornell & Larcker, 1981; Raykov, 1997). That is because that all the coefficients meet the requirements about structuring the flipped scale. In other words, this scale will be a new and short scale that can be used in research on flipped learning.

4 Conclusion and Discussion

The development of cloud technology and the virtual learning environments that are increasingly accessible provide educational environments that can contribute to conventional classroom education. FLIP learning technique is also becoming more widespread in the field of higher education after certificate trainings or school trainings. For this reason, FLIP scale reliability and validity study is conducted based on FLN (2014) expressions based on the view of higher education students on FLIP technique. As a result of the statistical analysis, the original structure of the FLIP scale is found to be valid. This scale will be a new and short scale that can be used in research on flipped learning.

For the validity and reliability study of the FLIP scale, language validity, time validity, pilot implementation, field application, internal consistency and reliability, exploratory factor analysis for validity, confirmatory factor analysis, reliability, composite reliability, convergent validity, decomposition validity, and explained mean variance values were analyzed. At the end of these analyses, it was revealed that the original structure of the FLIP scale could be used by the researchers.

The Cronbach's alpha value as the reliability and internal consistency coefficient for language validity was measured and the time validity of the scale was obtained after the pilot application. Following the final adjustments, the field application of the scale was carried out on 500 higher education students. Since the Cronbach's alpha >0.80, CR > 0.70, and AVE > 0.50 for the four-dimensional FLIP scale, convergent validity was provided. Since the model test values and the fit index values are within acceptable limits, the 4-factor structure of the FLIP scale is acceptable. According to the statistical findings, the subscales of FLIP scale, namely, "Flexible Environment (F)", "Learning Culture (L)", "Intentional Content (I)", and "Professional Educator (P)" have been explained by confirmatory factor analysis. The original structure of the FLIP scale was valid.

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Developing Financial Efficiency Index for Higher Education Institutions

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Abstract The decision-making process, as well as general management of the higher education institution, is nowadays becoming more and more complex and complicated; therefore, management of the higher education institution requires modern tools and methods to ensure sustainable development of the organization and to meet different shareholders' interests and necessities. The objective of the current paper is to cover the existing gap and to provide the management of the higher education institution in Latvia with an acceptable financial efficiency measurement tool—financial health index—useful in the process of setting the institution's strategic goals, developing and implementing strategies, as well as performance measurement. The authors are using the methodology of ratio analysis in higher education in Latvia. To solve the weight determination problem, the authors apply findings described. The major advantage of the "new" index is its clear weightings based on the simulation and not one's opinion. So that the kind of approach would lead to the usage of the reliable tool, allowing comparison between different organizations and determination of best practice approach.

Keywords Higher education institutions · Financial health · Efficiency measurement · Latvia

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