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Student Experience, Satisfaction and Commitment in Blended Learning: A Structural Equation Modelling Approach

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Abstract: The COVID-19 pandemic led to higher education institutions adopting alternative teaching models to continue their work while complying with health measures. Specifically, in Spain, once the lockdown period was over, universities adopted the blended learning (BL) model, which allowed for a partial return to the classroom. The BL model meant a completely new approach for students that impacted their learning experience. Using structural equation modelling (SEM), this paper explores in-depth students' experience with BL—social–behavioural, cognitive–affective, sensory and formative—and tests the impact of BL on students' satisfaction and their commitment to learning. Data were collected from a sample of 467 undergraduate students at Complutense University of Madrid (Spain) who filled out a self-administered questionnaire. The model proposed shows fit indices above the recommended thresholds, indicating an adequate model fit. Results suggest a positive influence of the different dimensions of BL experience on satisfaction. In addition, satisfaction with BL had a positive impact on students' affective commitment. Going by these results, the students' experience with BL has been positive, increasing their willingness to study. Finally, the implications of these results for higher educational institutions are discussed and future research lines suggested.

Keywords: higher education; student experience; blended learning; satisfaction; commitment

MSC: 62H15

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1. Introduction

In the spring of 2020, schools and higher education institutions (HEIs) were closed in 185 countries, affecting 1,542,412,000 students, which is 89.4% of the total number of students enrolled in the world [1]. It was an unprecedented situation that, in record time, forced educational institutions and their actors to transform the work ecosystem in order to continue with the activities. The technical infrastructure of universities, pedagogical skills for distance learning and the specific requirements of some disciplines have been the main challenges recognised by HEIs [2]. At the same time, the forced move to distance teaching offered important opportunities to adopt more flexible forms of teaching, such as synchronous and asynchronous or hybrid teaching, better known as blended learning (BL).

In particular, these forms of teaching were applied in higher education, which is less dependent on the presence of the teacher for the learning process of students, thus making the latter less vulnerable to changes in the teaching model.

Consequently, although students in Spanish universities could return to the centres after the lockdown, the need to maintain social distancing norms led them to opt for the BL model, which flexibly combined face-to-face classes and activities with those taught online. This resulted in a new, and therefore little explored, educational context for students.

There has been a considerable amount of research into BL and its impact on student learning, including concepts such as satisfaction, commitment or experience, from a pedagogy point of view. However, no studies have been found that analyse BL using an experientially oriented approach (focusing on the student as a customer) and, even more

importantly, that analyse the relationships that the concepts of experience, satisfaction and commitment have with each other. It is known, in particular, that BL can improve student performance [3] or be satisfactory [4]. Nevertheless, the impact of BL on student commitment through satisfaction, which is considered an intermediate outcome of the student experience and leads to student commitment, has not been studied, least of all during a pandemic period. In fact, several studies have looked at the effect of commitment on satisfaction with BL but not at how satisfaction fosters greater student commitment [5,6].

The literature on BL presents diverse methodological approaches (see Appendix A, Table A1). The main method adopted is based on descriptive analyses, such as frequencies or comparison of means [7–9]. Other studies employ qualitative tools, such as focus groups or personal interviews [10–12]. However, few studies deepen in BL using a structural equation approach [5,13,14].

This research aims to explore in-depth students' lived experiences during the implementation of the BL model during the COVID-19 period and to investigate its impact on student satisfaction and commitment. In particular, the study approaches the experience not from a pedagogical point of view (as to higher or lower performance) but from a more experientially oriented approach and focused on the affective, behavioural, sensory or social situations students have lived through. In addition, the work attempts to answer the following research questions:

1. What aspects of the experience most influence student satisfaction with BL?
2. How does student experience influence satisfaction with BL and commitment to learning?

The paper is organised into four sections. To begin with, it focuses on the existing literature on BL and the development of the hypotheses. Then, the methodology used is explained, and the results are presented. Finally, the results obtained are discussed, and conclusions are drawn.

2. Literature Review

2.1. Blended Learning

BL was first implemented at Stanford University in the 1960s and 1970s, with the onset of the usage of videos, allowing students to learn outside the classroom. Over time, specific learning systems continued to be developed, which, with the great technological advances since the 2000s, have given rise to today's BL [15].

BL is defined as "the thoughtful integration of face-to-face classroom learning experiences with online learning experiences" [16] (page 96). This definition has evolved to a learning environment that allows the incorporation and combination of face-to-face, computer-based, distance and mobile learning both inside and outside the classroom [17,18]. The different combinations that can be developed generate a wide variety of BL models to suit the needs of the student, the teacher and the subject matter [18]. In each model, the weight of the teacher's presence and the student's self-learning through technological resources varies, which highlights the principal characteristics of BL such as presence, self-learning, distance and ubiquity [7].

BL thus encourages students to be more autonomous, allowing them to practice self-organisation and follow the pace of learning that best suits them [19]. In addition, not having to go to the classroom every day saves time, which students perceive as more study time, leading to better academic performance [20]. The use of technology improves students' digital skills, besides increasing their participation in the classroom [21].

From a social point of view, BL allows interactions between students to take place not only in the classroom but also through virtual environments. This benefits the integration of students, forming communities that reduce students' sense of loneliness [22]. In addition, the fact that students with disabilities do not have to travel to the university to receive classes favours this collective, given that many facilities are not prepared for them, affecting their learning [19].

In short, BL is learner-centred learning with a focus on the learner's ability to acquire and process knowledge and solve problems [21].

Despite this, BL is associated with problems of accessibility and equality. The need for computers or other devices that enable online activities to be monitored is a problem for students with limited resources. This engenders differences between students, creating an entry barrier that universities and public institutions must detect and try to resolve [23].

To illustrate and clarify how BL differs from face-to-face and fully online learning models, Figure 1 shows the characteristics of learning models.

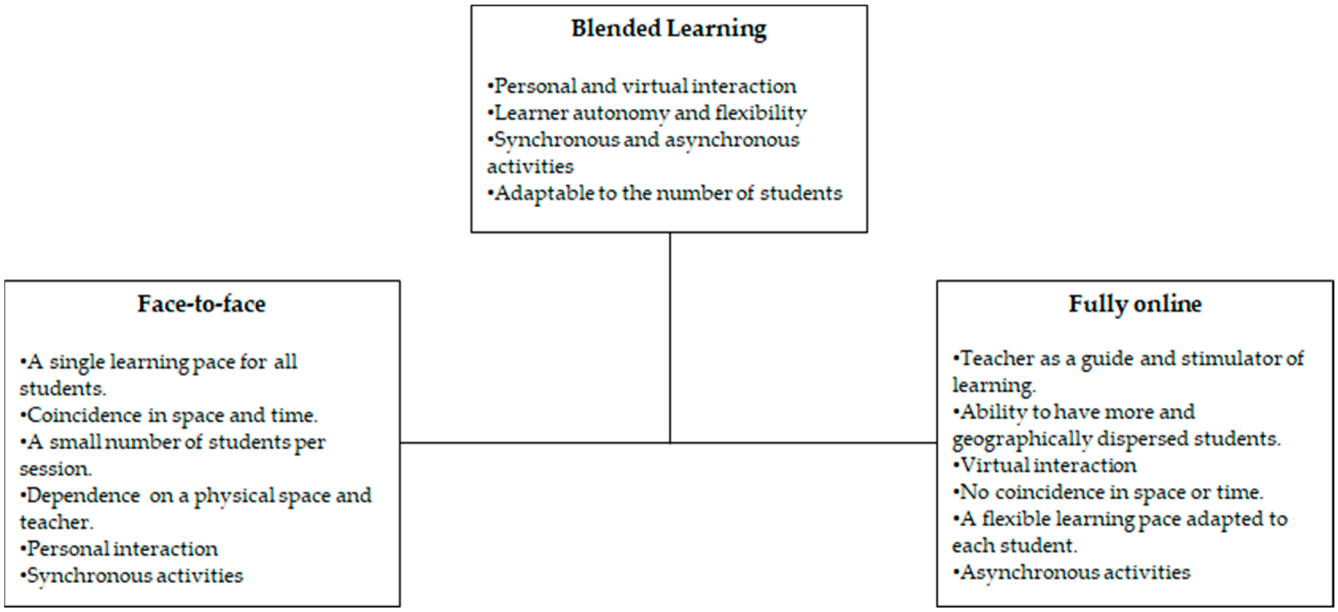

Figure 1. Characteristics of learning modalities.

As can be seen in Figure 1, the face-to-face and fully online models present totally opposite and different characteristics. BL, on the other hand, is not a disruptive model with respect to either the fully online or the face-to-face models but rather integrates the benefits of both models to form a new model that enhances student learning.

2.2. Educational Experience

In business, the consumer experience encompasses the sensations, feelings, cognitions and behavioural responses of a consumer when coming into contact with the brand, which, in turn, has repercussions on the consumer's satisfaction and commitment to the brand [24]. When applied to education, this would be the sensations, feelings, cognitions and behavioural responses that students experience with the educational services, systems and products of their institution [25]. Of the dimensions of experience mentioned by Brakus et al. [24], one based on the environment in which the BL model takes place (classroom, technical infrastructure, teaching methodology) should be added, given that this is a key element in the educational environment and one of the main touchpoints of the student with the institution.

Social–behavioural experience is based on the behaviours and relationships established with peers or the staff of the institution. In this regard, previous studies show that in BL, there is greater socialisation among students and between students and the teacher [21,26], as well as greater participative behaviour of the students in the activities carried out [27]. These behaviours have been shown to be positively related to satisfaction in BL [28]. Based on the previous results, the following hypothesis is proposed:

H1. *Social–behavioural experience of students positively influences satisfaction with BL.*

Affective–cognitive experience reflects how learning in BL has made the student feel, both emotionally and intellectually. Gazica et al. [29] demonstrated that BL did not generate

greater motivation in students in comparison to the face-to-face modality. However, it does provide the student with a greater capacity for reasoning and understanding the subject matter [30]. This experience has been found to be a predictor of satisfaction with BL [6], which is why the following hypothesis is proposed:

H2. *Affective–cognitive experience of students positively influences satisfaction with BL.*

Sensory experience in education involves students' perceptions through the senses, with a particular focus on sight and hearing. Unfortunately, no previous literature could be located that studies the sensory experience of the student in BL environments or its relationship with student satisfaction in this modality. Even so, if we understand that for the correct functioning of BL, it is necessary for the student to be able to hear and see the teacher and the class materials either in the classroom or online, it seems logical to pose the following hypothesis:

H3. *Sensory experience of students positively influences satisfaction with BL.*

Formative experience depends on the infrastructures available, the methodology used and the organisation of the BL model. In this regard, there are studies that report problems in the organisation of online and face-to-face activities, leading to an overlap between them [31], or student difficulties with the introduction of new methodologies [32]. This gives rise to the following hypothesis:

H4. *Formative experience of students positively influences satisfaction with the BL model.*

Satisfaction is understood as the degree to which students enjoy their studies [33] and is a predictor of their commitment to learning [34]. Previous literature has shown that there is a positive relationship between student satisfaction and commitment to learning [6,35], particularly as to normative and affective commitment [36]. This takes place when students see the objectives of the course reflected in the activities carried out and the involvement of the teacher, which predisposes them to take a greater interest in their studies [6]. Therefore, the following hypotheses are proposed:

H5. *Student satisfaction positively influences affective commitment.*

H6. *Student satisfaction positively influences normative commitment.*

Based on the above, the conceptual model shown in Figure 2 depicts the proposed model and the hypotheses put forward. The model shows the social-behavioural, affective–cognitive, sensory and formative experience dimensions, as well as the resultant satisfaction and, in turn, normative and affective commitment.

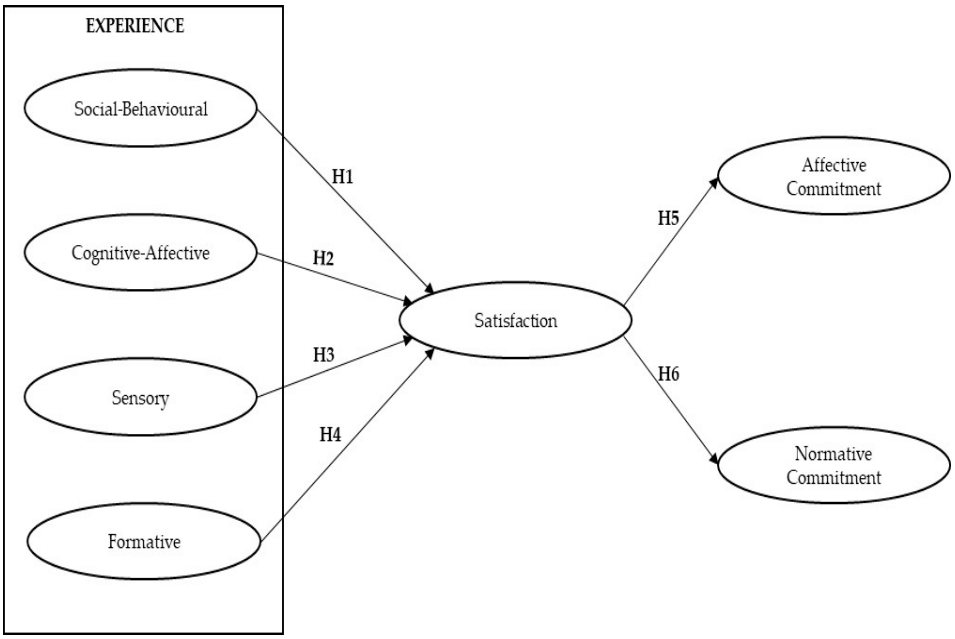

Figure 2. Conceptual model and hypotheses.

3. Methodology

3.1. Survey

A self-administered questionnaire was sent to undergraduate students of the following disciplines: social and legal sciences, arts and humanities, health sciences, sciences, engineering (see Appendix A, Table A2). The fieldwork was carried out in April and May 2022; prior to the questionnaires, participants provided informed consent, and the data obtained were treated with the utmost confidentiality and following all ethical protocols.

The questionnaire was designed to measure the four dimensions of experience (social–behavioural, cognitive–affective, sensory and formative), satisfaction and commitment to learning in a BL environment. To measure social–behavioural, cognitive–affective and sensory experience dimensions, the items proposed by Brakus et al. [24] were adapted, while for the formative experience, items from Mbwesa [37] and Parasuraman et al. [38] were adapted. Satisfaction was measured using the items developed by Chen and Chau [7], and normative and affective commitment by adapting items from Meyer, Allen and Smith [39] and Fernandez-Lores et al. [40], respectively. All items were measured on a Likert-5 scale, with 1 representing strongly disagree and 5 strongly agree. Table 1 lists the items used to measure each variable.

Table 1. Variables and items used in survey.

Variable	Item	Description	Adapted from
Social–Behavioural	SOB1	Strengthened my relationship with peers	[24]
	SOB2	Facilitated my relationship with peers	
	SOB3	Broadened my circle of friends	
Cognitive–Affective	COA1	Encouraged me to study collaboratively with peers	[24]
	COA2	Encouraged me to help my peers	
	COA3	Encouraged me to work as a team	
Sensory	SEN1	I heard the teacher well	[24]
	SEN2	I heard my peers well	
	SEN3	I saw the teacher well	

Table 1. *Cont.*

Variable	Item	Description	Adapted from
Formative	FOR1	The university had up-to-date equipment	[38]
	FOR2	The virtual environments used were adequate	[37]
	FOR3	My faculty organised the BL courses appropriately	[37]
Satisfaction	SAT1	If I have the opportunity to do another course in BL, I would gladly do so	[7]
	SAT2	I would recommend it to other students	
Affective Commitment	AC1	Because it felt good	[40]
	AC2	Because I was having fun	
	AC3	Because I enjoyed it	
Normative Commitment	NC1	Because it was a must for me	[39]
	NC2	Because I felt it was my obligation	
	NC3	Because it was wrong to stop doing it	

The questionnaire was reviewed by a panel of experts to assess the content validity and to ensure the accuracy of the translations of the texts. In order to check the clarity of the questions and elicit information on adequacy in terms of completion time, a pretest was carried out on a group of 23 students. Some items were eliminated and reworded for simplification and comprehension. In addition, an ethics committee gave a positive assessment of the proposed items and the procedure for obtaining them. The analysis of the data obtained was carried out with SPSS Statistics 25.

3.2. Sample

Of 501 survey responses obtained between April and May 2022 from undergraduate students at the Complutense University of Madrid (Spain), 467 were found valid. The sample had a cross-sectional character and was obtained only from the Complutense University of Madrid because it adopted a basic BL model in which students had one week of face-to-face classes and another week of online classes. This meant that within the particularities that each case might have, there was a common pattern in all of them, homogenising the experience in this learning modality, giving rise to variability in the sample but not in the object of study. The characteristics of the sample are shown in Table 2.

Table 2. Characteristics of the sample.

Characteristic	%
Gender	
Male	67.7
Female	25.9
I would rather not say	6.4
Field of knowledge	
Social and legal sciences	38.1
Arts and humanities	29.1
Health sciences	18.4
Sciences	10.1
Engineering	4.3
Classes attended	
0%	9.4
25%	3.6
50%	7.1
75%	29.3
100%	50.5

4. Results

Structural equation modelling (SEM) was carried out using the maximum likelihood estimation method to corroborate the hypotheses, using SPSS AMOS 28.0. First, the measurement model was estimated to assess factor structure, reliability, convergent validity and discriminant validity. Subsequently, the parameters of the structural model were estimated, and the hypothesised relationships were tested.

4.1. Measurement Model

The criteria for validity and reliability are used to check the fit of the measures. Reliability represents the ability of a measuring instrument (items) to consistently deliver the same result. Validity represents the degree to which a measuring instrument (items) accurately measures a concept [41].

The reliability of the subscales of the model was adequate, with alpha coefficients above 0.7 [42].

The factor loadings, composite reliability and mean variance extracted were assessed for convergent validity, as suggested by Hair et al. [42]. The loadings of all items exceeded the recommended value of 0.6, and the composite reliability and the average variance extracted in all cases exceeded the recommended values of 0.7 and 0.5, respectively, as shown in Table 3.

Table 3. Reliability and validity of measures.

Item	Mean	SD	Loading	α	CR	AVE
SOB1	1.97	1.241	0.838			
SOB2	1.88	1.142	0.85	0.919	0.949	0.883
SOB3	1.82	1.124	0.858			
COA1	2.17	1.255	0.789			
COA2	2.46	1.311	0.854	0.913	0.945	0.88
COA3	2.33	1.311	0.845			
SEN1	3.04	1.206	0.877			
SEN2	2.82	1.278	0.832	0.884	0.993	0.843
SEN3	3.02	1.282	0.842			
FOR1	3.64	1.415	0.782			
FOR2	3.42	1.414	0.798	0.855	0.919	0.837
FOR3	3.34	1.495	0.774			
SAT1	2.2	1.427	0.857	0.936	0.842	0.74
SAT2	2.19	1.36	0.81			
AC1	2.87	1.391	0.766			
AC2	2.32	1.268	0.828	0.916	0.883	0.743
AC3	2.41	1.317	0.815			
NC1	3.8	1.24	0.911			
NC2	3.68	1.293	0.886	0.895	0.915	0.787
NC3	3.49	1.354	0.828			

Table 4 demonstrates the discriminant validity between the constructs, as the mean variance estimates extracted, which exceeded 0.5, were higher than all the phi-squared correlations between the constructs [43].

Table 4. Discriminant validity.

	SOB	COA	SEN	FOR	SAT	AC	NC	AVE
SOB	1							0.883
COA	0.272	1						0.88
SEN	0.241	0.259	1					0.843
FOR	0.177	0.190	0.168	1				0.837
SAT	0.325	0.349	0.309	0.228	1			0.74
AC	0.249	0.267	0.237	0.174	0.731	1		0.743
NC	0.030	0.032	0.029	0.021	0.093	0.071	1	0.787

4.2. Structural Model

The structural model was estimated (see Figure 3). The recommended fit indices in assessing model adequacy [44,45] were above the recommended range [46,47], indicating a respectable fit: $\chi 2$ = 392.822; df = 163; ($p < 0.01$); comparative fit index (CFI) = 0.968; Tucker–Lewis index (TLI) = 0.963 and root mean error of approximation (RMSEA) = 0.054 with a 90% confidence interval of 0.048 and 0.061. Table 5 shows the standardized path coefficients of the relationships of dimensions.

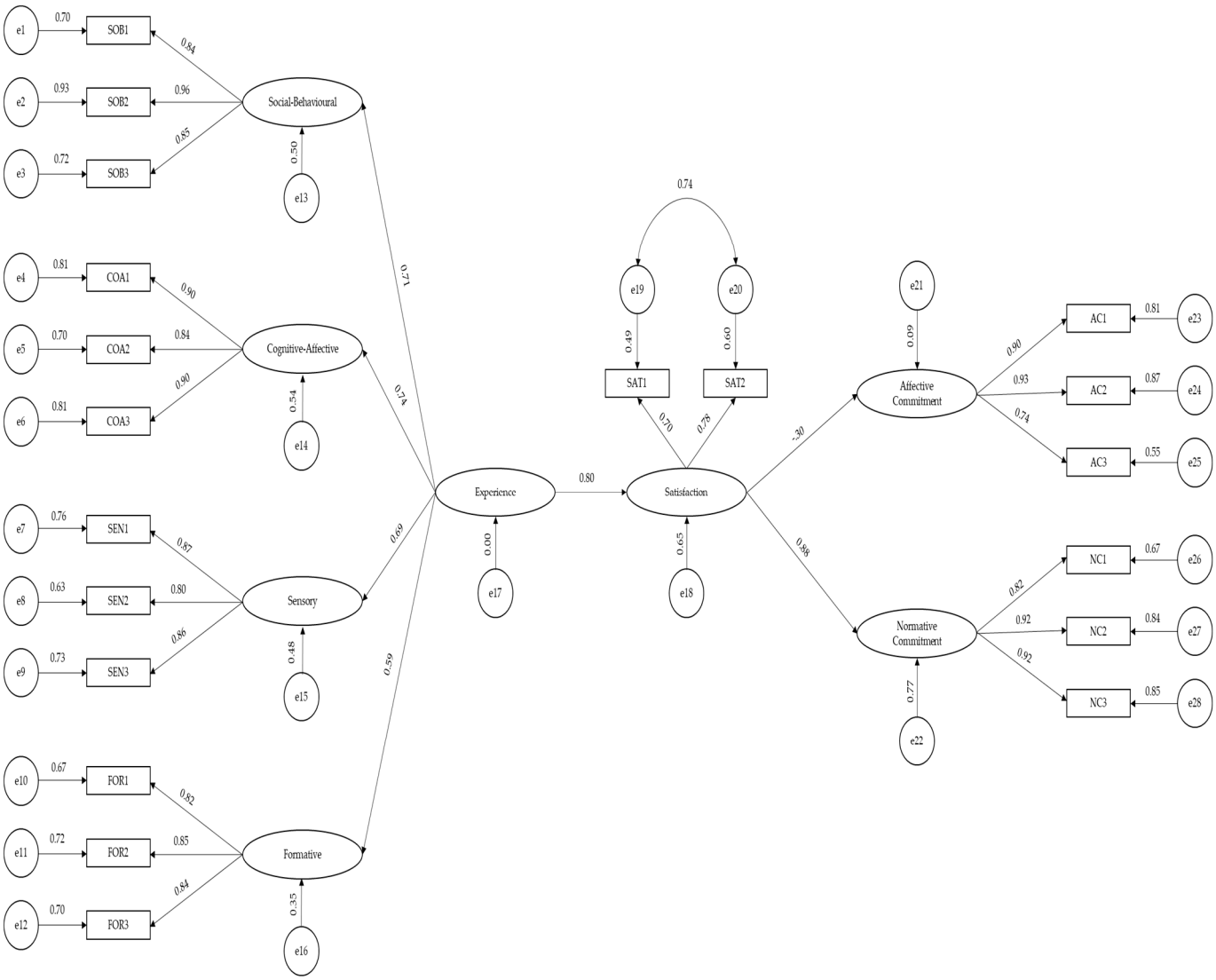

Figure 3. Estimation of model.

Table 5. Structural model results.

Effect	Path	SE	*p*	H
SOE → EXP	0.709	0	<0.001	Supported
COA → EXP	0.736	0.095	<0.001	Supported
SEN → EXP	0.692	0.105	<0.001	Supported
FOR → EXP	0.593	0.107	<0.001	Supported
EXP → SAT	0.804	0.105	<0.001	Supported
SAT → NC	−0.305	0.057	<0.001	Not supported
SAT → AC	0.875	0	<0.001	Supported

All standardised path coefficients were positive and significant at 99% confidence, except for the relationship between satisfaction and normative commitment (standardised path coefficient = −0.305; $p < 0.01$). These results support the hypotheses stated, except for H6 ('Student satisfaction positively influences normative commitment'), in which, despite being significant, the opposite effect is observed, with a negative relationship between satisfaction and normative commitment, consequently rejecting H6.

Among the different dimensions of experience, the hypotheses (H1, H2, H3, H4) are corroborated, with cognitive–affective experience having the greatest weight (standardised path coefficient = 0.736; $p < 0.01$) and formative experience being the one that, surprisingly, contributes the least (standardised path coefficient = 0.59; $p < 0.01$). Experience has a strong influence on student satisfaction with the BL model (standardised path coefficient = 0.804; $p < 0.01$), such that as experience increases, so too does satisfaction. Finally, increasing satisfaction has greatly increased affective commitment (standardised path coefficient = 0.875; $p < 0.01$), supporting H5.

5. Conclusions

The aim of the study was to explore the students' experience of the BL model and its impact on their satisfaction and commitment to learning during COVID-19. This experiment was carried out in a university with students from several fields of knowledge, highlighting the impact of the student experience on their satisfaction and commitment to their learning using BL during COVID-19.

The results demonstrate that a positive experience with BL contributes positively to student satisfaction and affective commitment. These results are broadly in line with what has been suggested by the previous literature. Specifically, the different dimensions of experience influence satisfaction, with cognitive–affective and social–behavioural experiences having the greatest effect. The latter is of particular interest, given that Gao et al. [13] established that there was no relationship between the social–behavioural experience and satisfaction. However, this may be explained by the fact that the BL model encourages students to socialise [21,26], mainly through online communication, such as class forums and the use of social networks, which during the pandemic, when social interactions were reduced, became more important [22]. The effect of the cognitive–affective experience is underpinned by the fact that interaction and collaboration with other students encourage discussion and critical thinking, which translates into increased learning and satisfaction [9]. The positive influence of the formative and sensory experience is justified by the fact that the perception of an efficient and suitable study environment promotes satisfaction [5]. Another noteworthy result is the negative and significant effect that satisfaction has on normative commitment. This contradicts the previous literature but may be justified by the existing health situation, which may have conditioned and influenced this relationship. Affective commitment, on the other hand, has a positive relationship with satisfaction. This is explained by the fact that students in this learning model feel more comfortable and enjoy studying, which makes them more involved in learning as a matter of enjoyment [11,19,20].

These results deepen the study of the experience in the BL model, showing that it can be very satisfactory and can strengthen the affective bond of the student with the study

and their academic training. This work takes the study of the BL experience to its ultimate consequence, student commitment, filling a gap unexplored to date.

Furthermore, it also has implications for the university by demonstrating the importance of managing the student experience for greater success in the implementation of BL. It stresses that universities are not external to the existing relationships in the markets and should consider their students as customers and act accordingly.

In concrete terms, the results encourage educational institutions to boost their investment in infrastructure and teacher training. Since, as demonstrated, the sensory and formative experiences positively influence student satisfaction, so improving aspects linked to these experiences would contribute to greater satisfaction. This study also highlights the importance of a clear and concrete institutional strategy in the implementation of BL, which reduces variability in the student experience. Finally, as shown above and revealed by earlier studies, BL as an environment is conducive to the socialisation of students through online and offline communications. In this regard, the realisation of activities inside and outside the classroom that involve students and lead to the development of personal relationships would be advisable for an improvement in the social–behavioural experience.

This work is not without limitations. Firstly, the data collected were self-reported by the students, so in order to fully understand the experience, additional information was necessary, for which in-depth interviews were conducted. In addition, self-reported data has the inherent limitation that it only considers the subjects' vision, so the results should be cross-referenced with academic results. This was not feasible in our study because, during the pandemic, the change in the educational model also involved a change in the evaluation system. Finally, the study has the limitations of transversal studies, such as data being obtained at a single point in time. However, since the objective of this study was to analyse the student's experience in BL during COVID-19, this type of study seems appropriate.

With regard to future lines of research, the replication of this study outside contexts of health crises or similar situations, which could condition the experience in these teaching models, can be considered. Furthermore, contrasting the students' experience with their academic performance could contribute to a greater understanding of students' experiences in this educational context.

Author Contributions: Conceptualisation, D.G. and S.B.-T.; methodology, D.G. and S.B.-T.; software, S.B.-T.; validation, D.G.; formal analysis, S.B.-T.; investigation, S.B.-T.; resources, S.B.-T.; data curation, S.B.-T.; writing—original draft preparation, S.B.-T.; writing—review and editing, D.G.; visualisation, D.G.; supervision, D.G.; project administration, D.G. All authors have read and agreed to the published version of the manuscript.

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Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by Ethics Committee of Complutense University of Madrid (protocol code CE_20220317-09_SOC and date of approval: 4 April 2022).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: Not applicable.

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Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. A sample of approaches from previous studies.

Author	Approach	Methodology	Relationship
[8]	Pedagogy	Descriptive	Academic experience → Dropout
[9]	Pedagogy	Descriptive	BL → Satisfaction
[10]	Pedagogy	Descriptive and in-depth interviews	Preference between face-to-face and BL
[11]	Pedagogy	Case studies	BL → Commitment
[14]	Technological	Partial least squares	Commitment → Continuance intention
[5]	Pedagogy	Partial least squares	BL → Commitment → Satisfaction
[19]	Pedagogy	Descriptive and in-depth interviews	BL → Performance
[21]	Pedagogy	Descriptive	BL → Skills acquisition
[28]	Pedagogy/Technological	Descriptive	BL → Interaction and satisfaction
[6]	Pedagogy	Descriptive and in-depth interviews	Commitment → Satisfaction
[32]	Pedagogy	Descriptive and in-depth interviews	BL → Satisfaction
[34]	Pedagogy	Descriptive	BL → Benefit perceptions

Table A2. Survey. (This survey has been translated from its original version used with the participants).

Your Experience in Blended Learning					
The following questionnaire aims to study the UCM student's experience with blended learning in the academic year 2020/2021. In this academic year, COVID-19 forced UCM to adopt blended learning, combining online and face-to-face learning. The following questions refer to this learning model during this period. Please rate each item according to how accurately it describes your experience, using the following scale: 1 = strongly disagree to 5 = strongly agree					
The following statement best describes my academic experience during blended learning:					
	1	2	3	4	5
Teachers dedicated time to attend to the students					
Teachers provided personalised attention to students					
The university had up-to-date equipment					
The virtual environments used were adequate					
My faculty organised the BL courses appropriately					
Teachers did an adequate assessment of the subject					
Teachers used an appropriate teaching methodology					
The content of the courses was adapted to blended learning					

Table A2. *Cont.*

Your Experience in Blended Learning					
The following statement best describes my blended learning classes:					
	1	2	3	4	5
I heard the teacher well					
I heard my peers well					
I saw the teacher well					
I could see the audio-visual material well					
Strengthened my relationship with peers					
Facilitated my relationship with peers					
Broadened my circle of friends					
Encouraged me to study collaboratively with peers					
Encouraged me to help my peers					
Encouraged me to work as a team					
Were stimulating					
Encouraged me to be more active in class.					
I would have continued studying in blended learning because:					
NOTE: We know that in the last academic year, blended learning was compulsory, so the following questions are aimed at assessing the main reasons that led you to continue studying in this learning model instead of dropping your degree or dropping subjects.					
	1	2	3	4	5
I felt good					
I was having fun					
I enjoyed it					
I was highly motivated					
It was a must for me					
I felt it was my obligation					
It was wrong to stop doing it					
I would have felt guilty if I didn't do it					
With regard to blended learning:					
	1	2	3	4	5
If I had the opportunity to do another course in BL, I would gladly do so					
I would recommend it to other students					
I was satisfied					
Served my needs well					
In which year of your course were you enrolled during the last academic year (tick the option where you had the highest number of subjects enrolled):					
First Second Third Fourth Fifth Not at university					

Table A2. *Cont.*

Your Experience in Blended Learning
What percentage of the total number of classes did you attend in the last academic year?
0% 25% 50% 75% 100%
Field of knowledge
Social and legal sciences Arts and humanities Health sciences Sciences Engineering
Gender
Male Female I would rather not say

References

1. Marinoni, G.; Van't Land, H.; Jensen, T. The impact of COVID-19 on higher education around the world. In *IAU Global Survey Report*; International Association of Universities: Paris, France, 2020; Volume 23. Available online: https://www.iau-aiu.net/IMG/pdf/iau_covid19_and_he_survey_report_final_may_2020.pdf (accessed on 8 September 2022).
2. Dhawan, S. Online learning: A panacea in the time of COVID-19 crisis. *J. Educ. Technol. Syst.* **2020**, *49*, 5–22. [CrossRef]
3. Ozadowicz, A. Modified blended learning in engineering higher education during the COVID-19 lockdown-building automation courses case study. *Educ. Sci.* **2020**, *10*, 292. [CrossRef]
4. Bezliudna, V.; Shcherban, I.; Kolomiyets, O.; Mykolaiko, V.; Bezliudnyi, R. Master Students' Perceptions of Blended Learning in the Process of Studying English during COVID 19 Pandemic in Ukraine. *Rupkatha J. Interdiscip. Stud. Humanit.* **2021**, *13*, 1–14. [CrossRef]
5. Fisher, R.; Perényi, A.; Birdthistle, N. The positive relationship between flipped and blended learning and student engagement, performance and satisfaction. *Act. Learn. High. Educ.* **2021**, *22*, 97–113. [CrossRef]
6. Lane, S.; Hoang, J.G.; Leighton, J.P.; Rissanen, A. Engagement and satisfaction: Mixed-method analysis of blended learning in the sciences. *Can. J. Sci. Math. Technol. Educ.* **2021**, *21*, 100–122. [CrossRef]
7. Cheng, G.; Chau, J. Exploring the relationships between learning styles, online participation, learning achievement and course satisfaction: An empirical study of a blended learning course. *Br. J. Educ. Technol.* **2016**, *47*, 257–278. [CrossRef]
8. Soler Morejón, C.D.D.; Borjas Borjas, F. Experiencias del b-learning en el curso "Pedagogía básica para la Educación Superior". *Educ. Méd. Super.* **2020**, *34*, e2035. Available online: http://scielo.sld.cu/scielo.php?script=sci_arttext&pid=S0864-21412020000400003 (accessed on 26 July 2022).
9. Al Awamleh, A. Students satisfaction on blended learning in the school of sport sciences. *Ann. Appl. Sport Sci.* **2020**, *8*, e803. Available online: http://aassjournal.com/article-1-803-en.html (accessed on 21 September 2022). [CrossRef]
10. Mali, D.; Lim, H. How do students perceive face-to-face/blended learning as a result of the Covid-19 pandemic? *Int. J. Manag. Educ.* **2021**, *19*, 100552. [CrossRef]
11. Shohel, M.; Cann, R.; Atherton, S. Enhancing Student Engagement Using a Blended Learning Approach: Case Studies of First-Year Undergraduate Students. *Int. J. Mob. Blended Learn. (IJMBL)* **2020**, *12*, 51–68. [CrossRef]
12. Bruggeman, B.; Tondeur, J.; Struyven, K.; Pynoo, B.; Garone, A.; Vanslambrouck, S. Experts speaking: Crucial teacher attributes for implementing blended learning in higher education. *Internet High. Educ.* **2021**, *48*, 100772. [CrossRef]
13. Gao, B.W.; Jiang, J.; Tang, Y. The effect of blended learning platform and engagement on students' satisfaction—The case from the tourism management teaching. *J. Hosp. Leis. Sport Tour. Educ.* **2020**, *27*, 100272. [CrossRef]
14. Goh, T.T.; Yang, B. The role of e-engagement and flow on the continuance with a learning management system in a blended learning environment. *Int. J. Educ. Technol. High. Educ.* **2021**, *18*, 49. [CrossRef]
15. Singh, J.; Steele, K.; Singh, L. Combining the Best of Online and Face-to-Face Learning: Hybrid and Blended Learning Approach for COVID-19, Post Vaccine, & Post-Pandemic World. *J. Educ. Technol. Syst.* **2021**, *50*, 140–171. [CrossRef]
16. Garrison, D.R.; Kanuka, H. Blended learning: Uncovering its transformative potential in higher education. *Internet High. Educ.* **2004**, *7*, 95–105. [CrossRef]
17. Goncharov, V.V.; Stepanova, D.I.; Kovalev, D.V.; Kovaleva, T.A.; Batyrshina, A.R. Blended learning perspectives for students (university experience under constraints due to COVID-19 pandemic). *Rev. Incl.* **2020**, *7*, 288–300.

18. Siripongdee, K.; Pimdee, P.; Tuntiwongwanich, S. A blended learning model with IoT-based technology: Effectively used when the COVID-19 pandemic? *J. Educ. Gift. Young Sci.* **2020**, *8*, 905–917. [CrossRef]
19. Buck, E.; Tyrrell, K. Block and blend: A mixed method investigation into the impact of a pilot block teaching and blended learning approach upon student outcomes and experience. *J. Furth. High. Educ.* **2022**, *46*, 1078–1091. [CrossRef]
20. Peimani, N.; Kamalipour, H. The Future of Design Studio Education: Student Experience and Perception of Blended Learning and Teaching during the Global Pandemic. *Educ. Sci.* **2022**, *12*, 140. [CrossRef]
21. Hadiyanto, H.; Failasofah, F.; Armiwati, A.; Abrar, M.; Thabran, Y. Students' Practices of 21st Century Skills between Conventional learning and Blended Learning. *J. Univ. Teach. Learn. Pract.* **2021**, *18*, 7. [CrossRef]
22. Asghar, M.Z.; Iqbal, A.; Seitamaa-Hakkarainen, P.; Barbera, E. Breaching learners' social distancing through social media during the covid-19 pandemic. *Int. J. Environ. Res. Public Health* **2021**, *18*, 11012. [CrossRef]
23. Carius, A.C. Network Education and Blended Learning: Cyber University concept and Higher Education post COVID-19 Pandemic. *Res. Soc. Dev.* **2020**, *9*, e8209109340. [CrossRef]
24. Brakus, J.J.; Schmitt, B.H.; Zarantonello, L. Brand experience: What is it? How is it measured? Does it affect loyalty? *J. Mark.* **2009**, *73*, 52–68. [CrossRef]
25. Matus, N.; Rusu, C.; Cano, S. Student eXperience: A Systematic Literature Review. *Appl. Sci.* **2021**, *11*, 9543. [CrossRef]
26. Bouilheres, F.; Ha Le, L.T.V.; McDonald, S.; Nkhoma, C.; Jandug-Montera, L. Defining student learning experience through blended learning. *Educ. Inf. Technol.* **2020**, *25*, 3049–3069. [CrossRef]
27. Calderón, A.; Scanlon, D.; MacPhail, A.; Moody, B. An integrated blended learning approach for physical education teacher education programmes: Teacher educators' and pre-service teachers' experiences. *Phys. Educ. Sport Pedagog.* **2021**, *26*, 562–577. [CrossRef]
28. Al-Momani, M.M.; Pilli, O. The Impact of Integrated Mobile System on Students' Academic Achievement, Interaction and Satisfaction. *TEM J.* **2021**, *10*, 1395–1403. [CrossRef]
29. Gazica, M.W.; Leto, G.D.; Irish, A.L. The effects of unexpected changes to content delivery on student learning outcomes: A psychological contract perspective during the COVID-19 era. *Psychol. Sch.* **2022**, *59*, 1473–1491. [CrossRef]
30. Robson, L.; Gardner, B.; Dommett, E.J. The Post-Pandemic Lecture: Views from Academic Staff across the UK. *Educ. Sci.* **2022**, *12*, 123. [CrossRef]
31. Potra, S.; Pugna, A.; Pop, M.-D.; Negrea, R.; Dungan, L.; González-Zamar, M.-D.; Vázquez-Cano, E.; López Meneses, E. Facing COVID-19 Challenges: 1st-Year Students' Experience with the Romanian Hybrid Higher Educational System. *Int. J. Environ. Res. Public Health* **2021**, *18*, 3058. [CrossRef]
32. Lin, S.L.; Wen, T.H.; Ching, G.S.; Huang, Y.C. Experiences and challenges of an english as a medium of instruction course in taiwan during COVID-19. *Int. J. Environ. Res. Public Health* **2021**, *18*, 12920. [CrossRef] [PubMed]
33. Bedggood, R.E.; Donovan, J.D. University performance evaluations: What are we really measuring? *Stud. High. Educ.* **2012**, *37*, 825–842. [CrossRef]
34. Pye, G.; Holt, D.; Salzman, S.; Bellucci, E.; Lombardi, L. Engaging diverse student audiences in contemporary blended learning environments in Australian higher business education: Implications for Design and Practice. *Australas. J. Inf. Syst.* **2015**, 19. [CrossRef]
35. Nashaat, N.; Abd El Aziz, R.; Abdel Azeem, M. The Mediating Role of Student Satisfaction in the Relationship between Determinants of Online Student Satisfaction and Student Commitment. *J. E-Learn. High. Educ* **2021**, *2021*, 404947. [CrossRef]
36. Bashir, B.; Gani, A. Testing the effects of job satisfaction on organizational commitment. *J. Manag. Dev.* **2019**, *39*, 525–542. [CrossRef]
37. Mbwesa, J.K. Students' Perceived Quality of Distance Education Courses as a Correlate of Learner Satisfaction: A Case Study of the Bachelor of Education Arts Program, University of Nairobi, Kenya. *Int. J. Soc. Sci. Stud.* **2014**, *2*, 86. [CrossRef]
38. Parasuraman, A.; Zeithaml, V.A.; Berry, L. SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *J. Retail.* **1988**, *64*, 12–40.
39. Meyer, J.P.; Allen, N.J.; Smith, C.A. Commitment to organizations and occupations: Extension and test of a three-component conceptualization. *J. Appl. Psychol.* **1993**, *78*, 538–551. [CrossRef]
40. Fernandez-Lores, S.; Gavilan, D.; Avello, M.; Blasco, F. Affective commitment to the employer brand: Development and validation of a scale. *BRQ Bus. Res. Q.* **2016**, *19*, 40–54. [CrossRef]
41. Aravindan, K.L.; Thurasamy, R.; Raman, M.; Ilhavenil, N.; Annamalah, S.; Rathidevi, A.S. Modeling Awareness as the Crux in Solar Energy Adoption Intention through Unified Theory of Acceptance and Use of Technology. *Mathematics* **2022**, *10*, 2045. [CrossRef]
42. Hair, J.F.; Black, B.; Babin, B.; Anderson, R.E. *Multivariate Data Analysis*, 7th ed.; Prentice Hall: Upper Saddle River, NJ, USA, 2009.
43. Fornell, C.; Larcker, D.F. Structural equation models with unobservable variables and measurements error: Algebra and statistics. *J. Mark. Res* **1991**, *18*, 382–388. [CrossRef]
44. Schreiber, J.B. Core reporting practices in structural equation modeling. *Res. Soc. Adm. Pharm.* **2008**, *4*, 83–97. [CrossRef] [PubMed]
45. Wang, J.; Hefetz, A.; Liberman, G. Applying structural equation modelling in educational research. *Cult. Y Educ.* **2017**, *29*, 563–618. [CrossRef]

46. Hu, L.; Bentler, P.M. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Struct. Equ. Model. A Multidiscip. J.* **1999**, *6*, 1–55. [CrossRef]
47. Bagozzi, R.P. *Causal Models in Marketing*; John Wiley & Sons: New York, NY, USA, 1980.