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Contents

The effect of COVID-19 pandemic on university education: Adoption of e-learning and testing the technology acceptance model

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Abstract

This study aims to investigate the factors affecting the acceptance of e-learning among university students, especially during the COVID-19 pandemic, and to reveal the factors affecting the reasons for students to use e-learning systems. We adopted the Technology Acceptance Model (TAM) to understand better the adoption of e-learning systems by university students. We gathered data from 716 university students who received distance education during the pandemic and used SPSS 22.0, AMOS 22.0 and SmartPLS 3.3 software to perform statistical analyses. The findings indicate that compatibility is related to perceived ease of use and perceived usefulness. Moreover, attitude is influenced by perceived ease of use and perceived usefulness. The results reveal the importance of perceived ease of use, perceived usefulness, self-learning necessity, and compatibility on intention to use.

Keywords: Technology Acceptance Model, e-learning system, COVID-19 pandemic, new teaching methods, self-learning

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Introduction

Information technology (IT) has the potential to transform how people learn and access information in two significant ways. Primarily, IT enables individuals and organizations to do numerous things they already do faster, more flexibly and efficiently, and with greater access for all. In addition, IT enables people to do things that they cannot already do, or to do them in ways that are significantly different. An entirely new environment and learning experience is made possible by IT that goes well beyond the traditional classroom, curricula, and text-based format to which people have been accustomed (Roca et al., 2006). As e-learning is becoming more common throughout educational institutions, lack of research on the acceptance of such technology by students has attracted attention since acceptance is a critical factor for success of implementation (Roca et al., 2006). Indeed, like any other information system, the success of e-learning depends largely on user satisfaction and other factors that will eventually increase users' intention to continue using it.

During the lockdowns as part of pandemic control strategies, students were forced to spend long periods of time at home and compelled to receive distance education. In this period, various new e-learning systems have been developed to help students continue their education at home. In this context, we aim to investigate the factors affecting the acceptance of e-learning among university students, especially during the COVID-19 pandemic, and to reveal the factors affecting the reasons that students willingly use e-learning systems. To this end, we used AMOS software to conduct a path analysis (structural equation modelling), which aligns with studies based on technology acceptance models.

Conceptual and theoretical background

In the current literature, diverse terms such as e-learning, online learning, and web-based learning have been used to explain the teaching and learning experiences performed via the internet and web technology (Khan, 2005). E-learning differs from education in the classroom in terms of procedure, duration, interaction, motivation, etc. These kinds of differences require novel theoretical tools to analyze the new education system. The Technology Acceptance Model (TAM) holds a strong promise to elaborate the e-learning behavior of students, as the model focuses on individuals' perceptions and attitudes toward technological tools.

TAM was introduced by Davis and colleagues (1989) to explain the acceptance and usage of information technologies. The model originated in the Theory of Reasoned Action (TRA) developed by Fishbein and Ajzen (1975) in Social Psychology. TRA is a general system designed to explain almost every type of human behavior and the importance of individual beliefs to predict human conduct (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). TAM focuses exclusively on the analysis of information technology (Venkatesh, 2000) and, as

opposed to TRA models, to preestablish those factors that condition user attitude towards innovation, behavioral intention, and intensity of system usage. The two key factors in determining intention are perceived usefulness (PU) and perceived ease of use (PEOU). These factors predict the development of innovation and are present in all studies on TAM development (Davis et al., 1989).

The Technology Acceptance Model (TAM) is considered to be a keen model that can establish strong relationships through the fewest possible variables. The perceived ease of use and perceived usefulness in the model can give an idea about where information systems designers should focus on during the design of the system (Taylor & Todd, 1995). In this manner, we have included these variables in the original model in order to give an idea to people who build e-learning systems. Indeed, Fishbein & Ajzen (1975) showed that attitudes affect the intention to act, and they revealed that behavior is formed after the belief, attitude and intention about that behavior. On the other hand, since the pandemic is an unusual situation, we used the original version based on the idea that use of e-learning systems could greatly affect attitudes and behaviors about the usage.

Tung and Chang (2008a) combined TAM and TDI (Theory of Diffusion of Innovations) and they added the perceived financial cost and computer self-confidence variables to the model. According to the results of their study, in which 267 nursing students participated, the use of e-learning (distance education), compatibility, perceived benefit, perceived ease of use, perceived financial cost and self-confidence in computer are critical factors affecting the intention to use websites. Among the influencing factors, compatibility was found to be the most important variable. Also, compatibility and perceived ease of use variables have positive effects on perceived benefit. Chang and Tung (2008) added the perceived system quality and computer self-confidence variables to the model in which they combined TAM and TDI, and they examined the use of e-learning (distance learning) of 247 undergraduate students. Their results indicate that the intention to use is affected mostly by self-confidence about computers. According to a study conducted by Murillo et al. (2021), Moodle is seen as the most widely used learning management system. They performed a meta-analysis on 24 TAM based studies in which the use of Moodle was examined. The findings point out that important gaps exist in TAM that need to be addressed in order to study Moodle. However, TAM continues to be used as a robust tool.

Another theory used in studies related to IT systems is innovation diffusion theory (IDT) (Moore & Benbasat, 1991). Innovation is "an idea, practice, or object that is perceived as new by an individual" (p. 16) and diffusion is "the process by which an innovation is communicated through certain channels over time among the members of a social system" (Rogers, 2003, p. 49). Rogers (2003) identified that IDT has five significant characteristics: relative advantage, compatibility, complexity, trialability and observability. The characteristics of IDT can be used to explain user adoption (Wu & Wang, 2005).

TAM, TRA and IDT are the most influential models in the field of information technology (Venkatesh et al., 2007). TAM's focus on information technology systems, its basis on social

psychology, and the verification of the effectiveness of the variables used in the model in different studies provide great advantages to the model (Elwood et al., 2006).

Research design and hypotheses

TAM is one of the most effective models used to explain system usage and user behavior (Venkatesh & Davis, 2000). Although TAM is a useful theoretical model in explaining and understanding the behavior of users in using information technologies, it has been suggested that the model should be expanded by adding new variables to include individual and social factors (Legris et al., 2003). The original model developed by Davis (1989) consists of perceived ease of use, perceived usefulness, attitude, behavioral intention, and actual use. In the original version of the model, perceived usefulness and perceived ease of use were defined as determinants of attitude, and attitude and perceived usefulness were defined as determinants of intention to use (Davis, 1989). However, perceived ease of use and perceived usefulness are stated as the two most important variables explaining the intention to use (Wu & Wang, 2005).

Until this study, a few studies have been performed to exhibit which model consistently outperforms the other in explaining or predicting behavior (Mathieson, 1991). However, some studies indicate that TAM is better than other models in predicting the intention to use information technologies. For example, Gentry and Calantone (2002) examined online shopping behaviors of students and online purchase use intention with three different models, concluding that TAM explained the intention to use better than the other models. TAM is used in many studies because it focuses mainly on the use of information systems, its source is based on social psychology, and the reliability of the variables used in the model is confirmed in many studies. Based on all these inferences, TAM appears to be a more suitable model for examining the use of a technological system such as e-learning.

The original TAM has been criticized for considering the use of technology completely dependent on the will of the user. However, the intention to use in different situations might vary. For example, even if individuals decide to use a particular system, they may not be able to access the necessary resources or equipment, or they may not be able to use the system due to some constraints that are not under their control (Mathieson et al., 2001). Indeed, in their studies Mathieson et al. (2001) preferred to improve the model by adding new variables in order to be able to make more comprehensive explanations. In a similar way, we consider that the fear of pandemic and the need for self-learning might be the underlying reason for university students to begin to use the e-learning system, and therefore, we designed an integrated model by adding these variables.

Some studies (Barnes & Huff, 2003; Wu & Wang, 2005) indicate that the compatibility variable in IDT positively affects the system adaptation rate. Compatibility has also been shown to be one of the most important variables in explaining intention to use (Wu & Wang,

2005). Compatibility is the degree to which an adapted innovation is relevant to what individuals are doing (Barnes & Huff, 2003). For this reason, we integrated the compatibility variable to the research model to explain effectively the usage intention of e-learning systems. The basis of the model was formed by combining the compatibility variable in IDT with TAM. Later, the model was developed by adding fear of coronavirus and self-learning necessity variables to the model for human and social factors. The research model developed is shown in Figure 1, below.
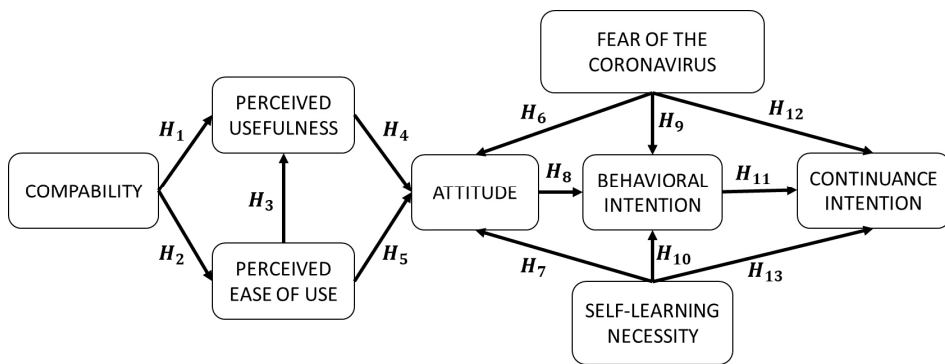
Figure 1 Conceptual model based on technology acceptance

Compatibility

Compatibility is defined as "a degree to which an innovation is perceived as users find new technology in compatibility with their past value, experience, and needs" (Rogers, 2003, p. 21). Studies examining the use of many new technologies have shown the relationship between compatibility, and perceived usefulness and perceived ease of use. For example, in their study examining the acceptance of use of distance nursing education systems, Tung & Chang (2008b) found that compatibility has significant effects on perceived usefulness and intention to use. Chang and Tung (2008b) explained the acceptance of distance education websites usage, and they showed that the compatibility has a direct effect and an indirect effect through perceived usefulness.

Users generally consider the systems that are compatible with their working styles and methods as more useful and easier to use. A system's incompatibility with the way a user works requires a long learning process. This may lead to a decrease in the perception of ease of use (Chau & Hu, 2001). It is likely that the sudden execution of e-learning due to COVID-19 makes compatibility important for students, as each student has different levels of computer skills. Therefore, compatibility plays an essential role for perceived usefulness and perceived ease of use of e-learning systems. Based on this information, the following hypotheses were formed.

H₁: *Compatibility of e-learning systems significantly increases the perceived usefulness of the system.*

H₂: *Compatibility of e-learning systems significantly increases the perceived ease of system use.*

Perceived ease of use and usefulness

The variable of perceived ease of use is expressed as "the degree to which an individual perceives the effort required to use a certain system." Perceived ease of use is also defined as the effort required by the user to benefit from a system (Davis, 1989). A person's belief that they will use the system without difficulty affects their decision to use new information technology. Studies in the literature have shown that perceived ease of use has a significant effect on perceived usefulness (Tung et al., 2008; Venkatesh & Davis, 2000). In the light of these findings, the following hypothesis was formed:

H₃: *Perceived ease of use of e-learning systems significantly increases perceived usefulness of system.*

Perceived usefulness (PU) is defined as the "degree to which an individual believes that using a particular system would enhance his or her performance" (Davis, 1989). Davis and colleagues (1989) concluded that perceived usefulness is a major determinant of behavioral intention to use. Lee (2006) examined the acceptance of e-learning system usage among university students. He stated that perceived usefulness and perceived ease of use are the most important factors. The positive effect of perceived usefulness on attitude and intention to use was demonstrated in the original TAM developed by Davis (1986). In light of these findings, the following hypothesis was formed:

H₄: *Perceived usefulness of e-learning systems significantly increases positive attitude towards e-learning of students.*

Davis and colleagues (1989) noted that perceived ease of use is the secondary important variable that is effective in predicting the intention to use. Studies indicate that perceived ease of use affects the intention of use both directly and indirectly (Ayeh et al., 2013). Based on these findings, the following hypothesis was formed:

H₅: *Perceived ease of use of e-learning systems significantly increases positive attitude towards e-learning of students.*

Attitude

Attitude is determined by the perceived usefulness and perceived ease of use. The correlation between intention to use and attitude can be explained as follows: If all other variables were equal, people with positive attitudes would have a greater intention to use. Chen and colleagues (2002) created a new model by combining TAM and IDT and they tried to predict the usage intention of the people who use a virtual store application via this model. In this context, the following hypothesis was formed.

> H_8: *A positive attitude towards e-learning systems significantly increases behavioral intention to use e-learning systems.*

Fear of the Coronavirus

Fear is a reaction that occurs in the presence of danger. However, when the threat is uncertain and constant, such as COVID-19 in the pandemic, fear can become chronic and challenging (Mertens et al., 2020). With the outbreak of the coronavirus (COVID-19) in China in December 2019 and in Europe in February 2020, national polls indicate sharp increases in fear and worries relating to the virus (Asmundson & Taylor, 2020; McCarthy, 2020).

The frequency of use of e-learning systems may have been affected by this atmosphere of fear. Students' feelings of fear led them to stay in their homes, which may have had a positive impact on the acceptance of system use. From this point of view, the hypotheses below have been created:

> H_6: *Fear of the coronavirus significantly increases positive attitude towards e-learning systems.*
> H_9: *Fear of the coronavirus significantly increases behavioral intention to use e-learning systems.*
> H_{12}: *Fear of the coronavirus significantly increases continuance intention to use e-learning systems.*

Self-learning necessity

Learning is inherently an individual activity, although it is conducted in systematic and regulated social fields. Humankind needs information to survive and maintain individual and societal developments. Therefore, individual effort, desire and direction are important for effective learning. Indeed, Illeris (2003) drew a theoretical framework by emphasizing the interaction of three dimensions of learning. Those are individual cognition, individual emotion and environment. Individual cognition means functionality that represents the reasoning ability of the individual. Individual emotion reflects the sensibility that reveals mental balance. Ultimately, environment represents the social integrity of individuals. The theoretical framework reveals the importance of internal motivation and the intention of the individual towards learning. Accordingly, self-directed learning theory asserts a learning

process based on conscious and deliberate learning behavior. The process involves the following stages: diagnosing learning needs and setting up pertinent learning goals, procuring relevant human and physical resources for the planned learning, executing chosen learning strategies and evaluating the self-guided learning process (Ryoo, 2011). Under the social isolation conditions created by the COVID-19 pandemic, internal intention becomes prominent and replaces the external obligations, regulation and imposition, making students aware of the necessity of self-learning. Accordingly, Ghazali et al. (2021) revealed empirically that students regard self-learning necessity as significant during COVID-19 period. First, they examined students' perceptions during COVID-19 and introduced the perception variable about the need for self-learning into the literature. One of the reasons behind the use of e-learning systems by students in the pandemic may also be out of necessity for self-learning. Accordingly, the following hypotheses have been established.

> H_7: *Self-learning necessity perception of students significantly increases positive attitude towards e-learning systems.*
>
> H_{10}: *Self-learning necessity perception of students significantly increases behavioral intention to use e-learning systems.*
>
> H_{13}: *Self-learning necessity perception of students significantly increases continuance intention to use e-learning systems.*

Behavioral intention

Intention to use is a measure of the possibility that a person will perform a behavior (Ajzen & Fishbein, 1980). Behavioral intention to use includes motivational factors that will affect behavior (Ajzen, 1991). The correlation between intention to use and continued intention to use has been demonstrated by many studies. In addition, in the original TAM, the main determinant of actual use is shown as the intention to use (Davis, 1989). Based on this information, the following hypothesis has been established:

> H_{11}: *Behavioral intention to use e-learning significantly increases continuance intention to use e-learning systems.*

Research objective and methodology

The main purpose of this study is to develop a new understanding for adoption of e-learning by university students during the COVID-19 pandemic.

Data collection

We conducted the survey with undergraduate and graduate students at a foundation[1] university located in Istanbul province. The questionnaire submitted to the students on the web was filled out online. Over a period of approximately two months, 1,075 students completed the survey. There were 59 responses filled out incorrectly, leaving 1016 responses suitable for analysis.

Instruments

The survey consists of scales of the technology acceptance model, self-learning, and fear of coronavirus. We also integrated compatibility and continuance intention dimensions to the technology acceptance model to depict the detailed usage of e-learning systems. The technology acceptance model scale consists of compatibility (COMP), perceived usefulness (PU), perceived ease of use (PEU), attitude (ATT), behavioral intention (INTEN), continuance intention (CONIN) dimensions and 30 items. The self-learning necessity during school closure due to COVID-19 (SELF; Trung et al; 2020) scale consists of five items and one dimension. The fear of the coronavirus (FEAR; Mertens et al., 2020) scale consists of eight items and one dimension. We operated the scale based on the e-learning activities and adopted scales developed or adapted by Venkatesh and Davis (2000), Park (2009), and Cheung and Vogel (2013). We integrated the compatibility instrument developed by Moore and Benbasat (1991), and continuance intention scale adapted by Roca and colleagues (2006). All scales used a 5-point Likert scale and scale poles ranging from "strongly disagree" to "strongly agree."

Data analysis

First, we entered data into SPSS 22.0 and then performed the data splitting process to implement reliability and validity analyses. Indeed, the simplest way to look at reliability is to use split-half reliability for assessing scale reliability. This method randomly splits the dataset into two. A score for each participant is then calculated based on each half of the scale (Field, 2005; Khan & Adil, 2013). Lorenzo-Seva (2022) stated that if the same sample is analyzed using two different methodological approaches the outcomes lead to different conclusions. We randomly split the data into two subsamples. We captured the first 300 data to perform reliability and exploratory analyses. Then, we performed the confirmative factor analysis, correlation analyses and path analysis on the remaining data, consisting of 716 respondents. We used SmartPLS software to perform reliability, exploratory factor, and

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[1] The universities in Turkey are divided as state and foundation universities. The foundation universities, which differ from private universities. provide paid education and are governed by a board of trustees.

discriminant validity analyses, and AMOS software for computing a confirmatory factor analysis and testing the hypotheses through structural equation modeling.

Results

Participants

The profile of participants is shown in Table 1. Eighty-seven percent of students are between the ages of 19-22 and 78.4% of the students are continuing their bachelor's degree education. 6.2% are first year students, 46.6% are second year students, 22.6% are third year students and 22.1% are fourth year students.

Table 1 Profile of respondents

Demographic Information	Age	Number	Percent		Level	Number	Percent
	18	11	1.5		Associate's	143	20.0
	19	117	16.3	Education Level	Bachelor's	561	78.4
	20	191	26.7		Postgraduate	12	1.7
	21	154	21.5		Total	716	100.0
	22	125	17.5		Grade	Number	Percent
Age of Students	23	60	8.4		First	45	6.3
	24	25	3.5		Second	334	46.6
	25	11	1.5		Third	162	22.6
	26 and more	22	3.1	Grade	Fourth	158	22.1
	Total	716	100.0		4+	17	2.4
					Total	716	100.0
	Level of User	Number	Percent		Percent	Number	Percent
	Learner	98	13.7		Only Smartphone	66	9.2
Computer Skill	Intermediate	456	63.7		Only PC/Laptop	377	52.7
	Advanced	162	22.6		Only Tablet	7	1.0
	Total	716	100.0		PC/Laptop Smartphone	178	24.9
	Employee	Number	Percent	E-Learning Devices Used	PC/Laptop Tablet	13	1.8
Gender	Female	485	67.7		PC/Laptop Tablet Smartphone	69	9.6
	Male	231	32.3		Tablet Smartphone	6	.8
	Total	716	100.0		Total	716	100.0

Intermediate level computer skills were reported by 63.7% of respondents, with 22.6% reporting advanced level computer skills and only 13.7% of the respondents reporting learner level computer skills. More than half of the students use only PCs/Laptops to access online courses. 24.9% of students use both PC/Laptop and smartphones while 9.2% use only smartphones.

Research tools

Initially, we used SmartPLS software for indicator reliability analysis. Three items of the fear of coronavirus scale had to be removed because they did not meet the indicator reliability. Hair and colleagues (2017: 113-114) suggested that outer loading should be above . 708 and those between . 40 and . 70 should be considered for removal from the scale only when deleting the indicator leads to an increase in the composite reliability. We tested the items of fear of coronavirus scale and noticed which three items led to an increase in the composite reliability, leading to their removal. The minimum outer loading of items is . 559 (fear of coronavirus scale) and it is above the recommended limit (. 40) by Hair and colleagues (2017). Finally, the items met the requirements of indicator validity.

Then, we analyzed the internal consistency, composite validity, AVE and discriminant validity by using SmartPLS software shown in Table 2. The minimum Cronbach's alpha coefficient of variables is .749 (fear of coronavirus scale), therefore, above the recommended limit (. 70) for reliability. Similarly, the minimum composite reliability coefficient is .833 (fear of coronavirus scale) and, therefore, above the recommended limit (. 70) for sufficiency. The convergent validity was computed through the average variance extracted (AVE) by using SmartPLS software. The AVE values of factors are above . 50 and they are satisfactory. We viewed the discriminant validity of variables and the AVE values meet the Fornell-Larcker criterion. The AVE values are greater than its highest correlation with any other construct, and construct shares more variance with its associated indicators than with any other construct (Hair et al., 2017: 116).

Finally, we performed confirmative factor analysis to test the construct validity of scales. As can be seen in Table 3, the technology acceptance model scale shows an acceptable level of fit. The AGFI value appears to be questionable, but Byrne (2001) state that adjusted goodness-of-fit index (AGFI) $\geq$ .80 is acceptable (Byrne, 2001; Reis et al, 2010: 109). Goodness-of-fit indices indicate that self-learning and pandemic fear scales demonstrate strong fit.

Table 2 Reliability and convergent validity of variables

Factor	Items	Cronbach's Alpha	rho_A	Composite Reliability (C.R.)	Average Variance Extracted (AVE)
COMP	3	.911	.919	.945	.851
PU	9	.982	.982	.984	.872
PEU	6	.936	.941	.950	.761
ATT	6	.985	.985	.988	.930
INTEN	3	.959	.960	.974	.925
FEAR	5	.749	.778	.833	.503
SELF	5	.935	.947	.950	.793
CONIN	3	.982	.982	.988	.965

Table 3 Goodness-of-fit statistics of confirmative factor analysis

Scale	X^2	X^2/df	GFI	AGFI	NFI	TLI	IFI	CFI	RMSEA	RMR
Technology Acceptance Model	1723.20	4.535	.850	.817	.957	.962	.966	.966	.070	.080
Self-Learning		.070	.064	1.000	.999	1.000	1.000	1.000	1.000	.000	.001
Pandemic Fear	3.486	1.162	.998	.990	.994	.997	.999	.999	.015	.009
Good Fit		≤ 3	$\geq .90$	$\geq .90$	$\geq .95$	$\geq .95$	$\geq .95$	$\geq .97$	$\leq .05$	$\leq .05$
Acceptable Fit		≤ 5	$\geq .85$	$\geq .85$	$\geq .90$	$\geq .90$	$\geq .90$	$\geq .95$	$\leq .08$	$\leq .08$

Adapted from Meydan & "Structural equation modeling: Applications of AMOS" by C. H. Meydan and H. Şeşen, 2015, Detay Publication.

The descriptive statistics and the correlation coefficients are shown below in Table 4. Means of variables are between 2.57 and 4.07 and the standard deviations are between .68 and 1.54, which means that averages of variables are close to central value. The analysis reveals that correlations are significant ($p < .001$) between dependent carriable (continuance intention) and other independent variables. Skewness and kurtosis were analyzed to determine how the measurements meet normality assumption. Brown stated that values of skewness are acceptable between ±3, and kurtosis between ±10 to implement Structural Equation Modeling (SEM) (Brown, 2006; Griffin & Steinbrecher, 2013).

Table 4 Means, Standard Deviations and Correlation

Factor	1	2	3	4	5	6	7	8	9	10	11	12	M	SD
1. Age	1												21.151	2.331
2. Gender	.071	1											1.323	.4678
3. Education Level	.127***	.107**	1										1.817	.4281
4. Computer Skill	.143***	.217***	.163***	1									2.089	.5964
5. COMP	.150***	.083*	.009	.302***	1								2.8003	1.381
6. PU	.155***	.116**	-.023	.275***	.935***	1							2.5695	1.440
7. PEU	.079*	.112**	.039	.370***	.753***	.718***	1						3.5743	1.116
8. ATT	.149***	.111**	-.015	.264***	.928***	.959***	.720***	1					2.7158	1.496
9. INTEN	.143***	.084*	-.040	.254***	.905***	.918***	.709***	.943***	1				2.8184	1.542
10. FEAR	.058	.063	.036	.204***	.455***	.460***	.425***	.443***	.432***	1			4.0684	.6777
11. SELF	.143***	.065	-.032	.276***	.841***	.859***	.690***	.873***	.880***	.423***	1		2.8480	1.317
12. CONIN	.171***	.102**	-.047	.266***	.890***	.926***	.699***	.935***	.928***	.421***	.855***	1	2.6769	1.506

***$p < .001$, **$p < .01$, *$p < .05$

The descriptive statistics, indicator validity, internal consistency, composite validity, AVE, discriminant validity, and confirmative factor analyses indicate that measurements are good and hypothesis testing can be implemented.

Hypothesis testing

The goodness-of-fit statistics given in Table 5 for hypothesis testing model are acceptable. Only the GFI and AGFI values are slightly low; however, .80 and greater values are acceptable for both indices in the literature (Brown & Cudeck, 1993; Byrne, 2001; Hu & Bentler, 1999; Reis et al., 2010).

We established the path diagram given in Figure 2 below. The model presents squared multiple correlation coefficients .953 for perceived usefulness, .579 for perceived ease of use, .962 for attitude, .968 for behavioral intention and .927 for continuance intention. These R^2 values are enough to construe the hypothesis testing model.

Table 5 Goodness-of-fit statistics of path analysis

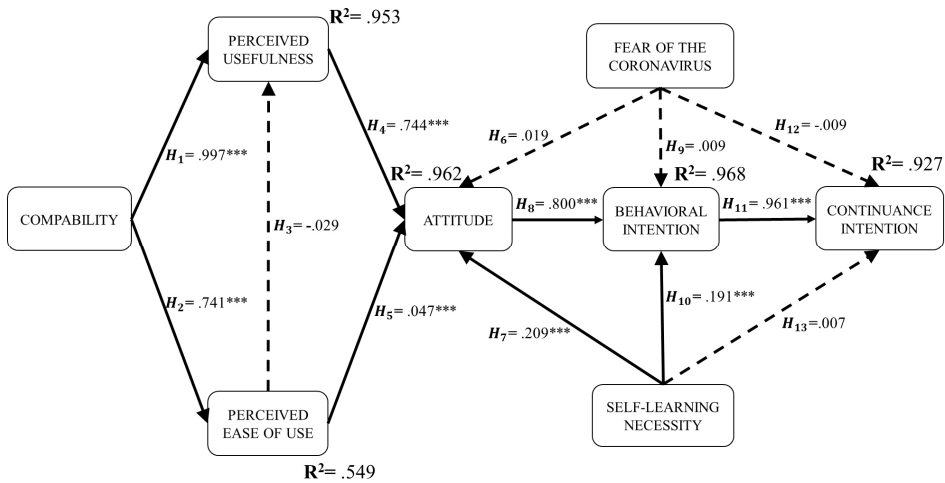| Model	X^2	X^2/df	GFI	AGFI	NFI	TLI	IFI	CFI	RMSEA	RMR
Hypothesis Testing Model	2686.461	3.773	.831	.806	.943	.954	.958	.958	.062	.079
Good Fit		≤ 3	$\geq .90$	$\geq .90$	$\geq .95$	$\geq .95$	$\geq .95$	$\geq .97$	$\leq .05$	$\leq .05$
Acceptable Fit		≤ 5	$\geq .85$	$\geq .85$	$\geq .90$	$\geq .90$	$\geq .90$	$\geq .95$	$\leq .08$	$\leq .08$

Adapted from Meydan & Şeşen, (2015).

Figure 2 Path analysis

The results indicate that the coefficient is positive and significant, consistent with the hypothesis (β = .997, p < .001), thus H_1 is accepted. This finding means that compatibility of an e-learning system significantly increases perceived usefulness of the system. Compatibility of an e-learning system significantly increases perceived ease of system usage (β = .741, p < .001), so H_2 is accepted. However, as the effect of perceived ease of e-learning system use on the perceived usefulness of system is not significant (β = -.029, p > .05), H_3 is rejected. Perceived usefulness, ease of use of e-learning system, and self-learning necessity perception significantly and positively affect a positive attitude toward e-learning systems (β = .744, p < .001; β = .047, p < .001; β = .209, p < .001) supporting H_4, H_5 and H_7. The effect of coronavirus fear on a positive attitude toward e-learning system is not significant (β = .019, p > .05), thus H_6 is rejected. Testing the effects of positive attitude toward the e-learning system, self-learning necessity perception, and fear of coronavirus on the behavioral intention to use an e-learning system revealed that the first two variables have a significant and positive effect on behavioral intention to use an e-learning system (β = .800, p < .001; β = .191, p < .001) but fear of coronavirus does not have a significant effect (β = .009, p > .05). Finally, only behavioral intention to use an e-learning systems significantly and positively affects the continued intention to use the system (β = .961, p < .001), while self-learning necessity perception and fear of coronavirus do not affect it significantly (β = .007, p > .05; β = -.009, p > .05).

Table 6 Hypothesis testing

Model	Path Specified				Hypotheses	Coefficient	Result
	Independent Variable	Path	Dependent Variable	R2		Std. Estimates	
Path Analysis	Compatibility	→	Perceived Usefulness	.953	H_1	.997***	Accepted
	Compatibility	→	Perceived Ease of Use	.549	H_2	.741***	Accepted
	Perceived Ease of Use	→	Perceived Usefulness	.953	H_3	-.029	Rejected
	Perceived Usefulness	→	Attitude		H_4	.744***	Accepted
	Perceived Ease of Use	→	Attitude	.962	H_5	.047***	Accepted
	Fear of the Coronavirus	→	Attitude		H_6	.019	Rejected
	Self-Learning Necessity	→	Attitude		H_7	.209***	Accepted
	Attitude	→	Behavioral Intention		H_8	.800***	Accepted
	Fear of the Coronavirus	→	Behavioral Intention	.968	H_9	.009	Rejected
	Self-Learning Necessity	→	Behavioral Intention		H_{10}	.191***	Accepted
	Behavioral Intention	→	Continuance Intention		H_{11}	.961***	Accepted
	Fear of the Coronavirus	→	Continuance Intention	.927	H_{12}	-.009	Rejected
	Self-Learning Necessity	→	Continuance Intention		H_{13}	.007	Rejected

***$p < .001$, **$p < .01$, *$p < .05$

Discussion

Our findings demonstrate that compatibility, perceived usefulness, perceived ease of use, attitude, and self-learning necessity significantly affect the intention to use e-learning systems. According to the findings, 96.8% of the intention to use e-learning systems can be explained by the developed model. This ratio is higher than findings with integrated models in the literature (Tung & Chang, 2008b; Venkatesh et al., 2003). For example, Wu and colleagues (2007), in their study on 121 doctors and health workers, showed that the variables of compatibility, perceived usefulness, and perceived ease of use can explain the intent of using mobile health systems by 70%. The compatibility determinant explained 95.3% of perceived usefulness and 54.9% of perceived ease of use. A very high proportion of perceived usefulness can be explained by compatibility. This result can be identified as follows: Students may have first thought that e-learning systems were compatible with their working style and way of working, which may have led them to develop a positive expectation that using the system will improve their performance. This development of positive perception may have created a positive attitude, which may have strongly influenced their intention to use the e-learning system.

The positive effect of compatibility on perceived usefulness has also been shown in many studies (Chen et al., 2002; Chen et al., 2004; Tung & Chang, 2008b). Compatibility also has a positive effect on perceived ease of use. Compliance with working style reduces the effort that a person will make when working, which can make it easier to use the system.

Research findings indicate that compatibility affects perceived usefulness more than perceived ease of use. Compatibility also has an indirect effect on the intent to use. This effect of compatibility on intent to use has also been confirmed by some studies (Chang & Tung, 2008; Hernandez & Mazzon, 2007). According to our results, a large part of the attitude variable is explained by the perceived usefulness variable. Nevertheless, perceived ease of use appears not to have strong effects on attitude. These results are consistent with the original version of TAM. Studies have shown that perceived usefulness is a more important variable in predicting intent to use than perceived ease of use (Wu & Wang, 2005). Perceived usefulness examines the external properties of information systems, such as efficiency and effectiveness (Wixom & Todd, 2005), perceived ease of use examines the intrinsic properties of information systems, such as flexibility and openness (Gangwar et al., 2015).

Based on this, we can make the following inference: it can show that students are concerned about external characteristics of e-learning systems more than their internal characteristics. Indeed, Fusilier and Durlabhji (2005) found that the experience of using the internet had a strong effect in their study. They noted that if users have experience using Internet, perceived usefulness would have a stronger effect than perceived ease of use. This shows that as experience increases, the perception of usefulness increases and the perception of ease-of-use decreases. Within the scope of this research, 63.7% of the students who participated in the survey are intermediate level computer users. The reason that the perception of ease of use does not have a strong effect may be due to the students already having experience using computers. Students may have found using e-learning systems clear and understandable. They may not have had to spend a lot of time learning to use the system in the first place. Given the profiles of the students responding to the survey, it is understandable that they found it easy to use the e-learning system. This explains why ease of use has a weak effect on intention to use.

According to the findings, no significant correlation was found between perceived ease of use and perceived usefulness. This result is not consistent with the original version of TAM. Despite this fact, some studies have obtained similar results. For example, Chen and colleagues (2004) showed that perceived ease of use had no significant effect on perceived usefulness. Wu and colleagues (2007) noted in a study that examined the acceptance of use of mobile health systems that perceived ease of use did not affect perceived usefulness. The relationship between perceived ease of use and perceived usefulness can be explained as follows: for systems where everything is equal, the easier system is the more useful one (Venkatesh & Davis, 2000). This finding can be explained by the fact that students are already able to use the e-learning system easily, and this situation does not affect the perception of usefulness of the system. The fact that the students who use the system are experienced and do not make extra effort to use the system may also have prevented a positive perception of usefulness.

Fear is an adaptive emotion that serves to mobilize energy to deal with potential threat. However, when the threat is uncertain and constant (COVID-19), as in a pandemic, fear can become chronic and challenging (Mertens et al., 2020). In this context, it was believed that fear could have a positive effect on the use of the e-learning system. But according to our results, fear factor did not have a positive effect on students' use of the e-learning system. It has been observed that fear does not affect the attitude of students, nor does it affect the intention to use an e-learning system, and therefore the continuance intention remains unaffected as well.

Findings show that self-learning necessity has a weak effect on attitude and behavioral intention. Trung and colleagues (2020) (COVID-19) in their study of middle school students during the pandemic, developed the self-learning necessity factor. Self-learning necessity was defined by the sub-clauses of ensuring learning progress, maintaining learning habits, and being influenced by teachers, parents, and friends. It is credible that the self-learning necessity factor has a strong impact on primary and secondary school students. It is also credible that the same effect does not appear on university students. Just as university students may be less influenced by their environment, their habits are made up of individuals who are relatively mature and aware of the need to ensure learning progress. For this reason, self-learning necessity might have had a negligible effect on e-learning system usage attitude and behavior intention to use. Continuance intention is directly affected by behavioral intent to use. The percentage of continuity intention description was 92 percent, meaning that people act in accordance with their intentions.

Theoretical implications

TAM is one of the most widely used models for explaining the acceptance of information systems. Although TAM is a very useful theoretical model for explaining and understanding user behavior of information systems, it is recommended that the model is expanded by integrating new variables to include human and social factors. Therefore, in this study, an integrated model was designed by combining TAM with the compatibility variable in IDT. Since it represents social factors, fear of COVID-19 and self-learning necessity were integrated into the model, thus new correlations that were not defined in the literature have been indicated. We found that compatibility is the most important factor affecting the use of e-learning systems. Therefore, while encouraging and promoting the use of the e-learning system, underlining the compatibility of students' work styles, work patterns, and experiences can create effective results.

Perceived usefulness is measured by the degree of contribution the system makes to user performance. Being able to do tasks in a shorter time or to obtain high-quality outputs can be examples of this situation. Students' higher perception of usefulness might stem from positive impact of e-learning systems on their academic performance. Although perceived ease of use also influences attitude, this effect was not as high as the effect of perceived

usefulness on attitude. Thus, e-learning systems designers can create a higher acceptance of system use by focusing on improving performance and productivity of students rather than simplifying the system.

Intention to use is defined as "a measure of a person's possibility of performing a behavior." Intention to use includes motivational determinants that will influence behavior. These determinants are a measure of how much effort people plan to put in to perform a certain behavior. Indeed, intention is the primary condition to use a system. If individuals really intend to conduct a behavior, they will make more effort to carry it out. Consequently, intention increases the probability and continuity of the behavior occurring. According to our findings, although fear does not cause any change in intention or attitude, it seems that self-learning necessity has a positive effect on attitude and the intention to use the e-learning system.

Students' self-learning habits are not the same during school and vacation times. While the decline in students' self-learning habits during vacation time is seasonal and predictable, irregularities in their learning habits during a sudden outbreak such as a pandemic are still not clear and are being investigated. Based on these findings, it can be deduced that university students are influenced by their environment and teachers, and slightly less regarding the use of the e-learning system.

Practical implications

The results of this study may give an idea to e-learning system practitioners and system designers about on what they should focus. Initially, system developers have to focus on compliance of e-learning systems with individual habits, capabilities, relevance for better usefulness and ease-of-use perception on the system. They need to pay attention to system design regarding inherent sources of motivation. Managers or system developers may even emphasize the coherent features of the system to arouse the interest of individuals.

Second level practical implications are related to sources of attitude. Findings validate the importance of cognition to shape individuals' attitudes. So, a practitioner should give due consideration to the usefulness and friendliness perception of individuals on e-learning systems. Evoking the self-learning necessity of students is an alternative strategy to shape attitude. Indeed, self-learning necessity and attitude have importance on occurrence of behavioral intention. Behavioral intention is a concrete indicator for the connection between students and e-learning systems. Therefore, practitioners should consider strategies for shaping attitude and evoking self-learning necessity by students. Eventually, behavioral intention is a core reason for continuance intention. If the students perceive that e-learning systems can contribute to their learning activities and their attitudinal gain in terms of usefulness, friendliness and compatibility of the system, they will continue to use it.

Conclusion

There are a few studies examining the acceptance of the use of e-learning systems that are rapidly becoming widespread during the pandemic. It is important to understand exactly why students use e-learning systems in this process and to be able to predict the factors affecting acceptance of use. The motivation for conducting this research was to identify the factors that influence the acceptance of e-learning systems among students.

As a result, if one's purpose is to increase the acceptance of the use of e-learning systems used during the pandemic, first of all, it will be much more valuable to focus on the suitability of the system (working conditions, working style, etc.), and then the determinants that will increase the performance of the system (increasing efficiency, gaining speed, getting better output, etc.) than making the system easier to use or the effects of the environment (recommendations, pressures, etc.).

Limitations

Not all the variables identified in the model developed within the scope of the research could be supported. By eliminating some variables from the developed model and adding different ones, new effects that may occur on the intention to use and actual use can be examined. These variables may be self-confidence about computer use and subjective norms —the effect of teachers and peers on the use of e–learning.

The dataset was collected from a single university. Although there was large participation in this study, there is no country or city-based heterogeneous sample. Therefore, the results have limitations on showing the e-learning habits of all university students. Other limitations of the study are sample size and characteristics, data collection method, measurement instruments, statistical analysis techniques and software.

Suggestions for future research

This research expands the existing knowledge about the acceptance of the use of e-learning systems. The results of the research may be useful for researchers who want to compare students' behavior in a normal situation with an unusual situation such as a pandemic. Research findings may be useful for researchers who want to compare the learning habits of students in Turkey.

In future studies, whether e-learning system differences such as mandatory or voluntary system use are effective can be examined by using a larger sample. Due to the widespread use of e-learning systems, the factors affecting the acceptance of system use in different levels of schools such as primary and secondary schools can be investigated more comprehensively in the future. Also, case studies might result in different implications.

Researchers can design new models that will expand the aforementioned constraints and present new findings to the literature. This research has aimed to contribute to the theory by integrating new extensions to the two dimensions (perceived usefulness and perceived ease of use) that form the basis of TAM. Studies of this kind may lead to increase in user acceptance and effective use of new e-learning systems, and may contribute to the emergence of systems that students will use more efficiently. As a result, these findings may inspire future research as well as guide the design of new e-learning systems.

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Academic inbreeding as a hiring policy: Capturing the voices of academics from Turkey

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Abstract

This paper explores the phenomenon of academic inbreeding in Turkey's higher education through the experiences of academics. Using purposive sampling, 16 academics were interviewed through semi-structured questions, and descriptive and content analysis were employed. Results suggest that there are some commonalities yet some differences in the perspectives of academics. There exists a good agreement on the idea that the limitation of inbreeding practice would be legitimate, yet, inbred academics consider inbreeding as useful and reasonable whereas non-inbred describe it inevitable and problematic. Participants identified the main motives of inbreeding in Turkish academia as provincialism, academic nepotism, eastern culture, and institutional culture and traditions. Each theme is discussed based on both narratives and related literature, and implications are presented.

Keywords: academic inbreeding, inbred academics, non-inbred academics, immobility, higher education.

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Introduction

Higher education (HE) systems are increasingly diversifying all over the world (Song, 2019). In this process, professors are expected to adopt dynamic and participatory approaches to produce and disseminate information (Horta et al., 2010). While studying the correlates of scholarly productivity, researchers have focused on the concept of academic inbreeding (e.g. Horta, 2013), which refers to a recruiting process by which universities immediately employ their graduates as academics after graduation (Horta et al., 2010; Lee et al., 2014). Eliot (1908), who served the longest as the president of Harvard University assessed inbreeding as "… natural, but not wise, for a college or university to recruit its faculties chiefly from its graduates" and warned universities against the grave dangers of this practice. Since then, researchers (e.g. Eisenberg & Wells, 2000; Wyer & Conrad, 1984) have paid attention to this phenomenon, investigating its impact on higher education institutions (HEIs), often referring its dark side with several metaphors such as academic incest and endogamy.

The academic inbreeding literature can be classified under two themes: scientific production and institutional dynamics (Gokturk & Yildirim-Tasti, 2020). For the first theme, because of its notorious image, hiring new and competent academics is often seen as a welcome change, as it offers an ideal opportunity to provide new blood to the HE system. However, when the stay of willing and talented inbreds becomes questionable, it is a serious challenge (Pan, 1993). Yet, academic inbreeding has some benefits to the alma mater institution, such as increasing organizational maintenance and coherence, declaring confidence in the quality of the department's program, and hiring the academics in a quicker and cheaper way. Since prior studies mostly concentrated on productivity aspect of the inbreeding phenomenon via quantitative methods, organizational aspects of academic inbreeding remain neglected.

There exist diverse practices and motives behind inbred appointments throughout the world (Yudkevich et al., 2015). For instance, the USA is the top choice for higher level education around the world and it has rather low levels of inbreeding in HEIs. Likewise, the UK is the second leading destination for those intended to pursue tertiary education abroad, with a consistently small number of inbred academics (Sivak & Yudkevich, 2012). However, Argentina, China, Japan, Russia, Slovenia, South Africa, Ukraine, Spain, Portugal, and Mexico appear to apply and rely selectively on academic inbreeding in hiring academics broadly (Horta 2008; Horta et al., 2011; Yudkevich et al., 2015). Therefore, discussions are navigated by and focused on the uncompetitive nature of inbreeding, and the incessant impact on universities (Gorelova & Yudkevich, 2015). For some practical and strategic reasons, many of the HEIs in Turkey prefer employing their graduates as academics as well. Along with the recent debates on quality improvement in Turkey's HE, the issue of academic inbreeding has emerged as a phenomenon of particularly unexplored practice. In this context, this qualitative study is timely in opening up the largely understudied potential of inbreeding in Turkey from the lenses of inbred and non-inbred academics. Based on the interviews

conducted with selected academics working at dominantly inbred and non-inbred faculties, it has the potential to provide a comparative perspective and discussion based on 'two sides of the same coin.' Also, it has the potential to reveal and lead to a better understanding of the multifaceted nature and dimensions of academic inbreeding since it does not limit the research questions by being concerned only with scientific productivity.

Conceptual framework

The concept of inbreeding refers to the production of genetically closely related individuals or organisms, and thus the reproduction of similar or common traits in biology (Chinyere & Harrison, 2016). This concept is used to imply a similar production process of academic culture in HE, with the term academic inbreeding, which is also called institutional or intellectual inbreeding (Horta et al., 2010), implying its pathological effects on scholarly output. Horta (2013) suggests five possible categories of academic career taxonomy, as follows:

(1) Pure-inbreds: Inbreds that have always spent their learning and academic career in the same university.

(2) Mobile-inbreds: Inbreds that have either spent some time researching or teaching at another university during their doctoral or postdoctoral work before being employed at their alma mater.

(3) Silver-cordeds: Academics who received their PhD degree at the same university, but started their academic career in another university.

(4) Adherents: Academics who moved only once in their academic careers from the university that granted their PhD to the university that granted them their first academic appointment.

(5) Non-inbreds: Academics who had no previous connection with the university at which they currently work.

As Horta's (2013) taxonomy is often cited in the recent HE conceptualizations and applicable to academic career taxonomy of academics in the Turkish HE system, our study favours it to treat and better understand the phenomenon of academic inbreeding.

Since inbreeding has become a concern in HE systems, it is viewed as a manifestation of particularism and parochialism, and inbred academics are considered to be less exposed to new ideas and techniques, which leads to a lower level of scientific productivity and creativity (Hargens & Farr, 1973). Hargens and Farr (1973) found that U.S. inbred academics from the different fields at the most eminent universities are less productive than their non-inbred colleagues. Inbred academics in Mexico were found to be 15% less productive in terms of scientific publications in the fields of natural sciences, engineering, and technology (Horta et al., 2010). Morichika and Shibayama (2015) displayed that the effects of inbreeding on academic productivity differ by university, department or laboratory, and whether

academics are pure-inbred or silver-corded in different departments of Japanese universities. This study also revealed that inbred academics have changed their research topics less frequently throughout their careers, which could be detrimental to creativity.

Some researchers (e.g. Dutton, 1980; Horta, 2013) explored the relationship of mobility with scientific productivity. For example, Dutton (1980) proved that immobility is a more remarkable indicator of research interest, and Horta (2013) showed that academic mobility in the early stages of the career was decisive in influencing academic behavior and scientific productivity. Another study found that inbred academics are cited less frequently (Eisenberg & Wells, 2000). İnanç and Tuncer (2011) demonstrating that academics' productivity is negatively affected in the departments where academic inbreeding rates are high in four technical universities in Turkey.

Academic inbreeding is not always considered to be a dangerous breakdown of institutional metabolism, and may be useful at least in some cases. Gorelova and Lovakov (2016) empirically displayed that academic inbreeding does not have a significant effect on publication activity among Russian academics. Further, they reported that pure-inbreds are more productive in publishing than the adherents. A study with U.S. academics concluded that scholarly productivity of inbred and non-inbred academics did not show any significant difference (Wyer & Conrad, 1984). Horta et al. (2010) also reported that inbreeding has a function of protecting organizational stability and institutional identity in Japanese universities. Other researchers reported several benefits of inbreeding on corporate culture and organizational commitment from different country contexts such as China, Russia and Portuguese (Tavares et al., 2021). More recently, Shibayama (2022) evidenced that inbreeding can be a double-edged sword depending on the PhD supervisors' orientation towards originality, since this characteristic is likely transferred to their mentees. More specifically, academics' orientation to produce original knowledge is found to be more dependent on the supervisor's practices than inbreeding (Shibayama, 2022). Tyurikov et al (2021) produced a model of academic inbreeding that minimizes the potential drawbacks of this practice while protecting talented home-grown academics. Their model is mainly based on preserving the talented in an institution's own graduates by providing rich research facilities and enhancing student motivation.

As recent research findings display, the consensus tends to the negative sides of academic inbreeding, focused on its effect on scholarly productivity. This perspective is challenged by some benefits such as organizational commitment, teaching, and service to society (Wyer & Conrad, 1984). Some authors favor inbreeding on the grounds that employing a university's own graduates continues the academic traditions special to a specific academic culture (Chinyere & Harrison, 2016), for example, securing organizational and individual stability through the reproduction of institutional tradition by empowering senior academics (Gokturk & Yildirim-Tasti, 2020).

Based on these grounds, this paper aims to investigate the phenomenon of academic inbreeding through the perspectives and experiences of participants from a largely inbred and a largely non-inbred academics from Turkey through these research questions:

(1) What selection criteria are applied in the selection and promotion of academics?

(2) How do academics evaluate academic inbreeding as a hiring policy?

(3) What are the reasons for preferring inbred academics in hiring processes?

(4) How do academics evaluate formal policies that restrict inbreeding?

Academic inbreeding in Turkey

Academic inbreeding is common in Turkey, especially in state universities. The practice is less common in the developing universities (as the group of relatively newly established institutions are called in Turkey), and non-profit foundation universities. The main reason for this exception is that they have no doctoral programs and thus the university employs research assistants from other universities as their prospective assistant professors after graduate education.

In Turkey, there is a highly-centralized public administration structure. The procedures and principles of the appointment and promotion of academic staff in HEIs are explained in the Higher Education Law, which has no statement restricting or encouraging inbreeding in HEIs. However, it is stated that "HEIs can determine additional conditions in an objective and auditable quality by obtaining the approval of the Council of Higher Education (CoHE), taking into account the differences between scientific disciplines, exclusively to increase scientific quality" (Higher Education Law, article 23/c; p. 5361). The CoHE is the highest authority regulating academic, institutional and administrative processes in higher education authorized by the Turkish Constitution with articles 130 and 131. All higher education institutions in Turkey have been gathered under the umbrella of the CoHE. It is mainly responsible for the strategic planning of higher education, the coordination between universities, and most importantly establishing and maintaining quality assurance mechanisms (YÖK – *History in English,* n.d.).

The hiring process for academic positions seems transparent in terms of the Higher Education Law and universities' administration processes, since job advertisements state that positions are open to anybody. Nevertheless, in practice, there is a strong tendency even for most of the long-established Turkish universities to hire their graduates. They can specify special conditions referring to the Higher Education Law, suggesting they will favor the academic work of the inbred academics. This practice is known as *promoting from inside* despite formally being open to applications from outside the university. On the other hand, in 2017, the head of CoHE at that time declared for the first time that the inbreeding of academics is a problem for higher education institutions at the national level and that an action should be taken in terms of hiring policy as follows (https://www.hitit.edu.tr):

> "Although a research assistantship is the most important stage of the academic career process, in the current situation, a significant portion of research assistants continue their entire careers in the institution where they are research assistants. This situation, which means inbreeding, adversely affects the performance of both the individual and the institution… A performance-oriented approach will be adopted."

This declaration is regulated in "The Law-Making Amendments to Some Laws and Statutory Decisions for Development of Industry and Support of Production" (2017). The same law restricts the appointments of research assistants at the university where doctoral degree is granted as follows (article 38):

> "Assignments to research assistant positions in higher education institutions… up to 20% of those who have completed their doctorate or proficiency in arts education can be appointed to assistant professor positions within the framework of performance-based criteria determined by the senates of the institutions where they completed their doctorate or proficiency in arts education and approved by the Higher Education Council."

However, inbreeding in Turkish academia has been the dynamo of academic appointments and promotions historically, and it does not have a long-standing notoriously negative image as in the US and western higher education. Therefore, in terms of hiring policies, it has not been on the agenda as an issue to be regulated by CoHE and/or the universities. Besides, it is relatively newly seen as problematic and to be the subject of research for the Turkish higher education.

Despite the increasing attention to the topic of inbreeding in Turkish academia, the current very limited number of studies are mostly designed as literature reviews (e.g. Basak, 2013; Kozikoğlu, 2016) or quantitative studies (e.g. İnanç & Tuncer, 2011) to investigate its relationship with academic productivity. Rare studies (Gokturk & Yildirim-Tasti, 2020) were designed qualitatively to allow in-depth and thick descriptions related to the inbreeding phenomenon in Turkish academia, thereby neglecting examination of its multiple aspects. Based on a comprehensive literature review, Balyer and Ömür (2018) summarized the factors that lead universities to inbreeding: a) The most qualified researchers are their own and those who can best adapt to their own culture are their own graduates, b) University bureaucracies avoid risk by employing their own graduates as a mechanism to maintain their current order, c) Universities' desire to maintain their academic prestige by preserving their institutional culture, d) Employing their own graduates is a practical option in terms of time, energy and finance, in the face of the geographical features of the universities or the obstacles created by the dominant mother tongue, e) The lack of a free labor market in the academic labor markets, especially in developing countries, coupled with the fact that the faculty members are civil servants, the number of doctoral graduates is quite limited, a lack of mobility in society and business life, a weak belief in faculty selection systems, and the influences of the country's national language policy. This detailed summary indicates

that academic inbreeding is a multifaceted phenomenon that goes beyond research productivity and it seems to be a subject that deserves in-depth analysis touching upon other aspects of higher education. Understanding these inextricably linked factors in the context of academic inbreeding may be possible through understanding the whole rather than parts of the whole in a qualitative design, as Forchuk and Roberts (1993) suggested.

As the analytical framework to guide this study, we adopted theory triangulation in formulating the research questions, as suggested by Denzin's (1989) systematology, in which the starting point is "approaching data with multiple perspectives and hypotheses in mind" (p.239-240). According to him, different theoretical perspectives could be used together to allow wider knowledge production. As demonstrated thus far, the dynamics and a range of consequences of inbreeding literature portrayed conflicting evidence, resulting in criticism or support of the maintenance of this career recruitment practice as a hiring policy in HE systems. To this end, we followed three frameworks: 1) Horta's (2013) taxonomy in defining the cases and participants as inbred or non-inbred, 2) Horta's (2013) conceptual framework that scientific productivity is influenced by the mobility of academics, and thus, policies are needed to limit inbreeding, 3) Wyer and Conrad's (1984) note that scholarly productivity of inbred and non-inbred U.S. academics was not significantly different. Considering all these possibilities, we employed a qualitative case study to understand the perspectives embedded in their institutional and cultural contexts as being inbred and non-inbred habitants.

Methodology

This study was designed as a holistic case study, based on the investigation of the inbreeding phenomenon in two bounded contexts. A case study is "a research approach that is used to generate an in-depth, multi-faceted understanding of a complex issue in its real-life context" (Crowe et al., 2011, p. 1). Yin (2003) states that case study is used to investigate the holistic and meaningful features of real-life events, such as academics' life cycles, organizational and administrative processes, and when the case is sensitive to contextual circumstances. Here, the phenomenon of academic inbreeding was examined in-depth, focusing on two state universities, one preferring inbred academics while the other preferring non-inbreds. Case studies are particularly very appropriate for finding answers to "how and why questions about a contemporary set of events" (Meyer, 2001, p. 330). Since this research seeks answers for "How do academics evaluate academic inbreeding as a hiring policy?", "What are the reasons (why) for preferring inbred academics in hiring processes?", and "How do academics evaluate formal policies that restrict inbreeding?" from the perspectives of academics, case study is an appropriate methodology.

Cases and participants

While identifying the cases, the CVs of the academics working in four education faculties were examined through the official websites, and academics of these two faculties were determined to have the lowest and highest inbred rates. Qualitative data was collected from two public universities located in a big city in Turkey, where there were eight public universities (at the time of the study), four of which had education faculties. Among these four education faculties, the inbreeding ratios of departments of educational sciences varies between 31% and 70%. We selected the departments that had the highest and lowest ratios of inbred academics on the grounds that they may typically represent two different institutional dispositions related to the investigated phenomenon and its reflections to academia. Both of the faculties are considered among the most prestigious and well-established faculties across the country. The term "academics" is used to refer the people teach and/or do research at a university or college. It is at the same time used to refer diverse terms as faculty and faculty members in the literature. Within this research, the term "faculty" is only used to refer to the "faculty of education" as an institution. The term "department" is used to refer the sections of the faculty of education with several divisions. For example, "educational sciences" is a department while measurement and evaluation, educational administration and educational programs and instruction are the examples of divisions located under the department of educational sciences.

Case 1: Large-scale (70%) inbred recruitment. The university/ department does not have a formal policy restricting inbreeding for appointment and promotion criterion at the time of this study, but experience at a university was scored among optional activities.

Case 2: Large-scale non-inbred recruitment. This department (at the same time, university) has a formal policy in hiring academics to prevent inbreeding, especially pure-inbreeding. The university has a Criteria for Appointment and Promotion that mandates that candidates who will work as academics at this university should have received a doctorate degree from a well-known university abroad, or if they have received a doctorate degree from a domestic university, they must attend a "academic production process" at a recognized university, research or application institution abroad for at least two semesters.

A total of 16 academics, eight participants from each faculty were included in the study, at which point data saturation occurred (Guest et al., 2006). Following Horta's (2013) taxonomy, the characteristics of the participants interviewed are presented in the Table 1 below.

Table 1 Participant characteristics

Participant	Taxonomy	Gender	Age	Experience	Post-doc study (abroad)
P1-MI	Mobile-inbred	M	67	40	8 months
P2-MI	Mobile-inbred	M	55	18	2 years
P3-PI	Pure-inbred	F	37	2	No
P4-PI	Pure-inbred	F	60	30	No
P5-AD	Adherent	M	48	17	No
P6-PI	Pure-inbred	M	38	4	No
P7-NI	Non-inbred	M	41	8	No
P8-PI	Pure-inbred	F	40	9	No
P9-AD	Adherent	F	37	2	No
P10-AD	Adherent	F	40	6	No
P11-AD	Adherent	F	37	6	No
P12-AD	Adherent	M	42	7	No
P13-AD	Adherent	M	48	17	No
P14-AD	Adherent	F	50	13	No
P15-AD	Adherent	M	56	16	No
P16-AD	Adherent	M	49	20	No

The representation of each department among the participants was also considered. One academic was invited from each department from both cases. To achieve this, in some departments, more than one academic was invited and interviewed. The third criterion in the selection of the interviewees was the representation of academics of different academic titles (assistant professor, associate professor, and full professor). Finally, while academics from each department were being invited to participate, an invitation had first been sent to the department and division heads, since they are one of the jury members in the appointment process in Turkey.

Data collection

A semi-structured interview form was developed by the researchers. A pilot interview was conducted with a non-participant academic to ensure clarity and understandability of the questions. The main interview questions contained one knowledge and five opinion questions. Data were collected by the researchers through face-to-face interviews. All the participants were ensured anonymity, and confidentiality. Ethical approval for the current study was granted by the Ethics Committee (Hacettepe University, No: 35853172-600). All interviews were voice recorded and transcribed verbatim.

Data analysis

Descriptive and content analysis techniques were used to analyze the data. Since two interview questions complemented each other and overlapped, the answers to these questions were combined and analyzed under the same theme.

Rigor

There are different criteria of rigor commonly associated with the nature of qualitative approach. As Leninger stated (1990) even if it might not be possible to apply all of these standards in a given study, at least one "criterion of consistency" and "one of truth value" should be addressed. One of the validation strategies used in qualitative research is triangulation to increase the consistency of the results. Noble and Heale (2019) define triangulation as a strategy for boosting the validity and trustworthiness of qualitative research findings. Triangulation can be performed through several ways, such as using additional methods, different sorts of data, multiple theoretical perspectives and involving more than two researchers (Flick, 2009). In this study, all the transcripts were examined by both researchers individually and in isolation from each other to ensure researcher triangulation. Denzin (2009) suggests that this sub-type of triangulation is useful for controlling researcher biases. In the first round of the data analysis, one of the researchers analyzed the data set separately for inbred and noninbred academics as two case studies (case one and case two). The second researcher adopted an integrated content analysis while at the same time comparing and contrasting the perspectives of inbred and non-inbred academics. In the second round, two researchers agreed to consider the two cases in a holistic approach as a strategy of participant triangulation (Denzin, 2009), in which sampling should allow comparison across groups. By adopting this strategy, researchers attempted to integrate the voices of inbred and non-inbred academics from different local contexts and angles as well as employing Horta's (2013) taxonomy as sub-types (pure-inbreds, mobile-inbreds, silver-cordeds, adherents and non-inbreds) of academic inbreeding. In our sample there is no silver-corded among the participants. Direct quotes were used to achieve credibility and validity. In presenting the direct quotes, participants were coded with abbreviations such as P1-MI (mobile-inbred) and P2-PI (pure-inbred).

Results

The findings were analyzed under five main themes based on the research questions and interview questions that are designed to understand the phenomenon of academic inbreeding, as shown in Table 2.

Table 2 Systematic of the findings

Interview Questions	Themes
1. In your department, what kind of criteria are taken into consideration when selecting and appointing faculty, if there are candidates from inside and outside of your institution? (RQ1)	1. The criteria for selecting academics.
2. What do you think about the appointment of research assistants as faculty members within the same HE institution after their Ph.D. degree completed? (RQ2)	2. Academics' perspectives related to inbreeding
3. What are the reasons for preferring inbred academics in selecting and appointing faculty? (RQ2) 6. What do you think about the academic performance of inbred and non-inbred faculty members? And, how do these reflect in your institution? (RQ2)	5. Impact of inbreeding on academics' performance and the institution
3. What are the reasons for preferring inbred academics in selecting and appointing faculty? (RQ3)	3. Reasons why inbreeding is preferred
4. How would you evaluate the limitation of employing inbred faculty members via legal regulations? (RQ4) 5. What kind of a balance should be sought between the inbred and non-inbred academics' employment? What are your suggestions? (RQ4)	4. Views on the limitation of inbreeding by legislation

The criteria for selecting academics

Both inbred and non-inbred participants have similar opinions about the quality and potential contribution of academics in terms of selection criteria (Table 3).

Table 3 The criteria for selecting academics

Inbred department	Non-inbred department
• Qualification: objective criteria, academic performance, merit	• Qualification: highest score
• Knowledge of a candidate's performance	• Having a master's or doctoral degree abroad
• Potential contribution to the department	• Potential contribution to the department
• Its own alumni	• Being experienced in different academic circles
• Personality traits	

As presented in Table 3, while the inbred department gives priority to its graduates, the non-inbred department hires academics who have their graduate degrees abroad. In the non-inbred department, this is not a preference but is obligatory. In the inbred department, to have previous knowledge about personality traits and prior performance (contribution

to their institution) of the academics is valued as much as a person's academic performance. For example, P1-MI (mobile-inbred) stated that the candidate can only be advantageous in the case of equality with these words:

> If someone with a very different performance comes, you make that decision according to objective criteria... any restrictions, such as the subject of the thesis or something else, are specified in the vacancy requirements. The department would be pleased if the academic is the one with whom they are familiar, but it doesn't go through a process of bias to prevent an unknown academic. But in the case of equality, I prefer the person I know, whose performance and personality I already know.

A non-inbred adherent academic (P16-AD) describes their approach as follows:

> Our appointment criteria are very clear and written. If the applicant has a higher score, s/he is hired. It's that simple. But if we are really looking for an academic who will teach on a certain subject then we try to hire that academic, this situation can be justified. Otherwise... everyone hears it, and you'll be really humiliated in the department, like 'What? Are you trying to hire your guy?'

While the criteria for selecting and promoting academics appear objective and performance-based, they may be managed in favor of insider candidates, depending on the preferences of departments. In addition, the similarity in the inbred department can be seen as a reason of preference and a requirement for the continuation of academic culture, while academics in the non-inbred department consider it as a problem in corporate culture. In other words, both pure-inbred, mobile-inbred and non-inbred adherent interviewees stressed the potential contribution of the prospective academic to the university. Nevertheless, the inbred participants prioritized the previous strong ties with the institution and institutional loyalty. Horta and Yudkevich (2016) argue that such kind of academic hiring practices hampers knowledge production and the advancement of the HEIs. Further, academic inbreeding is assumed to create a limited scientific environment in which to conduct interdisciplinary and/or multidisciplinary studies, since it hinders questioning and leading to new insights and ideas (Horta et al., 2010).

The non-inbred adherent participants, however, agreed that transparent and competitive recruitment, higher academic qualifications, international research networks, recruitment of the best candidates, and international masters and/or doctoral research are the main criteria in identifying internal or external candidates. Altbach et al. (2015) emphasize the importance of the internationalization of academics and students to face increasing pressure on university

rankings and polishing institutional profiles worldwide, yet, inbred academics are claimed to fail to have universal awareness and ability to cooperate with the international academic community. Dutton (1980) also claims that inbred academics lack capabilities in maneuvering in the national and international academic marketplace, and achieve lower levels of academic success due to their immobility. Parallel with the quotes of the non-inbred adherent academic provided above, the open recruitment process was found to reduce academic inbreeding by enabling competition for the available vacant positions and diversifying the candidates to a greater extent (Horta et al., 2011). Bearing on the data, this theme suggests that pure-inbred, mobile-inbred and non-inbred adherent academics differ in implementing recruitment criteria.

Academics' views on inbreeding

Participants find inbreeding both right and wrong, while some think that it should be evaluated according to the conditions (Table 4).

Table 4 Academics' perspectives related to inbreeding

Inbred Department	Non-Inbred Department
Reasons for finding inbreeding right	*Cannot be considered right or wrong*
• Opportunity to employ qualified academics	• Depends on the performance of the insider
• Desire to employ the trusted academics	• Acceptable at a certain rate (e.g. 15-20%)
• It is a well-functioning practice	
• Need for maintaining the academic culture	
Reasons for finding inbreeding wrong	*Reasons for finding inbreeding wrong*
• Preventing fresh blood coming to the department	• Perpetuating problems in the current culture
• Causing academic blindness	• Monophonism, uniformity
	• Resembles an incest relationship
	• Urbanization of the university (localization)

As shown in Table 4, inbred academics appraise inbreeding positively while non-inbred and adherent academics bring severe criticism. Some academics stated that inbreeding is especially necessary for the protection and maintenance of academic culture. The non-inbred academics criticized inbreeding for causing academic blindness and localizing the university, despite also having some positive elements.

One of the academics (mobile-inbred) expressed these disadvantages repeated by different participants (P1-MI), '*A doctoral student can continue this culture without changing it. And if there is a problem in that culture, those problems can also be transferred to the future.*' Another adherent academic stated that non-inbreeding prevents academics from being indebted to each other (P12-AD), '*It prevents people's need for each other, because no one is anyone's master or doctoral student, so the academics see you as a colleague rather than a former student.*' One academic stated that inbreeding "urbanizes" the university since the academics

could not get away from the influence and power of the senior professors (P15-AD). Another non-inbred adherent academic likened inbreeding to incest and stated that it is a problematic approach (P16-AD):

> It is something like an *incestual relationship.* Just as we expect our children to establish their worlds after a certain age, to live their reality... When you continue with the people you raised, blood breaks down somewhere. Therefore, it becomes a repetitive system that cannot renew itself. Therefore, it is one of the most harmful things for academia.

Some academics avoided evaluating inbreeding as right or wrong, asserting that it is more appropriate to handle inbreeding with its positive and negative aspects, and to focus on one's performance. However, there was a general agreement among inbred adherent academics that academic inbreeding may be necessary for the maintenance of institutional tradition and culture. Preserving institutional culture and traditions is a critical driver of academic inbreeding, as reported by İnanç and Tuncer (2011) as well. Further, there appears to be a positive association between academic inbreeding and trust-based personal relationships, based on pure-inbred and mobile-inbred academics' opinions. Yudkevich et al. (2015) also pointed out that inbreeding perpetuates the institutional or departmental culture and relationships already existing in the institution whilst reproducing the power dynamics. However, some pure-inbred academics claimed that inbreeding may be problematic for HEIs because it may create particularism and limit new ideas in academia. This argument agrees well with Altbach et al.'s (2015) findings, which suggest that inbreeding may foster particularism in contrast to universalism.

Further, non-inbred adherent academics emphasized that academic inbreeding cannot be considered as completely problematic or useful, and therefore it should not be ended by decree, yet a limited number of academics concerning merit-based recruitment may be allowed by the HEI administrations. However, it is important to note that non-inbred participants widely expressed that inbreeding may bring homogeneity, encourage hierarchical relationships within the institution, cause localism and particularism, and transfer of existing culture to prospective academics.

Given the variety of issues raised by the non-inbred adherent academics, it seems that inbreeding takes hold of several dynamics in organizations. Horta and Yudkevich (2016) propose that inbreeding produces homogeneity pursued by organizational stability, that is, inbred-oriented institutions are seized by organizational traditions, long-established norms, values, and habits. Correspondingly, the hierarchy may be fundamentally entrenched within the department due to the perennial power relations tied strongly between senior professors and newly hired junior academics (Gokturk & Yildirim-Tasti, 2020; Horta et al., 2011). Finally, participants placed a particular emphasis on localism, which is argued to be related to academic inbreeding (Sivak & Yudkevich, 2012). Localism in higher education generally

involve the local circulation of the faculty, publishing with a local social network in local/national journals, and meeting the need for the human resource from local communities (Gorelova & Yudkevich 2015; Horta, 2013). Therefore, localism inevitably provokes the reproduction of local professional norms scheming the teaching and research activities comprehensively (Sivak & Yudkevich, 2012). Concomitantly, localism cause isolation from external norms and practices, lacking a broader intellectual community and outlook necessary for achieving academic development (Dutton, 1980). Overall, localism damages the HEIs and produces flaws, creating increasingly competitive and accountable academic environments and organizational climates.

Reasons for preferring inbreeding

Both inbred and non-inbred academics believe that inbreeding is preferred for cultural reasons and the tendency to maintain order (Table 5).

Table 5 Reasons for preferring inbreeding

Inbred department	Non-inbred department
Cultural reasons: The predominance of feudal relations in Turkish culture • Personal relationships being decisive • Favoritism and nepotism • Partisanship • Having similar ideologies • Being close to administration	Cultural reasons: • Eastern and Muslim culture (people feel strong and safe in a particular group) • Nepotism
Desire to maintain the current academic culture	Desire to work with people who will not threaten the built-in order
Desire to choose people who can work compatible	Desire to retain power and establish dominance over academics
See outsiders as a risk or threat	• Unwanted difference or innovation: to protect and maintain the same mentality • Not facing resistance, not choosing people who can force the order and challenge it • Staying inside the comfort zone
Respect for the academics' past work for the institution	When there is an open position, the people in the close circle are informed

As shown in Table 5, inbreeding is preferred mainly for cultural reasons like protecting current academic culture and the status quo. An adherent participant (P11-AD) reported a difficulty in announcing their vacant position as follows:

A vacancy for an assistant professor was given to our department, we made use of all the resources, but we could not access lots of people. Whom could

we reach? People we know. It may be due to this. … Of course, people around that university hear this news.

Cultural reasons come to the fore both for inbred and non-inbred faculties likely due to the fact that Turkish culture is imbued with feudal attributions, and feeling safe in groups has been referred to as pathological aspects of insider feeding. The participants addressed these pathological and detrimental aspects of inbreeding, linking feudal qualities with Turkish culture and also the eastern culture. For example, a mobile-inbred academic (P2-MI) uttered,

> Turkey is still a society that tries to conduct business with feudal relations. So, our data sources are oral culture, our observations and personal. I'm not saying it should be a measurement or not. I'm not saying that is wrong. But that is the case. If people are going to work with someone, they want to work with whom they want, not with the student who gets the highest grade. And I, for my part, would like to work with the person I believe I can work with, not the person who got the highest grade. Because the validity and reliability of the tools that lead to that grade are always controversial. But the validity of these changes when you are employees and managers of a public system. There should also be acceptable criteria, standards, and values.

Another non-inbred adherent participant emphasized the practices of the eastern culture as follows (P16-AD):

> For me, the most important thing is that it is an eastern culture and a Muslim country…. Either you're on me or you're not... Second, people can see themselves academically strong in the groups. I mean, for some reason, they cannot do an individual study. For example, they are afraid to express their opinion, not even to express their academic opinion in environments where they do not feel safe... I've seen these examples... Once, our friend became head of the department… for example, a former faculty comes and says, 'do this like this.' The job descriptions are obvious. If the academic is in that position, they will do their duty, whether they are your student or not. But it's controlling… it's like sectarianism... communities of practice… these are a community.

Inbreeding is considered as a legitimate practice to meet the need for faculty in a short time, to respect the experience and time of the internal candidate within the institution, to have the opportunity to recognize and observe highly-academically-oriented students during their graduate studies in the home university, and to be able to inform only the immediate

circle when a vacancy is available. However, interviewees mostly considered inbreeding motives as damaging to the institution due to the risk of exacerbation in personal relationships, remaining in the comfort zone, preference to familiar persons/graduates, provincialism, academic nepotism, particularism, parochialism, maintenance of institutional culture, home-grown norms and traditions. Indeed, these motives of inbreeding are closely related, and often happen at the same time in an institution, causing and affecting each other.

Provincialism generally emerges in the academic promotion patterns in highly inbred-oriented HEIs (Cattaneo et al., 2019). Likewise, particularism inevitably promotes institutional parochialism. In this way, personal or in-group-membership oriented recruitment dominates hiring practices, leaving almost no chance of being hired for external candidates (Dutton, 1980; Gorelova & Lovakov, 2016). These issues especially demonstrate a negative impact on both academics' and institution's scientific achievement and improvement, solidifying institutional proximity (Horta et al., 2010).

Conservatism is also observed and supported in inbred institutions (Dutton, 1980), resulting in isolation from the rest of the academic world. That is, conservative practices and values are praised and encouraged, jeopardizing institutional vitality, such as maintenance of established traditions, already existing institutional culture, and remaining in the comfort zone (Pan, 1993). Similarly, eastern culture values and characteristics were claimed to be among the markers of inbreeding in Turkish HE. Eastern cultures are basically identified as collectivistic cultures, where tight social bonds and links and belonging to large groups are valued based on and in exchange for loyalty (Darwish & Huber, 2003). Building on this argument stated by the participating pure-inbred, mobile-inbred and adherent academics, Turkey's collectivistic culture may be considered among the potential motives of inbreeding in its HEIs, as well. However, in a recent study, Horta (2022) claims that academic inbreeding is still observed in developed higher education systems as the United States and the United Kingdom.

The practice of inbreeding in academia also leads to heterogeneity in institutions. Power owners and central professors in the departments determine and form the accepted type of academics, and foster the reproduction of the same identities, approaches, ideas, and even ethnicities within the departments. That is, the chief principles of academia—diversity, equity and inclusiveness—are neglected concomitantly (Horta, 2003; 2022).

Views on the limitations of inbreeding by legislation

The views of the participants on the limitations of inbreeding are presented in the Table 6 comparatively.

Table 6 Views on the limitation of inbreeding by legislation

Inbred department	Non-inbred department
Should be limited (to an extent) • Provided that the tenure of the academics is secured • Mobility opportunities should be developed • Provide a different perspective	*Should be limited (to an extent)* • But not enough to solve the problems caused by inbreeding in Turkey. • May inhibit the culture of allegiance. • May not be essential for elite universities but may be required in the provinces
Should not be limited • But it should be encouraged • It causes reactions • Not humane • The university should decide • There is no scientific evidence to support such a limitation	*Should not be limited* • But it should be encouraged

As shown in Table 6, inbred academics think that inbreeding should not be restricted, while the non-inbred adherent academics dominantly think that it should be limited. A mobile-inbred participant (P1-MI), who advocated restricting inbreeding to a certain extent, stated that the university should encourage the academics to gain different experiences:

> At certain stages of an academic career, such things should be encouraged at home or abroad. Put it in the legislation, but also provide support... These are good things for a university, of course. The university should encourage this but the position should be secured when they return to their home institution (P1-MI).

Another academic expressed that there is no guarantee that the non-inbred academics will always be better, and even that they may not be able to adapt to the culture of the institution, and may harm it. However, an adherent non-inbred participant (P11-AD) stated that it would be appropriate for each university to set a limitation:

> Academic inbreeding is perceived as a bad thing. It has a negative reputation. There is no such thing that every candidate you receive from inside will be good, and vice-versa... or you can get such candidates from outside that it can spoil the culture of the institution. That's a bad thing then. So maybe the criteria we're looking for in a new candidate should be clear. But on paper, I think every university should have a numerical limit. Especially in a country like Turkey, where the rules are not very applied. I think it is important that there is a legal obligation to make decisions at the policy level.

The majority of participants emphasized that it would be reasonable both to promote and limit the number of inbred academics by decree, based on various justifications. For example, a mobile-inbred academic (P1-MI) claims that inbreeding should be preserved and consolidated, if not reinforced, via the possibility of having people who might have benefitted from a limited span of time abroad. Non-inbred adherent academics highlighted that such limitations could end or dwindle away the prevalence of culture of the submissiveness within the institution. As Tavares et al. (2015) stated, inbreeding would be less likely to emerge in an institution where loyalty to diverse (insider or outsider) groups is not welcomed and appreciated. On the other hand, inbred academics confirmed limiting the practice of inbreeding on account of immobility, consolidation of academic staff, and lower levels of innovation that inbreeding brings in. Similar results were also reported by Horta et al. (2010) and İnanç and Tuncer (2011).

Indeed, although the Higher Education Law explains the procedures and principles of appointment and promotion of faculty members in HEIs, there is no specific regulation restricting or encouraging inbreeding in HEIs. Yet, within this law, it is stated that 'HEIs can require additional objective and auditable criteria, taking into account the differences among scientific disciplines, in order to increase scientific quality exclusively, by taking approval of the COHE in appointments and promotions' (article 23/c). Therefore, based on this statement, we could expect HEIs to restrict or prevent inbreeding formally through respective criteria. As yet, however, the number of HEIs that have limited or prevented academic inbreeding is rather low.

Participants who were against the idea of setting a limitation to inbreeding as a hiring policy commented that it would be unfair to restrict the practice, and therefore would draw a serious reaction from inbred-oriented HEIs. Indeed, universities could suffer from hiring external candidates due to legal restrictions if the internal candidate is superior to the external one (Horta & Yudkevich, 2016). Another essential idea mentioned was not to employ decree regulations to prevent inbreeding at the national level, but to encourage academic mobility by relaxed regulations at the institutional level. Likewise, interviewees in Horta and Yudkevich's (2016) study also stressed that eliminating inbreeding through law would be harmful, which would most probably involve mandatory mobility of academics, and damage the research path and career trajectory of the academics. Yet, regulations to limit the practice of academic inbreeding are assumed to have substantial potential in terminating the proliferation of inbreeding (Horta et al., 2011; Pan, 1993). Similar regulations introduced in the Russian HE system are acknowledged, however, there is an important caveat to bear in mind: their effects are not clear yet. In China, top universities and an increasing number of universities do not allow the employment of their Ph.D. graduates any more to eliminate the negative impacts of inbreeding (Altbach et al., 2015), as well.

Aligned with the rise of audit culture and competition around the world, the higher education sector in Turkey has also adapted new public management to enhance academic performance and efficiency. As yet, however, these intended policies have not been reflected

in human resource and talent management in practice enough. These transformations seem to take a longer time to be implemented efficiently both in university management practices and nation-wide academic labor, as in international HEIs.

Impact of inbreeding on academics' performance and the institution

Participants' opinions on the impact of insider recruitment are summarized in Table 7.

Table 7 Impact of inbreeding on academics' performance and the institution

Inbred department	Non-inbred department
There is a difference in performance • The quality of those coming from outside the education faculty is higher (bachelor's degree is meant). • The insider gets unnecessarily tied to its roots. • Outsiders are more productive and project-oriented, but dropped out of academics for 5-15 years due to vicious conflicts.	There is a difference in performance • A non-inbred academic can bring a different perspective while teaching • A non-inbred academic can contribute to the development of international connections and joint projects.
There is no difference in performance but; • A non-inbred academic has no debt to anyone. • Non-inbreds do not put their hands under the stone. • Non-inbreds can see themselves as guests.	There is no difference in performance but; • Non-inbreds' international connections are stronger. • Non-inbreds can publish more internationally. • Non-inbreds hesitate more and they do not see themselves as real members. • Non-inbreds are more emotional and have a bond of loyalty. • Non-inbreds are more visible in community service. • Non-inbreds have higher self-sacrifice and belonging in serving the institution.

Non-inbreds differ in their qualities, such as introducing students to different perspectives, being more productive, project-oriented, and having strong international connections. One pure-inbred participant stated (P3-PI):

It seems to me that if the academics coming from different disciplines are a little higher… or I think they're more open-minded… an academic who has graduated from the faculty of education and becomes an academic at the same university unnecessarily depends on their roots (they say so) and their history. This dependence has no contribution to academic performance… I also see that as the time spent in that department increases, this difference decreases and the academics try to resemble their colleagues. They cannot escape, so they start to turn into the people they criticize. This kills efficiency.

Another adherent participant in a non-inbred department emphasized that non-inbreds have stronger international connections (P16-AD):

> Academics with a Ph.D. from abroad have better international networks... these people write projects easier, they do their job better with international scholars in an easier way. They go to international conferences much more... But the academics who grew up in Turkey find it enough to go these conferences once every five or 10 years. They mostly go to national conferences. Both are important. But the international network is very important. Science is not something that can be done alone.

Non-inbred academics are considered not to embrace their jobs in the institution as much as those who are from within the institution, with the words no debt to anyone (P6-PI) and like a guest (P2-MI). A mobile-inbred academic said:

> Here, for things to go right, another dynamism is needed in terms of both bureaucratic and relational aspects. The university also needs an internal mechanism. In that internal mechanism, the university's graduates, that is, the inbreds, especially the ones having undergraduate and graduate degrees, have a very strong connection with the university. You have research, you teach, you are overworked, but you are willing to make such a sacrifice. I observe this higher in inbred academics... For example, since I did not graduate from here, there is no such area of sacrifice for me, because I do not create such a thing in my mind. I will do research, I will do very well, I will do research and teaching, I will be good with my students, that's it. I do not have a motivation like loyalty. But there is for inbred academics. Maybe there are other such motives for them. But this is the most obvious I have observed so far.

Some of the participants both from inbred and non-inbred academics stated that there was no substantial difference between inbred and non-inbred academics' productivity and performance. Yet, research has proven that inbred academics are less productive than their non-inbred colleagues (Dutton, 1980; Eisenberg & Wells, 2000; İnanç & Tuncer, 2011). Inbred and non-inbred participants also agreed upon the idea that inbred colleagues have higher levels of institutional commitment. This result appears to tally with Altbach et al.'s (2015) research that inbred academics spend time on teaching and administrative duties that make them more visible among their colleagues, as they do not have an intention to leave the institution, so they do not invest their efforts in research and publishing.

Inbred and non-inbred participants were consistent about non-inbred academics' superiority in participating in international knowledge networks, engaging in international

collaboration projects, and publishing in international peer-reviewed journals. Similar results were obtained by Sivak and Yudkevich (2012). Also, non-inbred academics were claimed to value cooperation at the international level more than their inbred colleagues, whereas inbreds prefer publishing in local university journals and nationwide academic journals (Gorelova & Lovakov, 2016). One last main category that emerged within the current theme was inbred and non-inbred academics' claim that non-inbred academics are not involved in some institutional culture patterns, such as mentoring and hierarchical relationships, that emphasize institutional hierarchy and loyalty over academic quality and collegial relationship. Non-inbred academics might be quite often less willing to be involved in long-established yet unfair power structures, some departmental projects, and routines. In this way, they would be referred as a visiting academic in their department from the inbred academics' standpoint, as reported by Horta et al. (2011).

In sum, these highlighted dynamics, issues, and concerns associated with and attributed to the impact of inbreeding on the institutions and academics' performance under these themes present a thorough overview of participating academics regarding the phenomenon of academic inbreeding from different perspectives in Turkish higher education, as shown in Figure 1.

Figure 1 enables us to understand the main characteristics of inbreeding as perceived by academics from different academic climates. The findings also suggest that inbreeding cannot only be restricted to the HEIs; instead, the impact of the wider context (e.g., institutional and contextual factors, nation-wide policies) should also be taken into consideration for accurate implications about the extent of academic inbreeding in practice. That is, the phenomenon of academic inbreeding should be approached at multiple organizational levels.

Conclusion

This paper extended the usual way of investigating academic inbreeding beyond scholarly productivity, stressing the organizational commitment and organizational stability aspects as a necessity for higher education institution's sustainability. This, in turn, suggests a promising positive reflection on academic culture that is different from the prior studies, which concentrated on its relationship with scholarly productivity.

Figure 1 Themes and sub-categories

Inbred academics perceived inbreeding as a way of maintaining academic culture, whereas non-inbred adherent academics perceived inbreeding as a problem for organizational culture. Taken together, the presence of inbreeding at certain levels is considered important for maintaining the organizational culture. Cultural characteristics emerged as the prominent causes of inbreeding. Despite the empirical research proving the damaging effects of academic inbreeding, this research adds its positive aspects such as providing better opportunity to observe the academic candidate and to employ qualified academics as it enables long-term observation about an academic's performance. However, the results of the study also suggest that academic inbreeding in HEIs leads to the reproduction of power relations, ignoring the principles of diversity, equity and inclusiveness at higher education level. Further, one of the main contributions of this study lies in demonstrating the importance of societal and contextual factors to understand the prevalence and appropriateness of the phenomenon for the HEIs.

Inbred academics have an advantage of embracing diverse perspectives in lectures, having strong international connections, being project-oriented, and more productive in terms of international scientific publications. Although the procedures and principles of appointment and promotion of academics in HEIs are not restricted or encouraged in the Turkish Higher Education Law, claiming strict limitations on hiring policies needs more strong evidence including the developing universities. Indeed, the centralized higher education system in Turkey, and thus the ability within the Turkish COHE to make a fast decision would make it fundamentally easier to navigate the path forward regarding of academic inbreeding, once the higher education stakeholders make a nation-wide decision on handling the issue.

HE administrators, especially university rectors, should take this issue to their agenda related to the recruitment policies to achieve human resources and talent management parallel to their organizational goals and strategic plans. It would be early to draw any solid conclusions on the data obtained here to set general hiring policies limiting or encouraging this practice, since our study is limited by a relatively small sample size owing to its qualitative nature. As a result, in Turkey we need more evidence-based research capturing a wide range of scientific disciplines and departments from both newly developing and long-established universities.

In sum, this study could act as a reference point providing a comparative standpoint based on a wide variety of ideas, perspectives and arguments stated by the inbred and non-inbred academics. Consequently, issues and concerns raised here could be addressed and examined critically taking into consideration the contemporary patterns in international HE.

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Examining academic synergies from international collaborations: The South Korean context[1]

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Abstract

To facilitate globalization, universities exchange human resources with overseas institutions by fostering synergies in research. This paper aimed to examine academic synergy gained from international collaborations in the Korean context, analyzing the government meta-data on global partnerships and research outcomes of 140 South Korean universities. Results from the proposed pilot model show that the number of partners in non-English speaking countries significantly affected international publications (IP) conceptualized as academic synergy; the numbers of outbound resources and the numbers of enrollees to graduate schools were also influential to IP; and IP from the private universities in rural areas appeared relatively lower. This pilot study using publicly available sources is noteworthy because it examines synergetic effects from international academic connections with overseas institutions.

Keywords: academic synergy, international collaborations, research performance evaluation, higher education, South Korea

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Introduction

In social sciences studies, synergy effects on mergers and acquisitions (M&As) as well as strategic partnerships between commercial firms have been widely examined. Existing literature in synergy management postulates many analytic methods to evaluate tangible and/or intangible synergies from firm-to-firm collaborations (Garzella & Fiorentino, 2017; Harvard Business Review, 2001). In contrast, empirical evidence that reflects synergetic academic gains from university-to-university cooperation and a synergy value generated by cross-institutional collaborations is rarely seen in higher education research (Kim, 2017). To expand the global reach and university education network, many higher education institutions (HEIs) in South Korea (*hereinafter*, Korea) have provided their faculty members, competent researchers, and promising students with international partnership opportunities such as *the Study Abroad and Exchange, and the International Academic Exchange* programs (Lee & Cho, 2021). According to the Ministry of Education of Korea (*hereinafter,* MOE), as of February 2022, 178 HEIs have managed 28,077 inter-institutional bi-/multi-lateral agreements on global exchange programs and research internships with universities and polytechnics outside Korea since 1964, and this trend has been continuing, fueled by the Korean MOE's strong policy supports. For these reasons, academic synergy from the extensive international collaborations between non-profit institutions should also be empirically examined from the HEIs' perspective.

Originally from the Greek "συνήρχος (sunergos)," synergy conveys working together, and its modern meaning is "the interaction of two or more agents or forces so that their combined effect is greater than the sum of their individual effects" (Schlunze, 2009, p. 184; Talaba, 2007, p. 2). Co-working with partners helps universities enrich research output not only on an individual level but also on a school level, representing a dynamic cooperation process that involves mutual learning and joint tasks between them (Kim, H. Y., 2018; Schlunze, 2009). International academic cooperation has a history of over a century (Woodard, 2018); it is "a voluntary activity" for richer research outcomes, as academics co-work for publications to create academic synergy (Cai, 2007, p. 32). As such, sustainable co-working and mutual research performed with foreign peer institutions are key to an academic collaboration, which is initiated for promoting long-term international research competence (Liu et al., 2018).

A growing literature in higher education has focused on developing human synergy and observing the effect through individuals in a joint learning environment, while universities are also interested in fostering academic synergy on an organizational level and real synergetic gains from inter-institutional collaboration across borders (Cai, 2007). Since strategic, operational synergies in partnerships, alliances, and M&As between enterprises have been quantified based on financial statements and market reports, academic synergies from international engagement, which includes participating in inter-institutional research projects, can be evaluated similarly using reliable secondary data about the operation of institutions (Garzella & Fiorentino, 2017; Lewis et al., 2015; Liu et al., 2018). However, high-quality refined

public information on HEIs in a structured form is not easily found for those who want to seek the examination of synergies in academia.

To ensure quality international education in the long term, since 2004, the MOE has provided stakeholders and outsiders, including education professionals, post-graduate applicants, and trustees, with diverse disclosure information, in an electronic format, about standard-based performance outcomes of the Korean institutions on a yearly basis, ranging from school operations, education investment, and global exchange programs to academic performance (Higher education in Korea, 2022; Oh, 2016). The disclosed data set, in association with the extensive statistics regarding annual research performance at the inter-institutional level, is suitable for practitioners to examine quantitatively the existing and potential academic outcomes within the joint research environment across countries (Kim, 2017; Lee & Cho, 2021).

To cater for these research needs, this study aims to examine synergies in academic research from international collaborations with overseas partner institutions by using actual data of South Korean universities. Our underlying research question is: How can we examine academic synergies from international university collaborations? Analyzing different synergies in a knowledge-based society at the different levels at which it may be identified is meaningful to stimulate explicitly the synergy effects between universities, particularly within international collaborations (Talaba, 2007). Therefore, this paper will offer a theoretical, practical value to higher education experts developing the synergy concept, measuring the potential synergies, and realizing new synergies in scholarly research.

Background

Academic synergies in research

The recent viewpoint on synergies differs in major focus and key interests from the academic fields of Humanities, Arts, and Social Sciences, including Business and Education (see Table 1). Except for Business/Management, whose concerns are result-oriented in nature, the common keywords over the four areas involve the broad concepts of *process, value and effects* from *collaborative scholarly outcomes* and *research performance*. The extant literature in Higher Education describes academic synergy effects through teaching, learning, and researching mainly at three levels: individual, intra-group, and inter-institutional levels (Munro et al., 2015; Wicking, 2020, Yeo et al., 2021). Academic synergies from individuals are achieved when collaborative teaching/learning between peers occurs in the HEI environment where teaching staff and learners are positively influenced by each other. Therefore, synergetic threads among the individuals in the university are formed to maintain a constant motivation and enthusiasm towards their study (Fufa & Kimo, 2020).

Table 1 Synergies viewed from the perspectives of humanities, arts and social sciences

Areas		Major focus	Concerns	Literature
Humanities		Cooperative collective intelligence, Cognitive cooperation for knowledge convergence	Process	Kim (2017) Liu et al. (2018) Ma & Runyon (2004) Schlunze (2009) Sursock (2015) Talaba (2007) Yeo et al. (2021) Yoon & Cho (2017)
Arts		Collaboration for an integrated brand, Combined images and expertise	Value	
Social Sciences	Business (Management)	Strategic inter-organizational activities, Joint actions seeking win/win solutions	Impacts, Consequences	
	Education (HE-related)	Collaborative research outcomes, Human resources association	Effects, Efficiency	

Talaba (2007) considered that teaching synergy is observed on an individual level as the nature of teaching, but the synergy in teaching through collaboration activities is practically impossible to define. Relying on a Delphi survey technique, Kim (2017) deduced that synergy in learning could be found in group collaboration and related collaborative learning. In addition, through all individuals' argumentation, learners in groups can synergize their work by transforming pre-existing ideas into findings. The performance of the group argument may be higher than all the members' individual arguments (Yeo et al., 2021). In contrast, inter-institutional research synergies, including collaborative research activities and scientific research services between universities, may be measured by analyzing shared costs, co-funding, joint research project outputs, and university research performance (Liu et al., 2018; Talaba, 2007). The synergistic value of academic scientific research between institutions is fostered in a complex situation where synergy might result from university mergers as well as strategic collaborations between partner universities (Cerisola, 2018).

Being led by policymakers and educational authorities, university mergers have occurred in many countries to improve HEI's efficiency and educational outputs as well as to restructure education operations in academia since the 1990s (Estermann et al., 2013; Liu et al., 2018). The driver behind this is that the growing pressure of the knowledge-based economy has placed universities at the center of ongoing globalization and competitiveness agendas (Liu et al., 2018; Sursock & Smidt, 2010). The imperative for most universities in a global economy imposes strategic actions concerning the promotion of academic synergy by achieving critical mass, as a benefit of the mergers, in education as well as research and development (R&D) (Helerea et al., 2007; Liu et al., 2018; Ljungberg & McKelvey, 2015). In contrast, rather than university mergers, the Korean HEIs have tended to encourage international partnerships with overseas HEIs to increase institutional research capabilities and knowledge production by expanding global exchange programs as a core part of international university collaborations for faculty members, academic researchers and university students until the mid-2010s (Ko, 2017; Sol, 2020). From partnering between institutions, the synergetic effect can also be observed at the university level when faculty members and human resources share their intellectual talents and expertise, combine

technological resources, and increase academic productivity in institutions (Helerea et al., 2007; Ma & Runyon, 2004).

Most HEIs are expected to create interdisciplinary combinations that will improve their research performance (Georghiou & Harper, 2015). Significant synergies from research and educational activities, in the research-intensive universities, are created by international publications and scholarly outcomes in conjunction with the collaborative process, raising research competence and performance during the team tasks, and exchanging new knowledge and emerging skills in a group collaborative, research-based learning environment (Fufa & Kimo, 2020; Kim, 2017; Liu et al., 2018). As such, in the understanding and measuring of academic synergies in the Korean context, this study, with a lens of HEI in Social Sciences, focuses on global exchanges and collaborative research outcomes (Liu et al., 2018; Ljungberg & McKelvey, 2015) obtained by exchanging human resources at the inter-institutional level.

International collaborations across universities

A number of institutions that concentrate on international 'research-led' joint activities ensure links between education and research, and they are incorporated into post- graduate and undergraduate programs by including a variety of measures, such as research training for undergraduates and the development of post-graduate programs in HEI research centers (Delgado & León, 2015; Talaba, 2007). This situation is more clearly seen at the universities where extensive human resources are swapped through bi-/multi-lateral global exchange programs (GXP), as the HEIs increasingly attempt to improve global visibility and awareness, cross-cultural skills, and international competitiveness, particularly in non- English speaking environments (Lee & Cho, 2021; Liu et al., 2018; Munro et al., 2019; Wicking, 2020).

Writing for publication is stimulated by other people through the collaboration process where domestic and overseas parties are involved (Heron et al., 2021). Researchers have mentioned that the synergies, which are needed for steady interest toward co-research in academic settings, are widely shown when involving academic works across multiple countries (Lewis, 2015; Wicking, 2020). Moreover, academics discuss the importance of synergies required when conducting international, multicultural work; multi-national tasks enable a successful collaboration while also enhancing multiple, overarching, overlapping, and interacting institutional interests (Cai, 2007). Synergies from joint activities that result from the combined efforts with research peers are discussed within global contexts between English-speaking countries (ESC) and non-English-speaking countries (non-ESC), where international collaborations across HEIs are the main interests (Jang, 2009; Kisselburgh et al., 2009).

Since the early 2000s, the Korean MOE has implemented various accreditation programs to guide public and private universities to a global standard in teaching-learning and R&D to higher education. To these, the government body has also introduced multiple quantitative sub-criteria, including GXP agreements with foreign partners in ESC/non-ESC, inbound/ outbound resources by GXP, and enrollees to graduate schools by GXP (see Table 2) in the

qualification programs (Kim & Lee, 2017; Ko, 2017). While such institutional measures have worked positively in many Korean HEIs, most private campuses in the provincial/ rural areas have been unsuccessful in providing satisfactory academic performance, even though they have managed a number of GXP agreements and resource exchanges over the years; besides, the size of human resources, such as the number of faculty members, also influences the international collaboration activities within Korean HEIs (NRF, 2022; Lee & Cho, 2021). Likewise, in this study, we select the GXP-related variables and a potential control factor by reviewing the relevant papers to the design of this work on the academic synergy examination in the international collaboration context. Our research hypotheses are as follows:

(1) There will be a significant relationship between academic synergy and international collaborations.
(2) There will be a significant difference in academic synergy across the university groups.

Table 2 Constructs and variables

Constructs	Definitions	Variables	Literature
Academic synergy	Scholarly outcomes across the research groups and significant international achievements at the institutional level	International publications	Fufa & Kimo (2020) Georghiou & Harper (2015) Helerea et al. (2007) Kim (2017) Liu et al. (2018) Ma & Runyon (2004) Sursock & Smidt (2010)
International collaborations	Collaborative global exchange programs (GXP) with universities in English-speaking countries (ESC) and non-ESC	GXP agreements with partners in ESC GXP agreements with partners in non-ESC Enrollees to graduate schools by GXP Inbound resources by GXP Outbound resources by GXP	Jang (2009) Higher Education in Korea (2022) Kim (2017) Kisselburgh et al. (2009) Lewis et al. (2015) Talaba (2007) Yoon & Cho (2017)
Faculty size	The number of full-time and part-time staff in Korean HEI campuses	Number of faculty members	Lee & Cho (2021) NRF (2022, October)

Methodology

Research design

We set out a statistical approach based on Korean/international higher education literature by choosing the critical variables in international collaborations shown in Table 2. More specifically, to measure academic synergy in a quantitative manner, we adopted the number of peer-reviewed, high-quality international publications from comparable examples in the field of higher education and synergy management in relation to non-profit institutions. Our research team assumes an influential relationship between academic synergy set as international publications and the possible quantifying variables in research inputs (Liu et al., 2018). As such, by referring to the extensive inter-institutional collaboration cases across overseas HEI partners, the pilot research model encompassed seven conceptualized dependent/independent variables, including one potential control factor, to be measured according to the guidelines of the Korean educational authorities and similar uses in the papers related to international partnerships and globalized education. Based on the predefined independent and dependent variable settings and the assumed associational link across the selected seven constructs, we propose the international collaborations (IC) research framework presented in Figure 1.
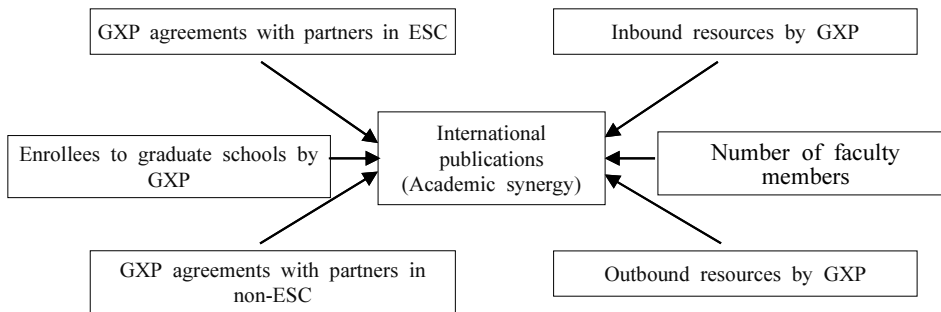

Figure 1 Proposed IC Framework – A Pilot Research Model

Data collection

In January-February 2022, we gathered formatted data from online sources on www.academyinfo.go.kr (*academyinfo*) that the Korean MOE has managed since 2008. As Figure 2 presents, the Ministry's website offers a wide range of publicly disclosed data, including the SCI/Scopus indexed high-quality journals that Korean HEIs internationally published and the latest three-year updates on international collaborations with overseas partners. Within the annual lists of the *academyinfo* webpage, we identified the related

information on a total of 189 universities. However, in a bid to lower the occurrence risks of endogenous factors in the research framework, we excluded 32 schools from collecting data because the institutions in question showed poor annual transactions in exchanging human resources with overseas HEIs for the recent three years. In this study, the research team downloaded the structured dataset including seven variable categories shown in Table 2 in spreadsheet/portable document format from a total of 157 national/private universities published in 2018-2020 (as of 2017, 2018, and 2019). Initially, we planned to gather data as of 2020 that was uploaded in 2021, but finally ruled that out as the quantity of resources exchanged with peer institutions in 2020 was extremely low because of the COVD-19 pandemic, meaning that any synergistic effect drawn over time might be distorted in generalization.

Figure 2 The Korean Ministry of Education's public disclosure category (www.acadmyinfo.go.kr)

Data analysis

Before analyzing data, to improve internal consistency and remove possible confounding (i.e., endogenous) effects that might have an impact on the research model, we filtered the data to keep a good balance of number in co-counter variables, which are not only GXP agreements with partners in ESC and GXP agreements with partners in non-ESC, but also inbound resources by GXP and outbound resources by GXP. Consequently, there was a reasonable decision to rule out 17 cases of universities from the previous 157 samples. With the public data set of a total of 29 fields on 140 Korean public/private HEIs, we finally ran the analytic tests, including descriptive statistics, bivariate correlation, multiple regression, independent-samples T-test, and univariate decision trees test, to ensure the generalizability of the results, examine the proposed hypotheses, and validate the proposed pilot framework. We used MS-Excel 365 for data editing and initial coding, as well as IBM SPSS® Statistics 28 for the statistical work after exporting the code set into SPSS.

Results

The descriptive analysis revealed that, in terms of the index of academic synergy, the mean number of international publications was 592.46 ($SD = 936.385$) and the maximum was 6,729.98 (see Table 3). Among the five variables representing international collaborations in the model, the number of GXP agreements with partners in non-ESC (142.04, $SD = 145.142$) exceeded that of GXP agreements with partners in ESC (34.71, $SD = 41.793$) in mean value. One of the 140 schools, in 2017~2019, recorded a maximum of 180 enrollees to graduate courses by GXP. Also, inbound resources and outbound resources by GXP in number showed a small gap between the two contrary factors, while inbound resources in the maximum (10,121) greatly outnumbered outbound resources (5,704) a year. The number of full-time and part-time faculty staff on average stays slightly above 1,100 people.

Table 3 Descriptive statistics ($N = 140$)

Constructs	Variables	Mean	Maximum	Std. Dev.
Academic synergy	International publications	645.56	6,729.98	974.508
International collaborations	GXP agreements with partners in ESC	38.41	273	42.670
	GXP agreements with partners in non-ESC	154.84	958	145.142
	Enrollees to graduate schools by GXP	8.67	180	19.243
	Inbound resources by GXP	684.45	10,121	1346.977
	Outbound resources by GXP	831.66	5,704	998.274
Faculty size	Number of faculty members	1117.01	5,802	994.090

The correlation analysis revealed that each of the seven variables was in a strong linear relationship with the others one by one, as Pearson's correlation coefficients (r) between academic synergy and international collaboration factors positively appeared as $0.398 < r < 0.802$ at the $p < .01$ level (see Table 4). This result enabled us to move on to a series of regression tests to identify an influential relationship between the research publications and five independent variables and a control factor, thereby testing the first hypothesis. Because the number of faculty members [V7] had the highest correlation with the variable of outbound resources by GXP [V6], rather than the variable of inbound resources by GXP [V5] addressed by the related literature, amongst all six independent elements proposed in Figure 1, this study decided to choose the number of faculty members as a control factor toward the independent variable.

Table 4 Bivariate correlation ($N = 140$)

Variables (in number)	[V1]	[V2]	[V3]	[V4]	[V5]	[V6]	[V7]
International publications [V1]	N/A	.560**	.633**	.550**	.608**	.606**	.802**
GXP agreements with partners in ESC [V2]	.560**	N/A	.760**	.680**	.541**	.615**	.656**
GXP agreements with partners in non-ESC [V3]	.633**	.760**	N/A	.398**	.507**	.655**	.666**
Enrollees to graduate schools by GXP [V4]	.550**	.680**	.398**	N/A	.806**	.494**	.631**
Inbound resources by GXP [V5]	.608**	.541**	.507**	.806**	N/A	.546**	.607**
Outbound resources by GXP [V6]	.606**	.615**	.655**	.494**	.546**	N/A	.734**
Number of faculty members [V7]	.802**	.656**	.666**	.631**	.607**	.734**	N/A

* $p < .05$, ** $p < .01$

We continued to run a multiple regression to see which value in five factors might affect the academic synergies due to international university collaborations (see Table 5). As a result, unlike the outcomes of bivariate correlation, only three independent variables—GXP agreements with partners in non-ESC ($p < .01$), enrollees to graduate schools by GXP, and outbound resources by GXP ($p < .05$)—were significantly influential on international publications.

Table 5 Classical Multiple Regression ($N = 140$)

	Variables	Unstd. B	Coeff. std. E	Std. coeff. B	t-value	p-value
International publications	*Constant*	-26.031	83.711	N/A	-.311	.756
	GXP agreements with partners in ESC	-3.555	2.090	-.156	-1.222	.224
	GXP agreements with partners in non-ESC	2.930	.758	.438	3.863	.001**
	Enrollees to graduate schools by GXP	13.186	6.786	.260	1.943	.034*
	Inbound resources by GXP	.107	.084	.148	1.277	.204
	Outbound resources by GXP	.201	.081	.205	2.488	.014*
Model summary	$R = 0.740$ $R^2 = 0.547$ Adjusted $R^2 = 0.530$			$df1 = 5$	$F = 32.407$	$p = .000$

* $p < .05$,   ** $p < .01$

Specifically, the variable of GXP agreements with partners in non-ESC turned out to be the most potent of the three factors, with a standard coefficient beta of .414 and a t-value of t = 3.984. Overall, the regression model accounted for more than 50% ($R^2 = 0.535$/Adjusted $R^2 = 0.519$) with $F = 34.720$ at the 0.000 level; it was valid to explain the research framework accordingly. Then, by performing a hierarchical multiple regression, we were able to confirm the faculty size's control effect on outbound resources by GXP (see Table 6).

Table 6 Hierarchical multiple regression ($N = 140$)

Model	R	R^2	R^2 Change	Adjusted R^2	Std	F Change	$df1$	$df2$	p-value
1	.740[a]	.547	.547	.530	667.763	32.407	5	134	.001
2	.913[b]	.833	.285	.825	407.493	226.841	1	133	.001
3	.919[c]	.844	.021	.836	394.964	9.572	1	132	.002

Model 1: a. 5 independent variables

Model 2: b. 5 independent variables, Number of faculty members

Model 3: c. 5 independent variables, Number of faculty members, and Outbound resources by GXP * Number of faculty members

* $p < .05$,   ** $p < .01$ Durbin-Watson 2.020

Likewise, the significant positive association across the salient factors in the multiple regression model might be illustrated graphically as the examined framework (see Figure 3) in which three independent variables (i.e., GXP agreements with partners in non-ESC, enrollees to graduate schools by GXP, and outbound resources by GXP) influence international publications that represent academic synergy from the international HEIs' collaboration. Therefore, the hypothesis (1), that there will be a significant relationship between academic synergy and international collaborations, was supported. Last, we made a twofold examination to look into a difference in academic synergy across 140 HEIs grouped

by location (metropolitans/rural area) and ownership (public/private), running a t-test, followed by a decision tree analysis that is known as a learning method to see data features.
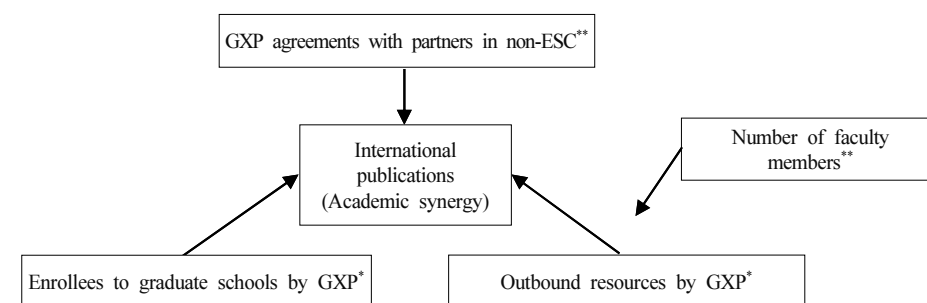
* $p < .05$, ** $p < .01$

Figure 3 Examined IC Framework － A Pilot Research Model

Last, as shown in Table 7 and Figure 4, there was a significant difference in international publications between metropolitan and rural campuses at the $p < 0.01$ level, as well as between public and private schools at the $p < .05$ level. With the t-test results presenting valid gaps between the groups, we continued to a univariate decision tree analysis by Chi-square Automatic Interaction Detection (CHAID). Decision trees, as a top-down display supporting the exploration of various effects among the selected fields, are helpful in identifying the local effects between inputs and outputs in association with descendent data subsets (known as 'nodes') and conditional relations on the interactions among the nodes, referred to as interaction effects (De Ville, 2013).

Table 7 Independent-Samples *T*-test ($N = 140$)

Test Variable	Attribute	Test group	*Mean*	*Std. deviation*	*F*-value	*t*-value	*p*-value
International publications	Location	Metropolitan	903.461	1305.714	17.742	2.734	.001
		Rural area	457.705	573.773			
	Ownership	Public	857.01	1248.461	2.672	1.518	.032
		Private	572.36	854.933			

* $p < .05$, ** $p < .01$

As shown at four nodes after [Node 0] in Figure 4, the particular group of 55 private institutions [Node 4] in rural areas [Node 2] appeared to have the lowest publications in our framework, possibly resulting from their global exchange programs. The tree's output turned out to be significant at the adjusted $p < .01$ level, showing the strong F values at each branch divided by two attributes (location and ownership) and a remarkable gap in synergies between urban and rural Korean HEIs. In line with these results, research

hypothesis (2), that there will be a significant difference in academic synergy across the university groups, was also supported.
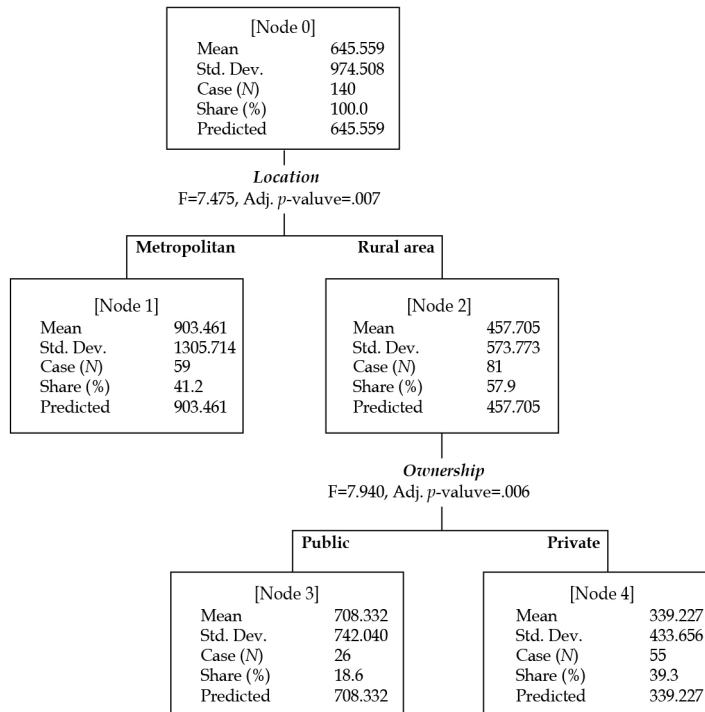
Figure 4 Univariate Decision Trees (by CHAID Growing Method: Maximum Tree Depth − Automatic, Parent Node − 10 & Child Node − 5 in the Growing Limits Criteria)

Discussion

Since the first international collaboration agreements between Korean universities and overseas institutions were made in the early 1960s, conspicuous efforts in measuring diverse academic synergies have rarely been seen in Korean academic circles. This situation is similarly observed in academia in other nations, while exchanging research groups' experiences with each other across borders becomes more common. This research, thus, attempted to answer the question, "How can we examine academic synergy from international university collaborations?" Based on the results from the multiple quantitative tests, we discuss critical findings.

For commercial firms, swapping new knowledge and emerging skills through collaborative activities is limited to realizing expected synergies (Garzella & Fiorentino, 2017;

Yoon & Cho, 2017). In contrast, this study indicates that most universities as non-profit entities reach real synergy gains at school levels by exchanging human resources and soft skills. In addition, the synergy effect obtained from university-to-university collaboration can be measurably assessed as international research output (Liu et al., 2018; Velasquez- Lopez & Rodriguez-Garcia, 2018). As such, our findings confirm that, within the Korean HEIs context, there is also an influential relationship identified between synergies in research and the international publication output, presenting the extent/level of international collaborations with overseas schools.

This study also argues that the size of GXP agreements with non-ESC partners has an associational link with the index of academic synergy in the IC research framework. Since the mid-2000s, many of the research-led, practice-focused Korean HEIs have proactively established academic ties more widely with Chinese, South/Central Asia, and European universities to raise their global indicators to a higher level, whereas they had focused on the academic networks mainly with western institutions in North America until the end of the 20th century. South Korean and Chinese co-publications in international journals in Humanities and Social Sciences have increased remarkably in the last decade (Lee & Cho, 2021). These moves in academic research to a new global reach enable the majority of Korean universities to step up economies of scale and scope in international research competitiveness.

The numbers of enrollees to graduate schools and the number of outbound resources facilitated by the faculty size in the Korean HEIs through GXP are influential to synergies in international research outcomes. In most Korean HEIs from the early 2010s to 2020, before the COVID-19 pandemic, the inbound students/candidates who looked for the Korean government's generous grants for foreign learners and a broad employment opportunity for post-study visa holders outnumbered the outbound Korean under-/post-graduate students who were more academic or research-oriented (Lee & Cho, 2021). Between inbound and outbound learning/teaching, competent Korean human resources seeking to study overseas (i.e., outbound) through global exchange programs significantly contribute to international publications, working with their home HEI researchers by cross-institutional collaboration.

Numerous private Korean HEIs in provincial cities achieve lower synergies via the international academic bridge. Currently, they face an ongoing reduction in domestic students as the small/medium towns in South Korea gradually fall in population. Their priority in school operations is to recruit international students and overseas post-graduate applicants. However, with poor research infrastructure, cultural peculiarities, and reduced private funding at the rural campuses, building inter-institutional research partnerships and providing incentives for closer joint research is anything but easy (Tseng et al., 2021). Moreover, the rural area universities commonly focus on the 'low-hanging' cooperative administrations with overseas peers to promote short-term education courses (e.g., Korean language programs), which are far from knowledge transfer and joint signatures on publications at the HEI levels; these backgrounds cause their limited synergy by research (Cho & Mclean, 2017; M. Kim, 2018).

Finally, academic synergy from global exchange programs varies in Korean HEIs by location and operators. South Korea is becoming highly urbanized; state-owned universities and financially comfortable, fine private HEIs in metropolitan areas are relatively well-positioned to set up clusters of collaborating institutions and keep up with global trends in the pursuit of emerging knowledge. In particular, government-established schools are in the advantageous position of being R&D-intensive with a high quality of education at the national policy level (Sol, 2020). Therefore, both prominent HEI groups will continue to develop attractive inter-institutional collaborations, thereby creating richer academic synergies through strategic international partnerships and research involvement.

Limitations

There are five major limitations to the paper. First, this study uses a pilot research model, which is at its initial stage. It relies first on the total number of SCI/Scopus indexed international publications as a single dependent element to measure another type of research output, to identify the quality of journals (e.g., by impact factor/citation index) and to differentiate the particular additional benefits from the international cooperation. It also relies on a series of regression tests to assess academic synergy from the global connections across HEIs. Because Korean universities in the secondary data showed considerable simplicity, our quantitative methods measured the impact of international collaborations mainly arranged by bi-/multi-lateral global exchange programs, controlling for the differential research grants/fundings and resource endowments.

Second, most existing literature on HEIs that observes the synergetic effect has focused on the phenomenon of enterprise integrations, thereby measuring the synergy value primarily from M&As during the post-integration phase; however, this work investigated the ongoing synergies in education and research from the continued international academic collaborations of the Korean HEIs, not making allowance for the analytic comparison with the pre-/post-collaborations for improved research outcomes.

Third, many researchers analyze the positive and negative effects of the collaboration results, including the critical success and failure factors (Garzella & Fiorentino,2017; Sursock, 2015). In contrast, this article in higher education looks into an overall positive mechanism regarding HEIs' research across seven elements in the pilot conceptual model.

Fourth, the data our study used also has limitations. The international collaboration-related items of the open meta-data from the Korean education authority are only six to seven fields, which may limit generalizability and scalability in interpreting the complicated phenomena of diverse synergetic effects from the HEI's research with overseas partners. Thereby, answering how-based questions (e.g., how international joint publications are produced through GXP for researcher groups with non-English speaking HEIs; how outbound resources by GXP make international contributions) was fundamentally limited.

Finally, our research was unable to control all possible influences over time on international publications from Korean HEIs. Besides, to generalize the findings independently from the highly exceptional situation in 2020, we intentionally exclude the most recent statistical data that present the 2020 university academic performance and the number of exchanging resources between schools worldwide during the first year of the COVID-19 pandemic.

Future research

Hence, future work should investigate supplementary factors in the creation of negative synergies, such as a decrease in research productivity (Ljungberg & McKelvey, 2015: 70) and the flows of future synergy by spotlighting diverse research-related attributes (i.e., external funding, infrastructure, and ethical issues) that may be shared inter-university services of global partnerships and exchange programs. Also, ongoing public secondary data collection efforts at international levels will contribute to improving the internal/external validity of assessing combined academic synergies from inter-institutional collaboration. Last, with a more rigorous methodology, such as a mixed-method approach combining path analysis and qualitative causal link analysis, the following main-stage research will analyze a multi-layered relationship between the in-depth cause-effect factors in academic synergies using cross-sectional, multi-faceted data that can present diverse international contributions.

Conclusion

This study focused on examining academic synergy gained from universities' international engagement with overseas partner institutions by referring to the specific case of 140 South Korean HEIs. To this end, a conceptual framework in terms of the examination of synergies in research was proposed, and the structured secondary data in 2017~2019 that the Korean Education Ministry provided online were analyzed using multiple quantitative techniques to ensure validity and reliability in examining synergy effects. This work suggests that academic synergy can be measured and assessed in a similar way, in case there are reliable data sources to be systematically analyzed, as the synergy-management studies in Business/Management have been. Such synergies play a significant role in improving the research output for many Korean HEIs that manage exchange programs more with non-English speaking country universities. However, private campuses in rural areas might create weaker synergies for research-oriented activities when collaborating with their overseas peers. Within the higher education arena, not only does this study demonstrate a theoretical, practical value, but it also fills in the existing knowledge gap of conceptualizing the synergistic values achieved from university-to-university collaboration by examining

relatively less-studied synergy effects within the contexts of academic research and international visibility.

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Development of global citizenship in international student exchange programs in ASEAN+3 countries: The mediating role of host university academic experiences

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Abstract

This study investigates how student experiences in international exchange programs in ASEAN countries (i.e., Indonesia, Malaysia, Thailand, Vietnam) and Korea facilitate the development of global citizenship. We build and expand upon prior study abroad research conducted mostly in North American or European countries to understand if findings and best practices based on the Western context are also applicable to the Southeast Asian region and Korea. We focus attention on how student characteristics are mediated by program experiences abroad that contribute to global citizenship outcomes. Results based on structural equation modeling show that students who report a strong interest to expand intercultural understanding are more likely to be satisfied with host university academic experiences related to the globally oriented curriculum and interact frequently with diverse students; these together positively affect the development of global citizenship. In other words, study abroad as a high-impact practice that is effective in cultivating global citizenship is applicable to international programming in higher education institutions across different regional contexts.

Keywords: global citizenship, regional student mobility, structural equation model, ASEAN, South Korea

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Introduction

In the past decade, programs promoting regional student mobility have continued to grow, especially among Asian countries, as a basis to form close political and economic ties between countries. For example, higher education cooperation among ASEAN Plus Three countries has been strengthened since 2010, clearly exemplified by the implementation of government-initiated multilateral student mobility programs (e.g., the AIMS program, CAMPUS Asia) and the development of official communication channels on quality assurance and student mobility among ASEAN+3 countries. In other words, there has been a growth in study abroad programs designed not only to guide students toward becoming engaged global citizens (e.g., Brown, 2006; Marais & Ogden, 2011) but also to develop a "we-feeling" among ASEAN+3 countries from the grassroots level via education and cultural exchange programs.

Such growth in student mobility programs in the ASEAN+3 region has naturally raised the need for empirical evidence about the effectiveness of study abroad participation on student outcomes. In other words, research demonstrating the positive effects of study abroad participation has become an important means to sustain government-funded study abroad initiatives. However, most prior studies have been based on North American or European higher education institutions, with limited studies conducted in other regions such as Southeast or East Asia.

Prior research and anecdotal evidence highlight the importance of taking into account unique cultural contexts and circumstances around international programs in understanding the effects of study abroad experiences. To demonstrate this fact, a number of studies convey substantial differences between Eastern and Western country perspectives in terms of philosophical orientations (e.g., collectivism vs. individualism) and cultural differences (e.g., high context vs. low context) (e.g., Goh, 2021; Kim & Jun, 2018; Kwon et al., 2013). Nisbett & Masuda (2003) underscores that such differences in perspectives lead to cultural differences in thinking and learning. What is more, anecdotal evidence from international educators at universities in Korea and ASEAN countries, for example, indicate that for many students, the most popular study abroad destinations continue to be in Western, English-speaking countries such as the United States or the United Kingdom, and as a result, choosing an Asian country for a study abroad destination involves other reasons to a such as the availability of scholarships or academic major requirements (e.g., a regional studies major). As such, a closer look at study abroad experiences and learning in the Asian region is needed to understand whether research findings and best practices largely developed based on Western experiences are applicable to study abroad experiences in Asian countries.

In addition, many student mobility programs implemented among Korea and ASEAN countries reflect goals to develop global citizenship. A substantial body of research has been devoted to demonstrating the effectiveness of study abroad experiences, especially as regard to the development of global citizenship (e.g., Horn et al., 2012; Linder & McGaha, 2013).

However, given the fact that global citizenship is conceptualized in various ways and rarely operationally defined due to limited instruments available to measure the complex construct, scholars note inconsistencies in research findings (Morais & Ogden, 2011).

Hence, the purpose of this study is to investigate student experiences in international exchange programs in ASEAN countries (i.e., Indonesia, Malaysia, Thailand, Vietnam) and Korea to build and expand upon prior study-abroad research conducted mostly in North American or European contexts. We focus attention on how student characteristics are mediated by program experiences abroad that contribute to global citizenship outcomes.

More specifically, we examine the following research questions:
(1) Do student background characteristics directly influence students' self-reported reasons for intercultural learning?
(2) Does student plan for intercultural learning directly influence global citizenship and academic program experiences in the host country?
(3) Does student satisfaction with global academic curriculum and frequency of interactions with students at the host university directly influence the development of global citizenship?
(4) To what extent do study abroad program experiences mediate the impact of students' reasons for intercultural learning on their development of global citizenship?

Research context: Student mobility in the ASEAN+3 region

ASEAN, a regional block comprising ten South Asian countries including Indonesia, Malaysia, Thailand, and Vietnam, was established in 1967 to promote economic development, technology, and competitive advantage in the region (Syahruddin et. al., 2016). ASEAN is rapidly growing, with a population of more than 620 million, and it embraces different cultures, religions, languages, and educational systems (ASEAN, n.d.). In particular, with a government-level commitment to the internationalization of higher education, almost all countries in the region have high levels of openness and mobility that contribute to the development of the "we-feeling" among different people (Atherton et al., 2019). Among the +3 countries, China and Japan have been actively promoting various forms of cooperation among higher education institutions to increase student mobility; more recently, South Korea also joined efforts to expand international cooperation between Korean and ASEAN universities. While a majority of international students in Korea still come from China (44.2%), over the past decade, the number of students from ASEAN countries (29.4%), particularly from Vietnam, is drastically on the rise.

In addition to the increase in the number of exchange students from ASEAN countries, it is notable to see growth in government-initiated regional student exchange programs (e.g., CAMPUS-Asia, AIMS; Asian International Mobility for Students). In particular, the AIMS

program, led by SEAMEO RIHED, is a good example of a growing regional student mobility program. It was first implemented in 2011 to promote the mobility of college students to cultivate globalized human resources for all SEAMEO member countries as well as partner countries outside of the region (Shaik-Abdullah et al., 2020). This program was subsequently broadened to include other neighboring regions such as Japan (2013) and Korea (2016).

The AIMS program is distinct from other student exchange programs set up through bilateral exchange agreements between universities because the ministry of education (or equivalent ministries in respective countries) nominates and endorses member universities. The primary goal of the program is the internationalization of higher education in the Southeast region and beyond and to nurture regional identity and connectivity to build a more integrated community across diverse countries and cultures in the region. Hence, a group of government representatives for each member country (AIMS Steering Committee, n.d.) came together to establish a platform for a student mobility program, and it continues to operate under the oversight of the steering committee. As of October 2022, 80 universities in seven ASEAN countries (i.e., Brunei Darussalam, Indonesia, Malaysia, Philippines, Singapore, Thailand, Vietnam) and two Northeast Asian countries (Korea, Japan) participate in the program.

Our research mostly focused on universities that participated in the AIMS program; results show that over one third of the respondents (35.5%) have studied abroad through funding by the AIMS program. Therefore, it is important to highlight the fact that this study examines study abroad experiences and outcomes of government-initiated and funded regional international programs, providing additional insights into current research mostly based on university-led student mobility programs. What is more, the region-specific context of this study also reflects a period and geographical area at which universities in the countries were advancing internationalization. Expanding student mobility, in particular, was part of the larger institutional, national, and supra-national movement toward cultural, economic, and political interconnections among countries in the region.

Literature review

In the literature review that follows, we highlight key findings that support our conceptual model tested in the study (Figure 1). In particular, we examine how students' reasons to engage in intercultural learning abroad are influenced by personal factors, how these characteristics shape satisfaction with and engagement in program experiences abroad, and concomitantly how program experiences facilitate the development of global citizenship.
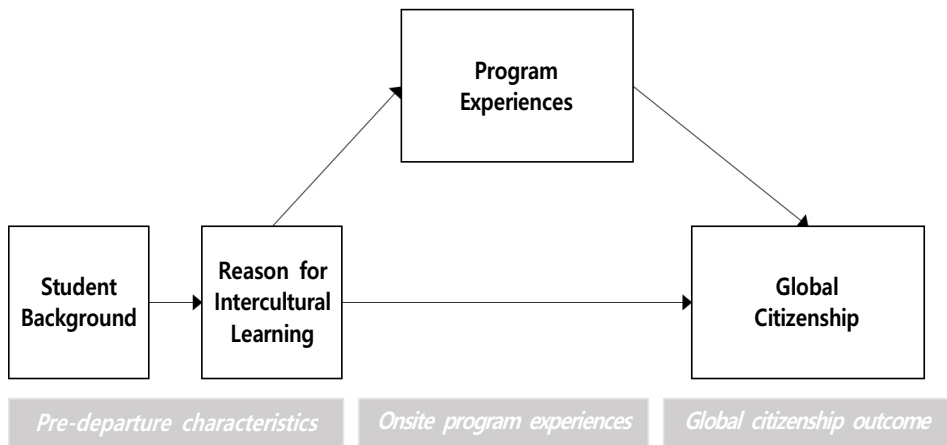
Figure 1 Conceptual framework

Development of global citizenship through study abroad participation

Development of global citizenship is one of many outcomes of interest in study abroad research (e.g., Lutterman-Aguilar & Gingerich, 2002; Tarrant et al., 2014). Nonetheless, it is conceptualized in various ways with different constitutive attributes and emphases (Deardorff, 2009). Several authors within the field of international education (e.g., Morais & Ogden, 2011; Van Gent et al., 2013; Cho, 2017; Moon 2013) suggest that the array of desired outcomes that relates to the development of global citizenship clusters along three theoretical dimensions: social responsibility, global competence, and global civic engagement.

The social responsibility dimension represents an understanding of interdependence and social concern to others and to society and the environment. Arrayed along this dimension are attributes such as respect for diverse perspectives, the ability to evaluate social issues and identify instances of global injustice and disparity, and one's capacity for understanding the interconnectedness between local behaviors and their global consequences (e.g., Braskamp et al., 2009; Lagos, 2001). Global competence refers to having an open mind and the skills/knowledge to engage successfully in intercultural encounters (e.g., Deardorff, 2006). For example, globally competent students display interactional dispositions and skills that enable them to adapt to various cultural settings such as working in different cultural contexts with people whose perspectives differ from one's own and relating to people from other cultures (e.g., Deardorff, 2006; Soria & Troisi, 2014; Sutton & Rubin, 2004). Global civic engagement captures one's predisposition toward recognizing local, national, and global community issues and responding through actions such as volunteerism (e.g., Paige et al., 2008). In other words, global civic engagement includes an action dimension indicating an

individual's altering of personal habits and active engagement in purposeful local behaviors that advance a global agenda (e.g., Lagos, 2001).

However, such constructs of global citizenship have been developed and tested mostly in North American or European contexts. Studies on global citizenship development in Asian countries are limited, particularly among college students. For instance, Hirata (2016) conducted a comparative study in Thailand and Japan to examine citizenship education at the local, national, and global levels, but research participants were elementary and secondary school students. Nonetheless, results of this Delphi study indicate that characteristics of citizenship at the global level closely align with the three dimensions of global citizenship identified by Morais and Ogden (2011).

The development of global citizenship is a goal many study abroad programs share in order to empower students and to prepare them to become responsible global citizens. Prior studies and best practices literature lend support for study abroad programs serving as effective means for the development of global citizenship (e.g., Horn & Fry, 2013; Linder & McGaha, 2013). Nevertheless, researchers and international educators have also noted that global citizenship development in study abroad programs requires time and opportunities for refinement; namely, efforts to use the international experience intentionally are needed as a basis for global citizenship building (Lutterman-Aguilar & Gingerich, 2002; Paige & Vande Berg, 2012). To demonstrate this fact, studies have found that formal curricula that incorporate diverse perspectives and culturally relevant materials in the classroom contribute to achieving developmental outcomes (e.g., Ellwood, 2011; Smith & Moreno-Lopez, 2012). Massaro (2022), based on a systematic review, concludes that the integration of global citizenship in coursework serves as an effective means to nurture global citizenship.

Numerous studies have also shown the importance of students' opportunities to interact with diverse members of the host community and the amount of time spent with local and other study abroad participants on producing outcomes related to the development of a global perspective (e.g., Jones et al., 2012; Knight & Schmidt-Rinehart, 2010). Allport's contact theory (1954) is frequently used to explain why structured interactions with individuals in the host country (e.g., focused conversations and interviews facilitated by program leaders) lead to changes in learners' self-understanding and attitudes toward those who are culturally different (Salisbury et al., 2013; Vande Berg et al., 2009). A key assumption is that meaningful interactions, emphasizing cooperation and equal status among participants, tend to disrupt stereotypes and facilitate reappraisals of self and outgroup members. Hence, the intentional design and facilitation of various activities inside and outside of the classroom that promote interactions among students from different races, ethnicities, and social class groups can potentially create conditions that enhance the development of global and intercultural competencies (Soria & Troisi, 2014). Spero (2022), based on a qualitative study in Japanese colleges and universities, highlights the important role of such interactions with peers, especially from other countries, in the formation of global citizenship identity.

Student characteristics and engagement in study abroad program experiences

Researchers have identified an extensive list of student attitudes, affective traits, and behaviors that influence their intentions to study abroad (e.g., Goldstein & Kim, 2006; Kim & Lawrence, 2021; Luo & Jamieson-Drake, 2015; Salisbury et al., 2009). In particular, goals or reasons for intercultural learning have been conceptualized as an important component in understanding international mobility patterns. For example, Stroud (2010) found that students who placed more importance on understanding other countries and cultures were more likely to plan to study abroad than were those who reported that cultural understanding was not as important.

Nevertheless, students' motivations and goals for intercultural learning in study abroad programs are likely related to various sources of human, economic, social, and cultural capital. In other words, personal factors such as gender, socioeconomic status, and financial support influence student attitudes toward study abroad and intercultural learning. For example, students with well-educated parents who come from higher income homes and attend better secondary schools may have cultural capital at entry (e.g., prior international experience) that predisposes them for awareness of and interest in other cultures. In addition, Salisbury et al. (2010) state that "gendered differences play an important and varied role in shaping the ways that men and women develop interests in participating in study abroad programs" (p. 632). Studies also consistently find perceived constraints due to lack of finances to be negatively associated with plans to study abroad (e.g., Dessoff, 2006; Van Der Meid, 2003). Hence, the availability of financial resources for international experiences such as scholarships or financial aid potentially plays an important role in the development of interest in study abroad.

Contrary to a sizable body of research on factors that shape students' plans to study abroad, only a limited number of studies have examined whether students' reasons for attending study abroad programs contribute to their satisfaction with and engagement in program experiences abroad and to the enhancement of global and intercultural outcomes (Kitsantas, 2004). Studies of students' motivated cognitive strategies (e.g., Pintrich, 2000, 2003) indicate that their personal goals for a given course and the evaluation of goals established by the teacher affect their learning behaviors that, in turn, shape their learning outcomes. In other words, motivation can be understood as attempts to achieve goals, and hence, an individual's goal setting significantly enhances his or her performance and intrinsic interest in a given task (Zimmerman & Kitsantas, 1999). In the context of study abroad, each individual's goal setting that specifically relates to intercultural learning may serve as an effective motivator that enhances their satisfaction with and engagement in study abroad program experiences and positively shape global citizenship outcomes.

Together, our conceptual framework (Figure 1) builds on these studies to explicate the relationship between student characteristics, program experiences, and global citizenship learning. It assumes that the development of global citizenship is affected by student

characteristics prior to studying abroad as well as satisfaction with student academic experiences along with engagement with students during international exchange programs. Consequently, it is reasonable to expect that individuals may bring different prior experiences and perspectives to the program, invest themselves in different ways, and realize different outcomes.

Data and methods

Data sources

We used survey data collected from 806 current ASEAN/Korean students and graduates who participated in credit-issuing international exchange programs offered by 47 universities in four ASEAN countries (Indonesia, Malaysia, Thailand, Vietnam) and Korea since 2017. Indonesia, Malaysia, and Thailand were selected because these were the three countries in which the AIMS program was implemented and that have most actively participated in the program over the years (AIMS, n.d.). We included Vietnam in the study because of the recent increase in student mobility between Vietnam and Korea. As indicated earlier, most universities in the study participated in the AIMS program, and, as a result, over one third of the respondents (35.5%) received AIMS scholarships. While all countries are non-English speaking countries, AIMS participant universities developed interdisciplinary courses that were offered in English that reflected AIMS program objectives to nurture global citizenship and a regional identity and connectivity in Southeast Asia and beyond.

The study utilizes data gathered from student surveys collected online from June 10 to July 28, 2020, using SurveyMonkey. The survey instrument was developed by the research team to measure the development of global citizenship, career readiness, country image, and academic outcomes among students who engaged in international exchange programs in the four ASEAN countries and Korea. In particular, survey items pertaining to global citizenship measures were extensively revised and validated in the Asian context, especially through close collaboration among our research team, which consisted of researchers from the five countries, to confirm that the survey items were applicable to each country context. The survey also gathered information about student background characteristics, including reasons or motivation to participate, satisfaction with academic and campus experiences at the host university, and frequency and nature of interactions while abroad.

Measures

To examine the mediating role of host university program experiences, we used a single latent construct of global citizenship as our outcome variable. Global citizenship, captured by the mean score of *social responsibility, global competence, and civic engagement* scales (see

Appendix A) following Morais and Ogden's global citizenship framework (2011), represented an endogenous latent construct in the structural models. In addition, we included one academic program experience (endogenous) variable in the structural model capturing respondents' level of satisfaction with an academic curriculum that integrated global issues at the host university. We also examined the nature and frequency of relationships with different groups of students at the host university (endogenous). Finally, we examined one additional latent construct of student reasons to participate in the international program in the structural models (reason for intercultural learning; exogenous). We also included three exogenous, observed variables that captured student characteristics that are known to be associated with each student's reasons for intercultural learning (i.e., gender, socioeconomic status, scholarship availability).

Analyses

We used structural equation modeling (SEM) to evaluate our model and to determine the mediating role of host university program experiences in connecting student characteristics prior to studying abroad to global citizenship outcomes. SEM assesses the degree to which patterns of variance and covariance in the data support a model by estimating the magnitude and statistical significance of direct and indirect paths between measures of the theoretical constructs (Kline, 2005). We investigated mediation effects by testing the statistical significance of total, direct, and indirect effects of measures (Kohler et al., 2011). We considered several measures of fit to determine the relative efficiency of our estimates: the comparative fit index (CFI), root mean square error of approximation (RMSEA), and Tucker-Lewis index (TLI). Current standards suggest that a good fitting model is associated with CFI and TLI values above 0.95 and RMSEA values below 0.08 (Kline, 2005).

Results

Table 1 presents the results of the structural equation model, and Figure 2 shows a graphical representation of the direct effects in the model. Collectively, the fit statistics of the specified model are acceptable. The RMSEA is 0.066 with a 90 percent confidence interval between 0.057 and 0.074. The CFI and TLI indices are 0.929 and 0.896, which are below the good fitting demarcation but indicate a moderate fit.

Table 1 Standardized coefficients for the direct effects in the structural equation model

	Motivation for intercultural learning	Curriculum: Global issues	Student interaction: Local	Student interaction: Home country	Student interaction: Other intl	Global citizenship
Gender (1 = Men)	-0.176***					
	(0.035)					
Socioeconomic status	-0.253***					
	(0.010)					
Received scholarship (1 = Yes)	0.348***					
	(0.037)					
Reason for intercultural learning		0.225***	0.370***	0.426***	0.237***	0.711***
		(0.086)	(0.099)	(0.120)	(0.109)	(0.073)
Curriculum integrating global issues						0.148***
						(0.018)
Student interaction: Local						0.074*
						(0.018)
Student interaction: Home country						-0.000
						(0.015)
Student interaction: Other intl						0.114***
						(0.014)

Notes. Cells with no entry are not part of the path model. Standard errors in parentheses.
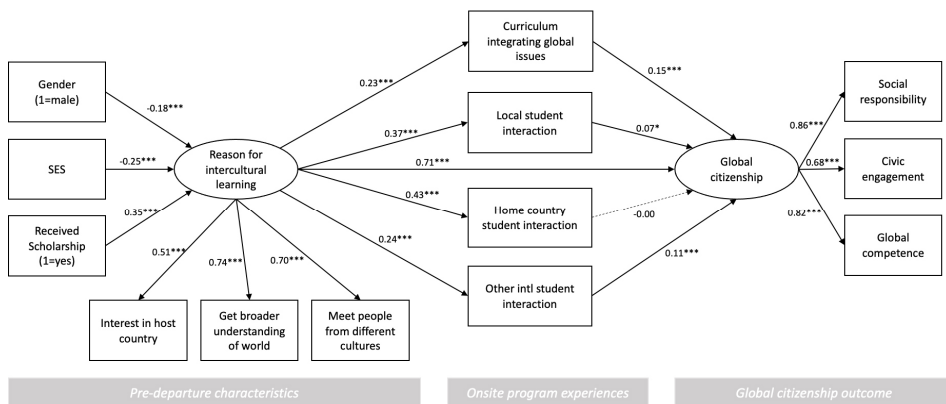
* $p < .05$; ** $p < .01$; *** $p < .001$

Figure 2 Summary of standardized path coefficients for the full structural model

Note. CFI = 0.929, TLI = 0.896 and RMSEA=0.066. Significant levels are indicated by the following: *$p < .05$, **$p < .01$, ***$p < .001$. Insignificant paths are indicated with dashed line. Covariances, error terms, and disturbances are not shown in the model.

As predicted, we found a highly significant direct effect ($p < .001$) of a global academic curriculum on students' development of global citizenship. We also uncovered significant direct effects on the global citizenship construct in relation to two of the student interaction variables. More specifically, individuals who frequently interacted with local students ($\beta = 0.074$) and other international students ($\beta = 0.114$) at the host university report higher scores in global citizenship. Frequent interactions with home country students, on the other hand, is not significantly associated with the global citizenship outcome.

Our results (see Table 2) convey that students' experiences with internationally oriented curricula significantly and positively mediate the effect of students' reasons for intercultural learning prior to study abroad (indirect effect = 0.033) on the development of global citizenship. Student interactions with local students and other international students during their study at the host university also positively mediate the effect of students' reasons for intercultural learning on global citizenship (indirect effects = 0.028 and 0.027, respectively). Frequent interactions with students from the home country, on the other hand, exert no indirect influence on global citizenship through reasons for intercultural learning.

Collectively, students who report a strong interest in expanding their intercultural understanding are more likely to be satisfied with host university academic experiences related to the globally oriented curriculum and interact frequently with diverse students; together, these positively affect the development of global citizenship. Nevertheless, given the fact that our results also show a direct and significant relationship between an individual's reasons for intercultural learning and global citizenship, program experiences partially, rather than fully, mediate the relationship between individual reasons for intercultural learning and the development of global citizenship.

Table 2 Total, direct, and indirect effects of motivation for intercultural learning and indirect effects of program experience variables on global citizenship

	Direct effect	Indirect effect	Total effect
Reason for intercultural learning	0.711***	0.088***	0.799***
Curriculum integrating global issues		0.033***	
Student interaction: Local		0.028*	
Student interaction: Home country		0.000	
Student interaction: Other international		0.027***	

* $p < .05$; ** $p < .01$; *** $p < .001$

Discussion

Study findings confirm the interconnections among factors that facilitate or impede the development of global citizenship in study abroad programs implemented in ASEAN and

Korean universities that prior investigators have suggested. Consistent with prior research and best practices literature (e.g., Ellwood, 2011; Smith & Moreno-Lopez, 2012), we found a high level of satisfaction with curricular experiences integrating global issues and frequent interactions with local and other international students to effectively promote the development of global citizenship. Our results support prior notions that institutional efforts to incorporate international perspectives into the formal curriculum are essential not only for meeting student expectations for study abroad programs but also to promote the development of global citizenship. The AIMS program, for example, provides clear objectives for integrating global citizenship learning and regional identity development in program manuals that are used by member colleges and universities to design and implement courses. A closer examination of different pedagogical approaches used to develop such globally oriented curricula would help further identify the key components associated with global citizenship building.

Researchers highlight the importance of meaningful interactions with diverse members of the host country in enhancing global and intercultural outcomes (e.g., Allport, 1954; Jones et al., 2012; Soria & Troisi, 2014). Our findings support this proposition, with students who report frequent interactions with local and other international students in the host university program showing higher scores in global citizenship development. Nevertheless, interactions with students from the home country do not predict global citizenship, which poses questions as to reasons why interactions with certain student groups promote global citizenship learning while interactions with others do not. We conjecture that one reason may be due to variations in the quality of student interactions and the context in which those interactions take place. Contact theory, for instance, underscores the importance of having structured interactions that emphasize cooperation and equal status among peers that effectively disrupt stereotypes and lead to changes in one's self-understanding and perspectives toward people from other cultures (Allport, 1954). In other words, the key to producing intercultural outcomes is not merely having opportunities to interact with diverse people but rather the quality of such interactions. Hence, in the current study, it might have been the case that the quality of interactions differed among student groups. It is also possible that some types of interactions took place in the context of intentionally designed curricular or co-curricular activities while others did not.

In line with prior study findings, we also found that student background characteristics exert significant influences on reasons to engage in international experiences. For example, researchers note the persistent differences in study abroad intentions between men and women and suggest that men may be less inclined to engage in international experiences because of their majors and a low interest in language learning (e.g., Kim & Lawrence, 2021; Luo & Jamieson-Drake, 2015). Our results indicate that, among those who participate, men (compared to women) perceive the expansion of intercultural understanding to be less important in their reasons to participate in study abroad programs. While this finding provides a more nuanced perspective on potential differences among men and women in

their motivations to engage in international experiences, future research should further examine why we see gender differences in goals and motivations and the potential impact of such differences on study abroad experiences and outcomes. More specifically, taking into account other goals or reasons to participate in study abroad such as language training or career development will help identify goals that differentially push or pull men and women to engage in international experiences.

Contrary to prior findings showing that students from high socioeconomic backgrounds are more likely to exhibit an interest in other cultures (e.g., Doyle et al., 2010), our results indicate that reports from participants from higher income families indicate a lower importance for expanding cultural understanding in their decisions to participate in study abroad compared to those from lower income families. We conjecture that this may be due to the higher income group having the resources and capital to engage in other international experiences prior to study abroad participation, which would predispose them to having high levels of understanding and interest in other cultures. In other words, students coming from families with a high socioeconomic level may have other goals they want to attain through the study abroad program, as they may already have engaged in multiple experiences of studying, traveling, or living in a foreign country.

Nevertheless, it is important to note that, within the context of this study, students' choice of study abroad destination may be associated with their socioeconomic status. More specifically, anecdotal evidence from study abroad administrators working at ASEAN and Korean universities indicate that those who are from high-income families are more likely to report that the United States or European countries are their first-choice study abroad destinations. This is in part reflected by the average socioeconomic status indicator for the sample, being 6.6 out of 10 points. More participants in the sample are from middle- rather than high-income families and, as such, factors that impact their decisions to participate in study abroad may differ from those of high SES students. It is also worth noting that about half of the students in the sample have received a scholarship and that a substantial number of them have participated in the AIMS scholarship program. Hence, selection criteria for the AIMS program might have affected not only the SES distribution of students (i.e., more student participants were from lower-income families who need financial assistance) but also students' reasons to participate in study abroad programs in some countries. Together, further research is needed to understand students' choice of study abroad destination countries and their characteristics and perceptions associated with these preferences to better inform efforts to recruit students for regional student mobility programs.

It has been widely reported that financial constraints shape student plans to study abroad (e.g., Dessoff, 2006; Van Der Meid, 2003; Whatley, 2017). As such, prior findings delineate important effects of the availability of scholarships or financial aid (e.g., Twombly et al., 2012) on study abroad decisions. In line with prior research, we also discovered that students who received scholarships reported a higher importance for intercultural learning compared to those who did not receive scholarships. On the one hand, this may be due to students

with a high interest in cultural understanding being more proactive in seeking information and pursuing scholarship opportunities for study abroad. On the other hand, this finding could also be interpreted as indicative of the presence of scholarship programs that are designed to nurture student interest in other cultures effectively. This finding raises questions for further research on the nature of scholarship programs and how they can contribute to formulating interest and goals in study abroad. For example, scholarship programs such as the AIMS program are designed to promote student mobility among ASEAN countries to increase understanding of the region and therefore, specify clear learning goals and programs for participants.

Last, findings from the current study underscore the fact that study abroad research and best practices literature largely based on North America and Europe are also applicable to the Southeast Asian region, and Korea in particular, in terms of identifying effective instructional practices to promote intercultural learning. In other words, study abroad as a high-impact practice that is particularly effective in cultivating student learning appears to be relevant to international programming in higher education institutions across different regional contexts.

Conclusion and implications

Our results based on students who have participated in international exchange programs at ASEAN and Korean universities show that background characteristics significantly influence such students' reasons for intercultural learning and this, in turn, exerts strong effects on student experiences at the host university. Our proposition that onsite experiences abroad influence global citizenship learning is supported by our findings; three of the four onsite program experiences (i.e., satisfaction with globally oriented academic curriculum, student interactions with local and other international students) included in the model exerted significant direct effects on the development of global citizenship. Finally, study abroad program experiences only partially, rather than fully, mediated the relationship between individual reasons for intercultural learning and global citizenship development. Together, our results provide preliminary support for the theoretical construct we proposed and in particular highlight the importance of taking students' reasons to participate in study abroad into account as they shape student experiences abroad and outcomes.

In addition, our research as well as previous studies suggest three implications for practice. First, in developing courses and programs for study abroad, international educators/instructors should strongly and clearly incorporate global issues into program content in order to help students understand the interdependence of countries and to learn what it means to become a global citizen. It is important to note that different pedagogical approaches can be taken to realize this goal; for example, an engineering course organized around global issues will take a very different form from a history course integrating global

perspectives. Second, results show that students learn and develop global citizenship through peer interactions. Building upon this finding, the provision of structured opportunities for students to form meaningful relationships with different groups of students appears to be essential in maximizing global citizenship learning. Examples of structured opportunities include, but are not limited to, class discussions among a diverse group of students facilitated by faculty or reflection exercises to debrief participants' experiences. Third, students who are strongly motivated to expand global/intercultural understanding are more likely to be more proactive in their learning in the host university, reaping higher gains in global citizenship outcomes. Hence, if the primary goal of study abroad offices is to maximize student learning abroad, then an effective strategy would be to recruit students who exhibit high interest in cultural learning. Nonetheless, in light of our findings that student characteristics (e.g., gender, SES, financial support) shape students' reasons for engaging in intercultural learning, it is likely that students who have limited resources for international experiences are less likely to develop interests in other cultures and to study abroad. As such, efforts to publicize study abroad initiatives by designing and implementing campuswide activities inside or outside the classroom may be effective means to expand study abroad opportunities to students of all backgrounds and to nurture interests in intercultural and global citizenship learning.

Limitations

Several limitations of this study should be acknowledged. First, we relied on a post-test-only design, which may limit the accurate assessment of change in global citizenship outcomes. Second, our survey instrument, similar to other study abroad assessment instruments used in prior research (e.g., Global Perspective Inventory), relies on students' self-reported responses to gauge different aspects of global citizenship development. Apart from the fact that students do not all respond the same way to the same activity, they may report what they believe other people expect to see, which are inherent limitations of all self-reported surveys (Paulhus, 1991). Third, we recognize that the participating students in this study are not representative of all students who study abroad; therefore, the findings cannot be generalized across all college students who participate in international exchange programs in ASEAN countries or in Korea. Finally, in our model, we included personal and program factors that are expected to exert an influence on the global citizenship outcome. Nevertheless, we acknowledge that there may be other personal factors and curricular/cocurricular experiences that are not captured in this study due to data constraints. Despite these limitations, we believe that the results of this study will form the basis of additional studies that examine the relationships among student characteristics, program engagement, and global citizenship outcomes in international mobility programs, especially in the Southeast and East Asian region.

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Appendices

Appendix A. Variable definitions

	Definitions
Global citizenship (Outcome variable)	
Social responsibility (Cronbach's Alpha = .83)	*An eight-item measure reflects respondents' extent of agreement with self-reported change in the following items:* (1) I am aware that my actions in my home country may affect people in other countries. (2) I have a strong interest in political and social issues in other countries. (3) Being actively involved in global issues is my responsibility. (4) I understand well that we are living in an interdependent world. (5) Basic services such as health care, clean water, food, and legal assistance should be available to everyone, regardless of what country they live in. (6) I think that discriminating people by social status is wrong. (7) I am concerned with respecting the rights of all people, globally. (8) No one country or group of people should dominate and exploit others in the world.
Global competence (Cronbach's Alpha = .86)	*A ten-item measure reflects respondents' extent of agreement with self-reported change in the following items:* (1) I am able to share my opinions online over global issues. (2) I am able to get other people to care about global issues that concern me. (3) I feel comfortable expressing my views regarding urgent global issues in front of a group of people. (4) I am informed of current issues that impact international relationships. (5) I can discuss cultural differences based on reliable information. (6) I understand and respect values of people from different cultural backgrounds. (7) I think there are a lot of things to learn from other cultures. (8) I am able to work cooperatively with people from different cultures. (9) I am able to mediate interactions between people of different cultures by helping them understand each other's values and practices. (10) I often adapt my communication style to other people's cultural background.
Civic engagement (Cronbach's Alpha = .88)	*A nine-item measure reflects respondents' extent of agreement with self-reported change in the following items:* (1) I will volunteer my time working to help Individuals/communities home or abroad. (2) I plan to get involved with a global humanitarian organization or project. (3) I plan to get involved in an effort to address the global environmental crisis. (4) I plan to help people in different countries who are in difficulty. (5) I will deliberately buy brands and products that can help marginalized people and places. (6) If possible, I will buy fair-trade or locally grown products and brands. (7) I will express my concerns to others about global environmental, social, or political problems. (8) I will participate in a campus forum, live music, or theater performance or other event where young people express their views about global problems. (9) I will display and/or wear badges/stickers/signs that promote a more just and equitable world.

Student characteristics (Independent and control variables)	
Reason for intercultural learning:	
Interest in host country	1 = Not important to 5 = Very important
Get a broad understanding of the world	1 = Not important to 5 = Very important
	1 = Not important to 5 = Very important
To meet people from different cultures	
Gender	0 = Women; 1 = Men
Socioeconomic status	10-point slider from 1 = Poor/No education/Low paying job to 10 = Rich/Highly educated/High paying job
Received scholarship	0 = No; 1 = Yes
Program satisfaction and frequency of interactions (Mediating variables)	
Academic curriculum that integrated global issues	*Satisfaction level on educational experiences at host university:* 1 = Not satisfied at all to 5 = Very satisfied
Frequency of interactions: Local students	*"During your participation, to what extent have you interacted with:* 1 = Not at all to 5 = Always
Students from home country	1 = Not at all to 5 = Always
Other international students	1 = Not at all to 5 = Always

Appendix B. Descriptive statistics

	Obs[a]	*Mean*	*SD*	Min	Max
Global citizenship					
Social responsibility scale	766	4.093	0.543	1	5
Global competence scale	766	3.979	0.516	1	5
Civic engagement scale	766	3.907	0.609	1	5
Reason for intercultural learning					
Interest in host country	791	3.901	0.827	1	5
Get broader understanding of the world	791	4.332	0.753	1	5
To meet people from different cultures	791	4.460	0.740	1	5
Academic satisfaction					
Curriculum that integrated global issues	766	3.918	0.827	1	5
Extent of Interactions with Students in Host University					
Interaction: local students	780	3.940	0.894	1	5
Interaction: home country students	780	4.050	1.049	1	5
Interaction: other international students	780	3.765	1.051	1	5
Student background characteristics					
Gender (1=Men)	734	0.341	0.474	0	1
Socioeconomic Status	734	6.556	1.758	1	10
Received scholarship (1=Yes)	806	0.557	0.497	0	1

[a] ASEAN and Korean participants constituted 64% and 36% of the sample, respectively.

Determining the changes needed to improve classroom assessment: An analysis of secondary schools in Pakistan

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Abstract

This study aimed to determine the changes needed to improve classroom assessment at the secondary level in Pakistan. The instruments used in this mixed-method study included a research questionnaire, interview, and qualitative classroom observation. The study concluded that major changes needed to improve classroom assessment included the usage of a variety of assessment techniques, reduced workload of teachers, provision of special guidelines to weak students, and provision of professional training and proper assessment materials to teachers. It is recommended that the administration of Federal Government Educational Institutions (FGIEs) should arrange continuous professional training for teachers on classroom assessment. The provision of proper assessment materials should also be ensured. School principals should play an effective role in providing guidelines to faculty members.

Keywords: Changes, classroom assessment, secondary school, mixed-method, Pakistan

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Introduction

Assessment is a method that involves the collection and analysis of data related to objects or people (Reynolds et al., 2016). It has been used in many countries of the world since a long time ago. In China, the concept of assessment was well believed during the period of Sui dynasty (606 B.C). The individuals for government service were selected through a systematic process of national assessment (Esther, 2006).

In educational assessment, students are evaluated for their capabilities, knowledge, and understanding (Marriott & Lau, 2015). Measuring the learning progress of students is an important part of teaching and educational reform (Bagnato & Ho, 2006). It enjoys significant importance in the teaching-learning process (Dhindsa et al., 2016). Classroom assessment is a type of assessment in which teachers are directly involved and assess the performance of students around the session. It is directly connected to the learning achievement of students (Dixon & Haigh, 2011). The quality of the teaching-learning process and the achievement of students is enhanced by using effective classroom assessment (Allen & Fraser, 2015; Elkatms, 2016). To ensure the quality of classroom assessment, teachers must learn the latest techniques and hold updated knowledge regarding student assessment (Nitko, 2010). Classroom assessment is mainly related to the teachers who are responsible for informing the assessor about their instructional decision-making and students' learning (Zhao et al., 2016). It has remained a subject of debate for comparing the functions of formative and summative assessment since 1970, but later on, the concept of formative assessment became important as it enhanced the achievement of students (Tan & Towndrow, 2009). There exists a difference in opinion on the Meaning of formative assessment, but it helps make decisions about student learning and evaluate their improvement in learning (Wiliam & Leahy, 2015). Both types of assessment are interrelated and work parallel with each other as teachers use their combination in classes (Harlen, 2009; Leong et al., 2014).

Improving student academic achievement has been a significant factor in the whole teaching-learning process, and teachers have been focusing on it worldwide. It has been given importance in developed countries during the 18th century. Teachers have been using modern techniques for the assessment of their students since that time (Marzano, 2016). During the 1850s, the authorities of education and instruction in Massachusetts State, USA used paper examinations to assess the academic achievement of students. School authorities were held responsible and answerable for the progress of student learning achievement (Miller et al., 2015).

Different opinions of teachers can be seen on how to conduct the process of assessment. Some believe that it is better to use traditional techniques to assess student performance. Essay type and multiple-choice items are included in such techniques. They advocate that these techniques help them to measure the learning achievement of the students when the syllabus is lengthy. Using these techniques, knowledge, understanding, and application can be judged appropriately. Other teachers advocate for modern techniques of assessment. They

are of the view that creativity among the students cannot be judged using traditional techniques of assessment. For this purpose, they suggest that student portfolios, self-writings, essays, and peer-assessment should be used. In this way, the opinions of the teachers vary between traditional and modern assessments (McMillan, 2018). These capabilities cannot be measured using traditional assessment (Reynolds et al., 2016).

Depending upon the purpose of the assessment, teachers adopt different assessment techniques. The following types of assessments are mainly used by teachers in many countries (UNESCO, 2000).

School-based assessments are conducted at the institutional level. Teachers and other instructional staff are normally considered to be responsible for conducting such assessments. These assessments are held on a short-term basis and the results are quickly available to the stakeholders. Public examinations are conducted at the end of secondary education. These assessments allow the students to get admission to higher education institutes. The performance of teachers in secondary schools is also judged using the results of these examinations. A public examination body normally conducts these assessments. National assessments are used to evaluate the educational system of a country. A whole population or a selected sample is allowed to appear in these assessments and the results thus obtained are used by policymakers. International assessments help compare the performance of students of different countries of the world on certain educational issues and are conducted on an international basis by OECD, UNICEF, UNESCO, and IEA. Examples of these tests include, but are not limited to, TIMSS, PIRLS, PISA, MLA, etc.

The process of classroom assessment is a systematic manner to help teachers in formative evaluation. It indicates the quality and quantity of learning of the students. Moreover, it plays a significant role in improving quality of learning in the classroom (Angelo & Cross, 1993). In this way, classroom assessment involves formative assessment but it prepares the students to perform actively and efficiently in public, national and international assessments.

Many researchers have explored that teachers do not feel positive about classroom assessment (Black et al., 2004). Teachers viewed that conducting classroom assessment hinders the normal teaching-learning process too. In an environment where superficial and rote learning is encouraged at all levels, it is very difficult to talk about creative skills. Teachers, students, and parents usually focus on grades. The attitude of teachers around grading causes students to have lowered self-esteem to feel demoralized. All of these factors create a lack of interest in classroom assessment (Black, 1998). Teachers lack proper skills and knowledge in assessment. A clear majority of novice teachers do not have basic knowledge regarding the assessment of students. Teachers do not discuss and review their teaching strategies and assessment techniques for their accountability (DeLuca & Johnson, 2017). The short duration of the subject period hinders the conduct of effective classroom assessment. An excessive number of students in a class cause difficulty in marking essay-type questions (Webb, 2010). Teachers have to face political or external pressures during the conduct of student assessments. The complex structure of society also creates a hurdle. The phenomenon of

globalization is affecting the process of student assessment, in one way or the other. Moreover, current practices in student assessment are not supporting students in knowledge comprehension, practical application, and expression of skills (Kotze, 2015). As the assessment process increases the workload of teachers and students, so they do not feel at ease with it. Teachers are also of the view that it overburdens them and causes them to slow down the process of teaching and learning (Brookhart, 2013). Students think that the process of student assessment is merely a method of recalling and reproducing knowledge (Chetcuti et al., 2006). Low-quality assessment material is another issue for teachers as it badly affects the conduct and management of the whole assessment process. Students show less interest in attempting such tests. It is difficult for teachers to manage sufficient time for preparation, administration, and evaluation of assessment tasks, because of which quality of assessment tasks is affected (Buabeng et al., 2019).

There are many problems in classroom assessment in Pakistan. Here the teachers, either trained or not in assessment, accept the importance of the latest assessment techniques and agree on the concepts of assessment as learning and assessment for learning. But a majority of these do not use such techniques. They prefer to complete the syllabi and prepare the students to get better grades in final examinations. Therefore, they do not find sufficient time to use modern assessment techniques (Thomas, 2017). Lack of training in assessment is another issue that causes teachers to be unable to use modern assessment and statistical techniques. Feedback practices in classroom assessment are also poor due to the lack of interest of students, parents, and teachers. Moreover, higher-order thinking skills like creative writing and problem-solving are not assessed by the teachers (Shazadiy & Rafaty, 2018). Overloaded classes hinder the teachers from conducting effective classroom assessments. They find it difficult to prepare, conduct and evaluate multiple assessment tasks of the students concurrently. They face a shortage of time in adopting different assessment strategies due to their heavy workload. Some of the students and parents feel formative assessments are unnecessary and prefer better performance in final term exams, which creates difficulty for teachers to run smooth and effective classroom assessments (Hussain et al, 2019).

Research objectives

In this study, the researchers explored the changes needed to improve classroom assessment at the secondary level in Pakistan. The study was conducted in Federal Government Educational Institutions (FGEIs). These institutions are working throughout Pakistan and focus on providing education, which is based on quality and innovation, to its students (FGEIs, 2021). The students, teachers and principals were included in the population of the study. The research project was carried out during the period September, 2020-March, 2022. The following were the research questions of this study; (i)Which practices of classroom assessment, are being used in FGEIs? (ii)Which tools of classroom assessment, are being used in FGEIs? (iii)Which formats of classroom assessment, are being used in

FGEIs? (iv)What are the issues involved in classroom assessment in FGEIs? (v)Which changes should be made to improve classroom assessment in FGEIs?

Study design

A concurrent nested mixed-method research design within the Pragmatism paradigm was followed here. The mixed-method approach joins quantitative and qualitative methods in such a way that both methods support one another by exploring (questionnaires) and confirming (interviews) the research problem (Gall et al., 2013). In particular, a concurrent nested mixed-method research design helped the researchers to explore data collected from one portion of the population (students and teachers) in the form of questionnaires and confirm them from other portions of the population (principals) through semi-structured interviews.

Participants and procedures

The population of the study consisted of all principals, teachers, and students of all regions of FGEIs. The sample of the study was selected using a mixed-method (MM) sampling technique. Here, the probability sampling method was used for quantitative data, whereas qualitative data were collected using purposive sampling (Teddlie & Yu, 2017). A systematic sampling technique was deployed for quantitative data collection. This method helped the researchers to find essential cases for the study (Maxwell, 2005). Here, three schools from each region of FGEIs were systematically selected based on their average GPA (Kipkorir, 2015). The average GPA of schools was calculated as the Mean of SSC results for the last three years. So, a total of 36 schools were selected initially. From amongst these 36 selected schools, a total of 180 teachers and 180 students were randomly selected as the final sample. For qualitative data collection, 12 school principals for semi-structured interviews and 24 classrooms for qualitative observation were purposefully selected. In this way every effort was made to secure representativeness of the sample by schools, teachers, and students. Table 1 shows a complete sample for quantitative data collection of the study.

Instrumentation

The instruments used in this mixed-method study included a research questionnaire, interview and qualitative classroom observation.

A self-developed 40-item questionnaire was used for quantitative data collection. It contained dimensions like practices, tools, formats, issues and changes needed to improve classroom assessment. There were 10 items in the dimension of practices in classroom assessment which helped the researchers to explore the ways in which teachers were conducting classroom assessment. Similarly, there included five items each in the dimensions

of tools and formats in classroom assessment. It helped the researchers to find out the way the students were being assessed by the teachers. Moreover, 10 items were related to explore the issues faced by teachers and students in classroom assessment. Finally, 10 items were about the changes needed to improve classroom assessment. It helped the researchers to make suitable suggestions and recommendations about improving classroom assessment at the secondary level in the country. The research was carefully prepared in the light of the most recent literature and refined as per recommendations of the experts, too. All possible efforts were made to ensure the content validity and internal consistency of items. For checking its internal reliability, it was administered to 12 teachers and 48 students in a pilot study. Its internal reliability was equal to 0.92.

Table 1 Population and sample of the study

Name of region	Secondary schools		Secondary school teachers		Students	
	Total	Selected	Total	Selected	Total	Selected
1. Peshawar	28	03	45	20	885	25
2. Wah	22	03	35	16	743	15
3. Rawalpindi	30	03	45	18	832	25
4. Kharian	29	03	47	18	841	25
5. Lahore	06	03	15	09	280	05
6. Gujranwala	11	03	15	11	335	05
7. Multan	14	03	21	19	365	15
8 Bahawalpur	06	03	10	09	135	15
9. Karachi	10	03	14	13	180	15
10. Quetta	07	03	12	10	115	05
11. Chaklala	13	03	20	17	190	15
12. Fazaia	13	03	22	20	260	15
Total	189	36	295	180	5161	180

Table 2 Reliability values for the classroom assessment dimensions

Element of assessment	Number of items	Cronbach's alpha
Practices	10	.90
Tools	05	.98
Formats	05	.98
Issues	10	.88
Changes	10	.96
Overall	40	.92

Semi-structured interviews help the researchers to get an in-depth view of the research problem and maximum information in a short period (Cohen et al., 2010). Therefore, the researchers conducted semi-structured interviews with principals to obtain information regarding prevailing practices, tools, formats, issues, and changes in classroom assessment. Open-ended questions were included in these interviews. A non-judgmental role of the researchers was also ensured. The data thus obtained, was transcribed, coded, and interpreted accordingly.

Table 3 Sample for qualitative data collection

Principal Identity	Gender	Experience (Years)	Qualification	Grade level
PR-A	Female	13	M.Sc., M.Ed.	6-10
PR- B	Female	16	M.A., M.Ed.	6-10
PR- C	Male	12	Ph.D.	1-10
PR- D	Male	18	M.Sc., M.Ed.	6-10
PR- E	Male	15	M.Phil., M.Ed.	6-10
PR- F	Male	17	M.A., M.Ed.	1-10
PR- G	Male	18	M.Sc., M.Ed.	1-10
PR- H	Female	11	M.A., M.Ed.	1-10
PR- I	Male	13	M.A., M.Ed.	6-10
PR- J	Male	12	M.A., M.Ed.	1-10
PR- K	Female	22	M.Sc., M.Ed.	1-10
PR- L	Female	14	Ph.D.	1-10

Qualitative classroom observations help to provide a relationship between hypothetical statements and ground reality (Mouton & Marais, 1996). These are also supportive in complementing the findings and interpreting the results in a better way (Smit & Thomas, 2014). Hence qualitative classroom observations were also made a part of this study to obtain a real picture of the research phenomenon. Lessons were recorded and interpreted. These were also sent to the teachers to check for exactness and correctness.

Triangulation of data

Here, multiple methods, theories, investigators and/or data sets are used to answer the research questions. This process helps researchers to enhance the credibility and validity of research findings. Types of triangulation of data include methodological triangulation, theoretical triangulation, investigator triangulation, and data triangulation. In methodological triangulation, the researcher uses different methods to address a research topic. Varying

theories are deployed in theoretical triangulation, whereas multiple researchers are involved in data collection/analysis in the case of investigator triangulation. In data triangulation, researchers use multiple respondents, places and times to collect data. Triangulation of data helps the researchers to cross check evidence, find a complete picture of the research phenomenon and to enhance the validity of the research project (Bhandari, 2022). The researchers used triangulation of data by collecting quantitative data from teachers using the research questionnaire and qualitative data form principals through semi-structured interviews, as well as through classroom observations of teachers. It helped the researchers to attain the validity of the study. It also assisted in obtaining a complete picture of the research phenomenon.

Data analysis

The quantitative data were entered into the computer using SPSS version 24.0. For descriptive statistics, frequencies, Mean and standard deviation were calculated, whereas independent sample t-test and one-way ANOVA were used for inferential stats.

Results

Demographics of the respondents (Teachers)

As shown in Table 4, below, teachers in the age group 30-39 years formed the largest portion of the largest population of the study, with a frequency of 58; teachers in the age group 50-59 formed the smallest portion with a frequency of 17. Teachers of age groups 23-29 years and 40-49 years also presented a reasonable portion of the study population, with frequencies of 52 and 53 respectively. Similarly, teachers with experience of 11-20 years constituted the largest population of the study with a frequency of 101, and teachers with an experience of more than 21 years formed the smallest population of the study with a frequency of seven. Teachers with experience of 1-10 years presented a reasonable portion of the population with a frequency of 72. Teachers with a master of arts or science degree were the largest group of the population of the study, with a frequency of 161, and teachers with a Ph.D. were the smallest group of the study, with a frequency of 3.

Similarly, teachers having professional qualifications of B.Ed. constituted the majority of the study population, with a frequency of 105, and teachers having professional qualifications of M.Ed. constituted the minority of the study population, with a frequency of nine. Teachers with B.Ed. (Hons) and M.A. (Education) were also part of the study with frequencies of 46 and 20 respectively.

Table 4 Demographics of the respondents (Teachers)

Demographic	Variables	Frequency
Age (Years)	23-29	52
	30-39	58
	40-49	53
	50-59	17
Experience (Years)	1-10	72
	11-20	101
	21 and above	07
Academic Qualification	M.A./M.Sc.	161
	M.Phil./ MS	16
	PhD	03
Professional Qualification	B.Ed.	105
	B.Ed.(Honors)	46
	M.Ed.	09
	M.A.(Education)	20

Research question 1. Which practices of classroom assessment are being used in FGEIs?

Table 5 shows the views of teachers and students on practices in classroom assessment. The Means and standard deviations of the practices of classroom assessment are below.

According to teachers: teachers ask only those questions which they have taught (M = 3.51, SD = 0.63), they use easy language for better comprehension of students (M = 3.53, SD = 0.64), teachers pay special attention to academically weak students (M = 3.42, SD = 0.67), teachers encourage the students to maximize their participation (M = 3.41, SD = 0.53), teachers follow the guidelines of FBISE in preparation for assessment tests (M = 3.59, SD =0.51), teachers appreciate those who show good performance on tests (M = 3.57, SD = 0.54), a majority of students do copy from others (M = 1.83, SD = 0.41), they are punished if found copying from others (M = 1.84, SD = 0.54), They seek help from their relatives in completing their homework (M = 1.88, SD = 0.61), teachers select questions directly through exercises (M = 1.81, SD = 0.39).

Similarly, according to students: teachers ask only those questions which they have been taught (M = 3.54, SD = 0.61), they use easy language for better comprehension of students (M = 3.56, SD = 0.62), teachers pay special attention to academically weak students (M = 3.40, SD = 0.65), teachers encourage the students to maximize their participation (M =3.44, SD = 0.51), teachers follow the guidelines of FBISE in preparation for assessment tests (M = 3.52, SD = 0.52), teachers appreciate those who show good performance on tests (M =3.55, SD = 0.59), a majority of students do copy from others (M = 1.86, SD = 0.39), they are punished if found copying from others (M = 1.81, SD = 0.58), they seek help from their relatives in

completing their homework ($M = 1.87$, $SD = 0.64$), teachers select questions directly through exercises ($M = 1.86$, $SD = 0.43$).

The most common practices in classroom assessment include: teachers asking questions from amongst those that they have taught; teachers using easy language for better comprehension of students; teachers paying special attention to academically weak students; teachers encouraging the students for maximum participation in tests; teachers following a paper pattern of FBISE in-class assessment tests; and teachers appreciating the students who show good performance in tests. Similarly, the least common practices include a majority of students copying from other students during testing; students being punished if they are found copying from others; students seeking help from their relatives to complete their homework, and teachers selecting questions directly from their books.

Table 5 Practices in classroom assessment

Practices	Teachers		Students	
	Mean	SD	Mean	SD
1. Teachers ask only those questions which they have taught.	3.51	0.63	3.54	0.61
2. They use easy language for better comprehension of students.	3.53	0.64	3.56	0.62
3. Teachers pay special attention to academically weak students.	3.42	0.67	3.40	0.65
4. Teachers encourage the students to maximize their participation.	3.41	0.53	3.44	0.51
5. Teachers follow the guidelines of FBISE in preparation for assessment tests.	3.59	0.51	3.52	0.52
6. Teachers appreciate those who show good performance on tests.	3.57	0.54	3.55	0.59
7. A majority of students do involve in copying others.	1.83	0.41	1.86	0.39
8. They are punished if found involved in copying others.	1.84	0.54	1.81	0.58
9. They seek help from their relatives in completing their homework.	1.88	0.61	1.87	0.64
10. Teachers select questions directly through exercises.	1.81	0.39	1.86	0.43

The following paragraphs show extracts from semi-structured interviews of principals on practices in student assessment.

"I strongly recommend the teachers ask questions from amongst those that they have taught and to use easy language for better comprehension of students. A clear majority of the teachers follow these instructions and the GPA of my school remains good every year". [PR- D]

"The teachers in my school pay special attention to academically weak students, encourage them to maximum participation in tests and appreciate those who show good performance in tests". [PR- I]

During classroom observation of Teacher F, it was noted that the teacher was giving the assessment test from amongst the prescribed syllabus and the FBISE paper pattern was

also followed. In another class of Teacher E, it was noted the teacher was paying special attention to academically weak students. She was also found to use easy language for better comprehension of students.

Research question 2. Which tools of classroom assessment, are being used in FGEIs?

Table 6 below shows the views of teachers and students on tools in classroom assessment. The *Means* and standard deviations of tools of classroom assessment are presented below.

According to teachers: group work ($M = 3.11$, $SD = 0.46$), class test ($M = 3.14$, $SD = 0.48$), class exercise ($M = 3.18$, $SD = 0.39$), trial work during lessons ($M = 1.49$, $SD = 0.35$), homework ($M = 1.54$, $SD = 0.33$).

Similarly, according to students: group work ($M = 3.09$, $SD = 0.47$), class test ($M = 3.06$, $SD = 0.45$), class exercises ($M = 3.11$, $SD = 0.34$), trial work during lessons ($M = 1.52$, $SD = 0.37$), homework ($M = 1.57$, $SD = 0.31$).

Thus, the most common tools in classroom assessment include group work; class tests; and class exercises. Similarly, the least common tools include trial work during lessons, and homework.

Table 6 Tools in classroom assessment

Tools	Teachers		Students	
	Mean	*SD*	*Mean*	*SD*
11. Group work	3.11	0.46	3.09	0.47
12. Class test	3.14	0.48	3.06	0.45
13. Class exercise	3.18	0.39	3.11	0.34
14. Trial work during lessons	1.49	0.35	1.52	0.37
15. Homework	1.54	033	1.57	031

The following paragraphs present extracts from semi-structured interviews of principals on tools in student assessment:

"Class exercises and tests are vastly used by the teachers in my school at the secondary level as tools in student assessment. This results in better preparation of students for the SSC Examination in FBISE." [PR- B]

"I advise my teachers to use a variety of tools in student assessment, including trial work during lessons, class exercises, trial work during lessons, class tests, and homework." [PR- C]

In the classroom of Teacher C, it was noted the teacher was using group work as a tool for student assessment. During classroom observation of Teacher J, the students have observed the engaged in-class exercise. In another class of Teacher M, it was noted that

the teacher was telling the students about the importance of group work, class tests, and class exercises.

Research question 3. Which formats of classroom assessment, are being used in FGEIs?

Table 7 shows the views of teachers and students on formats in classroom assessment. The Mean and standard deviations of the formats of classroom assessment are presented below.

According to teachers the Means and standard deviations are: true/false questions (M = 3.12, SD = 0.41), multiple choice questions (M = 3.16, SD = 0.43), essay-type questions (M = 3.17, SD = 0.38), completion items (M = 1.44, SD = 0.36), matching items (M = 1.41, SD = 0.35).

Similarly, according to students, the Means and standard deviations are: true/false questions (M = 3.14, SD = 0.48), multiple choice questions (M = 3.18, SD = 0.44), essay type questions (M = 3.15, SD = 0.34), completion items (M = 1.46, SD = 0.37), matching items (M = 1.48, SD = 0.36).

Finally, it can be deduced that the most common formats in student assessment include True/false questions; Multiple type questions; and essay-type questions. Similarly, the least common formats include completion items and matching items.

Table 7 Formats in classroom assessment

Formats	Teachers		Students	
	Mean	*SD*	*Mean*	*SD*
16. True/false questions	3.12	0.41	3.14	0.48
17. Multiple choice questions	3.16	0.43	3.18	0.44
18. Essay type questions	3.17	0.38	3.15	0.34
19. Completion items	1.44	0.36	1.46	0.37
20. Matching items	1.41	0.35	1.48	0.36

The following paragraphs show extracts from semi-structured interviews of principals on formats of student assessment.

"At the secondary level, I advise the teachers to follow FBISE instructions regarding the assessment of students. A large majority follows multiple-choice and essay-type formats during the conduct of student assessments" [PR- C]

"My institution is continuously producing the best results at SSC Level in FBISE. A major reason for it is the usage of all student assessment formats including reason matching items, true/false questions, completion items, and essay type and multiple-choice questions." [PR- G]

It was observed in the classroom of Teacher A that he was giving the test which was composed of multiple-choice and essay-type questions. In another classroom of Teacher E,

it was seen that the teacher was taking the oral test in mathematics and true/false questions were being asked.

Research question 4. What are the issues in Classroom Assessment in FGEIs?

Table 8 shows the views of teachers and students on issues in classroom assessment. The *Means* and standard deviations of issues in classroom assessment are below.

According to teachers: Some of the students habitually remain absent on test days (M = 3.41, SD = 0.51), some of the students show less interest in assessment tasks (M = 3.47, SD= 0.60), the response of the parents to assessment tests is poor (M = 3.32, SD = 0.57), the school does not provide adequate materials for classroom assessment (M = 3.32, SD = 0.52), proper guidance on classroom assessment is not provided (M = 3.36, SD = 0.53), teachers lack professional assessment training (M = 3.49, SD = 0.56), classroom assessment increases the workload of teachers (M = 3.52, SD = 0.55), it takes much of their class teaching time (M = 3.43, SD = 0.59), teachers lack the skills to efficiently conduct assessment tasks (M = 3.51, SD = 0.52), sometimes, students do not submit their tests for checking (M = 3.49, SD = 0.57).

Similarly, according to students: some of the students habitually remain absent on test days (M = 3.36, SD = 0.53), some of the students show less interest in assessment tasks (M = 3.42, SD = 0.62), the response of the parents to assessment tests is poor (M = 3.31, SD = 0.57), the school does not provide adequate materials for classroom assessment (M = 3.37, SD = 0.51), proper guidance on classroom assessment is not provided (M = 3.48, SD = 0.55), Teachers lack professional assessment training (M = 3.46, SD = 0.58), classroom assessment increases the workload of teachers (M = 3.48, SD = 0.57), it takes much of their class teaching time (M = 3.42, SD = 0.53), teachers lack the skills to efficiently conduct assessment tasks (M = 3.50, SD = 0.55), sometimes, students do not submit their tests for checking (M = 3.42, SD = 0.52).

Finally, it can be deduced that the issues in classroom assessment include: some of the students habitually remain absent on test days, some of the students show less interest in assessment tasks, the response of the parents to assessment tests is poor, the school does not provide adequate materials for classroom assessment, proper guidance on classroom assessment is not provided, teachers lack professional assessment training, classroom assessment increases the workload of teachers, it takes much of their class teaching time, teachers lack the skills to efficiently conduct assessment tasks, sometimes, students do not submit their tests for checking.

Table 8 Issues in classroom assessment

Issues in classroom assessment	Teachers		Students	
	Mean	SD	Mean	SD
21. Some of the students habitually remain absent on test days.	3.41	0.51	3.36	0.53
22. Some of the students show less interest in assessment tasks.	3.47	0.60	3.42	0.62
23. The response of the parents to assessment tests is poor.	3.32	0.57	3.31	0.57
24. The school does not provide adequate materials for classroom assessment.	3.36	0.52	3.37	0.51
25. Proper guidance on classroom assessment is not provided.	3.49	0.53	3.48	0.55
26. Teachers lack professional assessment training.	3.48	0.56	3.46	0.58
27. Classroom assessment increases the workload of teachers.	3.52	0.55	3.48	0.57
28. It takes much of their class teaching time.	3.43	0.59	3.42	0.53
29. Teachers lack the skills to efficiently conduct assessment tasks.	3.51	0.52	3.50	0.55
30. Sometimes, students do not submit their tests for checking.	3.49	0.57	3.42	0.52

In the following paragraphs, extracts from semi-structured interviews of principals on challenges in student assessment have been mentioned.

"My teachers are facing several challenges in student assessment. Some of these include the habitual absence of some students on test day and less interest in assessment tasks, poor response and less cooperation of parents, and excessive." [PR- D]

"Some of the teachers lack professional assessment training and they have less interest in conducting assessment tests, too. This results in poor academic achievements of their students." [PR- I]

During classroom observation of Teacher A, it was noted that the attendance of students was poor. The teacher stated that some of the students habitually remain absent on test days. It was observed in the classroom of Teacher N that some of the students were not taking interest in the assessment task. The teacher highlighted that these students have less attention to their tests and their parents do not respond positively to assessment test and their results.

Research question 5. What are the changes needed to improve classroom assessment in FGEIs?

Table 9 shows the views of teachers and students on changes needed to improve classroom assessment. The Means and standard deviations of changes needed to improve classroom assessment are below.

According to teachers: a variety of assessment tools and formats may be used (M = 3.51, SD = 0.51), the workload of teachers may be reduced (M = 3.57, SD = 0.60), special attention may be given to the students with learning deficiencies (M = 3.52, SD = 0.57), students should be guided on improving their weaknesses (M = 3.56, SD = 0.52), extensive in-service training

on assessment is to be provided to teachers ($M = 3.59$, $SD = 0.53$), provision of adequate assessment materials to the teachers may be ensured ($M = 3.58$, $SD = 0.56$), a reasonable time should be allowed for students to solve assessment tasks ($M = 3.54$, $SD = 0.53$), questions may be based on student learning outcomes ($M = 3.51$, $SD = 0.55$), appreciation should be given to those who perform well ($M = 3.58$, $SD = 0.51$), engagement in test malpractices may be discouraged ($M = 3.56$, $SD = 0.54$).

Similarly, according to students: a variety of assessment tools and formats may be used ($M = 3.56$, $SD = 0.53$), the workload of teachers may be reduced ($M = 3.52$, $SD = 0.62$), special attention may be given to the students with learning deficiencies ($M = 3.51$, $SD = 0.57$), students should be guided on improving their weaknesses ($M = 3.57$, $SD = 0.51$), extensive in-service training on assessment is to be provided to teachers ($M = 3.58$, $SD = 0.55$), provision of adequate assessment materials to the teachers may be ensured ($M = 3.56$, $SD = 0.58$), a reasonable time should be allowed for students to solve assessment tasks ($M = 3.52$, $SD = 0.54$), questions may be based on student learning outcomes ($M = 3.54$, $SD = 0.50$), appreciation should be given to those who perform well ($M = 3.53$, $SD = 0.52$), engagement in test malpractices may be discouraged ($M = 3.51$, $SD = 0.51$).

It can be deduced that the teachers and students believe that: a variety of assessment tools and formats may be used, the workload of teachers may be reduced, special attention may be given to the students with learning deficiencies, students should be guided on improving their weaknesses, extensive in-service training on assessment is to be provided to teachers, provision of adequate assessment materials to the teachers may be ensured, a reasonable time should be allowed for students to solve assessment tasks, questions may be based on student learning outcomes, appreciation should be given to those who perform well, engagement in test malpractices may be discouraged.

Table 9 Changes needed to improve classroom assessment

Changes needed to improve classroom assessment	Teachers		Students	
	Mean	SD	Mean	SD
31. A variety of assessment tools and formats should be used.	3.51	0.51	3.56	0.53
32. The workload of teachers should be reduced.	3.57	0.60	3.52	0.62
33. Special attention may be given to the students with learning deficiencies.	3.52	0.57	3.51	0.57
34. Students should be guided on improving their weaknesses.	3.56	0.52	3.57	0.51
35. Extensive in-service training on assessment is to be provided to teachers.	3.59	0.53	3.58	0.55
36. Provision of adequate assessment materials to the teachers may be ensured.	3.58	0.56	3.56	0.58
37. A reasonable time should be allowed for students to solve assessment tasks.	3.54	0.53	3.52	0.54
38. Questions may be based on student learning outcomes.	3.51	0.55	3.54	0.50
39. Appreciation should be given to those who perform well.	3.58	0.51	3.53	0.52
40. Engagement in test malpractices may be discouraged.	3.56	0.54	3.51	0.51

In the following paragraphs, extracts from semi-structured interviews of principals on changes needed to improve classroom assessment have been mentioned.

"Workload should be decreased and continuous professional development is made available for teachers." [PR-C]

"Teachers should provide motivation and encouragement to the students. A variety of assessment techniques should be used by the teachers during the assessment task." [PR-E]

Inferential statistics

Hypothesis 1. The teachers differ by gender in their opinions on the changes needed to improve classroom assessment

Table 10 shows that the Mean scores for male and female teachers are 30.39 and 32.03 respectively. Male and female teachers have a *Mean* difference of 1.638 along with a t value of 2.21 and sig. value .035. It can be concluded that male and female teachers differ in their views on how to change classroom assessment for improvement.

Table 10 Differences among views of teachers upon the changes needed to improve classroom assessment, based on gender

Gender	N	*Mean*	*Std. D*	Df	M.D	T	Sig
Male	84	30.39	6.03				
				178	1.638	2.12	.035
Female	96	32.03	4.26				

Hypothesis 2. The teachers differ by age in their opinions on the changes needed to improve classroom assessment

To verify this hypothesis, an ANOVA test was deployed using SPSS (24.0). The results are shown in Table 11 And show that teachers of different ages differ in their opinions on changes needed to improve classroom assessment in FGEIs as ANOVA (F $(2,177)$ = 4.722, p = .004).

Table 11 Differences in issues in classroom assessment, based on age

	Sum of Squares	*Df*	*Mean Square*	*F*	*Sig*
Between Groups	49.531	2	12.368	4.722	.004
Within Groups	7934.462	177	39.351		
Total	7983.993	179			

Discussion, conclusion, recommendations

This study explored practices, tools, formats, issues, and changes needed to improve classroom assessment at the secondary level in FGEIs. The most common practices in classroom assessment included: teachers asking questions from amongst those, they have taught, teachers using easy language in an assessment task, teachers paying special attention to academically weak students, teachers encouraging students to participate in tests, and teachers following the paper pattern of FBISE. Moreover, the common tools included: group work, class test, and class exercises, whereas the common formats in classroom assessment included: true/false questions, multiple type questions, and essay-type questions. These findings are similar to those of Thomas (2017), Kipkorir (2015), and Shazadiy & Rafaty (2018). In addition to these, the study found that issues in classroom assessment included: some of the students do not take or submit assessment tests and show lack of interest, parents do not show good response on assessment test and its results, sufficient guidance, training and adequate materials are not provided to teachers on classroom assessment, workload of teachers increases and much of class teaching time is spent in assessment tests, and the teachers lack professional skills to efficiently conduct assessment tests. Finally, the study explored how classroom assessment at secondary level can be improved by taking various steps: different assessment tools and formats may be used, the workload of teachers may be reduced, students with learning deficiencies may be given special attention and they should be properly guided to improve improving their weaknesses, teachers may be provided extensive in-service training and adequate materials on assessment, students should be allowed sufficient time to solve assessment tasks, questions may be student learning outcomes (SLO)-based, students performing well should be appreciated, and engagement in test malpractices may be discouraged. These results are similar to the findings of previous research including Rahim et al. (2014), Hussain et al., (2019), and Buabeng et al., (2019).

Now we present suggestions and recommendations for the teachers, principals and administration of FGEIs. The teachers should motivate the students for their maximum and active participation in classroom assessment tasks. They should contact parents to highlight the importance of classroom assessment. They should prepare SLO-based assessment tasks and emphasize assessment for learning. The principals have a key importance in the FGEIs system and they should focus on improving the quality of classroom assessment. They may help the teachers by providing guidance, training and adequate materials of classroom assessment. Their interest in this task may cause an improvement in the overall results of the institutions. Students may become efficient at performing well at SSC Level Exam of the Federal Board of Intermediate & Secondary Education. Finally, that the administration of FGEIs should arrange continuous professional training of teachers on classroom assessment, and provision of adequate assessment materials should also be ensured. A central plan of assessment may also evaluate performance of students and teachers during the session.

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