Identifying Problems and Challenges in the Implementation of Blended Learning Instruction: Construction and Validation of a Scale for Teachers

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ABSTRACT

Purpose: The present paper aims on the construction and validation of a psychometric scale to identify the problems and challenges faced by the teachers in the adoption and implementation of blended learning instruction.

Design/Methodology/Approach: This paper focusses on the construction and the validation of a scale for the teachers from higher education in respect of the problems they face in the adoption and implementation of blended learning.

Findings: Exploratory factor analysis and Monte Carlo PCA were performed and the criteria for composite reliability, convergent validity and discriminant validity were checked. The final five-point Likert scale consisted of 13 items, administered on a representative sample of 100 teachers from higher education. Thus, the final questionnaire thus constructed has three dimensions (dimension 1=7 items, dimension 2= 3 items, and dimension 3= 3 items).

Originality/Value: The present scale was found valid and reliable and would be significant to identify and measure the problems and challenges faced by the teachers in the implementation of blended learning instruction in higher education institutions in Indian context.

Paper Type: Case Based Study

KEYWORDS: Blended Learning | Higher Education | Problems and Challenges | Teachers

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Introduction

Blended learning is gaining importance in the higher education system worldwide (Aisha & Panda, 2020; Picciano, 2006; Power, 2008; Picciano, 2009). The higher education institutions across the globe are now increasingly implementing blended learning and so the institutions are focussing on the design, development and implementation of blended learning instruction (Graham & Robison, 2007; Aisha & Panda, 2020; Aisha & Ratra, 2020b; Young, 2002). The reason of adopting blended learning can be many such as technological advancements, increasing demands of flexibility (Aisha & Ratra, 2020b; Oliver & Trigwell, 2005) or embracing innovations (Aisha & Ratra, 2020a; Orey, 2002), etc. However, the results of adopting blended learning have been undeniable which include increased efficiency and effectiveness (Aisha & Panda, 2020). Blended learning depends on the learning environments and the learning contexts (Oliver & Trigwell, 2005); thus, blended learning offers diverse strategies (Hinrichsen & Coombs, 2013; Graham, 2013; Garrison & Kanuka, 2004) to the teachers as well as the institutions; which makes it capable of catering the learning needs of the students (Mortera-Gutiérrez, 2006; Aisha & Ratra, 2020a; Garrison & Vaughan, 2008). Thus, for the quality development and effective implementation of a well-designed blended learning instruction teachers require well thought planning, proper decision-making, and effective utilization of resources, technology and infrastructure etc. (Graham, 2006; Ginns & Ellis, 2007; Mishra & Koehler, 2006; Aisha & Ratra, 2020a; Aisha & Ratra, 2020b; Ward & LaBranche, 2003). The results would be quality teaching-learning and students' learning experience (Aisha, 2020; So & Brush, 2008).

To achieve the results of quality teaching-learning and to offer quality learning experience to students' the teachers require to develop such a blended learning instruction (Reigeluth, 1999; Aisha & Ratra, 2020b). But, in this process good results can be achieved only if it is done willingly and there would be no problems and challenges in doing it all (Aisha & Panda, 2020; Aisha, 2020; Rossett & Frazee, 2006). Thus, in this context, the present paper intends to develop a psychometric tool to identify the problems and challenges faced by the teachers in the implementation process of blended learning instruction.

Objectives

The objective of the present study is to construct and validate an instrument that can identify problems and challenges faced by the teachers in the implementation of blended learning instruction. Therefore, subsequent steps taken for the development of an instrument to identify the problems and challenges of teachers in adopting and implementing blended learning has been described in this paper.

Method

For the construction of the scale a thorough review of literature has been done which led to the standardization process of the present instrument with the psychometrically defined dimensions which would be capable to identify the problems and challenges of teachers in adopting and implementing blended learning.

Therefore, in order to construct the present instrument, a pool of items related to the various domains through various resources were undertaken, which further handed over to 12 experts from the related fields and expertise, for their feedbacks and suggestions. The suggestions given by them were included and accordingly some of the items were deleted, and modified in order to enhance the content validity of the instrument. The modified tool was again given to the experts for their approval and thus, in this way the revised version of the scale contained 24 item statements based on Likert scale, which was considered to undergo further statistical process. The questionnaire on 5-point Liker-Scale carries marking as Strongly Disagree (SD)=1, Disagree (D)=2, Neutral (N)=3, Agree (A)=4 and Strongly Agree (SA)=5. The tool was then administered on a representative sample of 100 teachers (DeVellis, 1991; Mishra & Panda, 2007), and further, the present instrument was subjected to the statistical analyses.

Results

The statistical analyses began with analysing the reliability of the present instrument, the reliability coefficient Cronbach's alpha value was calculated to be .633 for 24 item statements. Further, item-total statistics was checked, the results showed that if four items viz., 7, 12, 22, and 23 get removed, the total coefficient Cronbach will get increased. Therefore, these four items were removed. Thus, at this stage, the number of items for the instrument consisted of 20 item statements, with a reliability coefficient Cronbach's alpha value =.702.

Exploratory Factor Analysis

For checking the number of factors, exploratory factor analysis has been conducted, for which the assumptions (Tabachnick and Fidell, 2007; Nunnally, 1978) for the factor analysis were checked and found to be met. The KMO statistics showed a value =.684; and the Bartlett's Test of Sphericity was observed significant. As, the KMO value should be greater than .50. Therefore, it suggested that the data met the factorability assumption for running EFA. Additionally, the Bartlett's Test of Sphericity showed a significant value which should be less than .05. The number of extracted factors by PCA was found to be three, as their Eigen values were found greater than 1. Furthermore, to prove the real number of factors a Parallel analysis has been applied. The results of the Monte Carlo PCA for Parallel

Analysis (PA) were checked. After comparing the extracted factors from factor analysis with Parallel Analysis results, it was confirmed that there were 3 factors (the value of factor 4 (1.3930) in the PA was greater than extracted value from the model (Factor 4=1.381). After fixing the number of factors, the new analysis of the KMO tests proved the factorability of the data (KMO>.50; BTS= <.05).

The measures for item communalities and the extracted variances (Beavers, et al, 2913; Brown, 2015) were checked. A scree plot of the finally extracted factors was also observed, where it was shown that there were three factors.

The pattern matrix with three factors were extracted, where, it was observed that under factor 1, seven items were loaded. Besides, under factor 2 and 3, three-three items were loaded respectively for both the factors. It was observed that five items were unloaded due to their low values. However, item 3 is loaded under factor 2 and 3 and item 1 is loaded under factor 1 and 3. Therefore, the subtraction of the values under each factor for item 1 and 2 showed that these items were showing an overlap and the items were deleted.

Construct Validity and Composite Reliability

After determination the number of factors, the composite reliability of the factors and AVEs were checked and the results of the convergent validity demonstrated that the CRs values for all factors were greater than .70. Therefore, the factors were establishing composite reliability. Furthermore, the AVEs were lower than .50 except for factor 2 which is higher than .50 (AVE=0.630291). The component correlational matrix showed that the rotation method as orthogonal. The results for discriminant validity showed that all 3 factors were establishing discriminant validity (SQRT AVE>.r). Thus, the finally extracted items were 13 items regarding teachers' problems & challenges. The final reliability coefficient Cronbach's alpha value was calculated to be .743, which is considered as good.

Discussion and Conclusion

The final scale with three factors or dimensions were extracted out after running factor analysis and MCPCA, which consisted of 13 items. And, the final reliability coefficient Cronbach alpha =.743; which is good and acceptable. The questionnaire is based on 5-point Likert-scale carrying marking as Strongly Disagree (SD)=1, Disagree (D)=2, Neutral (N)=3, Agree (A)=4 and Strongly Agree (SA)=5. The present questionnaire with three dimensions (dimension 1=7 items, dimension 2= 3 items, and dimension 3= 3 items) was found valid and reliable to study and identify the problems and challenges faced by the teachers in the adoption and implementation of blended learning instruction in higher education institutions in Indian context. The items were framed in a manner that the items would collect the responses about the status of various facilities, and capabilities of respondents, etc.; and a lack of such facilities, skills, capabilities and resources, etc would indicate the problems and challenges at the respondents' end. Therefore, it would be helpful in identifying the status of various resources, facilities and potentialities at teachers' end which would thereby be helpful in identifying their problems and challenges in the implementation of the blended learning programmes. Thus, the present scale to identify the problems and challenges faced by the teachers in adopting and implementing the teaching learning through blended learning showed satisfactory psychometric properties, with a proper scoring of the scale, as well as to the various dimensions have been determined. Further, demographic variables were appended to the instrument. Thus, the present scale will be helpful in identifying teachers' problems and challenges in adopting blended learning as high problems and challenges, average or moderate problems and challenges; and low problems and challenges, which thereby be helpful to educational administrators and policy makers and planners to manage change and implement blended learning. If problems and challenges were observed then proper communication and orientation through trainings and capacity building programmes may be provided to yield better results in adopting innovation like blended learning.

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Annexure 15.4.5

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30-Oct-2023	1338123 (DrillBit)	2502	17440

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10	scholarworks.waldenu.edu	<1	Publication
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7	ajssr.springeropen.com	1	Internet Data
8	www.mdpi.com	1	Internet Data
9	biomedcentral.com	1	Internet Data

Reviewers Memorandum

Reviewer's Comment 1: Great choice of the current topic and the decision to conduct a narrowly focused study that contributes fresh insights to the scientific literature by delving into the perspectives of teachers from higher education in respect of the problems they face in the adoption and implementation of blended learning.

Reviewer's Comment 2: Authors have attempted to structure this study quite well. But sample size could have been increased. It is difficult to generalise the result of 100 sample for the entire population. Although a good number of supportive existing literatures are provided in the study but recent literatures are missing.

Reviewer's Comment 3: The Exploratory factor analysis and Monte Carlo PCA were performed and the criteria for composite reliability, convergent validity and discriminant validity were checked. The paper offers a strong basis for further study in the area. Future studies can perform Confirmatory Factor Analysis on the same factors.

Citation

Conflict of Interest: Author of a Paper had no conflict neither financially nor academically.

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Editorial Excerpt

The article has 02% of plagiarism which is the accepted percentage as per the norms and standards of the journal for publication. As per the editorial board's observations and blind reviewers' remarks the paper had some minor revisions which were communicated on a timely basis to the authors (Noor & Amiteshwar), and accordingly, all the corrections had been incorporated as and when directed and required to do so. The comments related to this manuscript are noticeably related to the theme "**Identifying Problems and Challenges in the Implementation of Blended Learning Instruction**" both subject-wise and research-wise. The study intent to construct and validate a psychometric scale to identify the problems and challenges faced by the teachers in the adoption and implementation of blended learning instruction. Overall, the paper promises to provide a strong base for the further studies in the area. After comprehensive reviews and editorial board's remarks the manuscript has been categorized and decided to publish under "**Case Based Study**" category.

Acknowledgement

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