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Antecedents of Learner Engagement in Blended Learning: Survey Questionnaire Development and Content Validation Using Expert Review Technique

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Abstract: *Driven by the evolution of educational technology, blended learning has transformed into an innovative teaching technique in higher education characterized by distinct advantages including learner engagement. Empirical evidence suggests that learner engagement can lead to successful implementation and learner satisfaction. As such, blended learning environments can enhance students' engagement with learning materials, with other learners and with the facilitators. This study describes the development and face validation of a survey questionnaire to investigate antecedents of learner interaction and engagement towards blended learning with learner engagement as a mediator and instructor support as a moderator. Employing the Expert Reviews Method, a panel of experts analytically evaluated questionnaire items for content validity, sufficiency, clarity, coherence and relevance with the blended learning constructs.*

Findings indicate that the validated items in the questionnaire displayed strong content and face validity with the items closely aligned to the intended constructs of eLearning. Expert feedback contributed to refining the items' clarity and consistency, ensuring that each item accurately represented the conceptual domains it was designed to measure. The Content Validity Index (CVI) for all items ranged from 0.85 to 1.00, demonstrating expert agreement on item relevance and clarity. The average item validity of 92% and Kappa values (1.0000, 0.9192, 0.8486) display excellent inter-rater agreement. The results confirm that the instrument is a valid and reliable tool for evaluating key dimensions of eLearning environments, confirming that it effectively measures the constructs it was designed to assess in higher education settings.

Keywords: *Blended Learning, Learner Engagement, Questionnaire Development, Content Validation, Expert Review.*

1. INTRODUCTION

With the advancements of educational technology, blended learning offers novel prospects for teaching, learning and assessment (Waheeda et al., 2023) and has become a preferred delivery mode of teaching and learning in higher education today (Purnomo et al., 2022). Blended learning offers various benefits, such as improved learner interactivity and engagement, it can enhance the likelihood of successful implementation and learner satisfaction. As this mode of education continues to evolve, it becomes fundamental to ensure learner interactivity and engagement. Identifying the contributing factors and performance indicators of student engagement in blended learning becomes essential as they are uncertain in the current literature. To recognize these factors, well-developed survey instruments are necessary. On the contrary, the quality of the data acquired through the utilization of survey questionnaires rests on the validity, clarity and relevance of the questionnaire items. A frequently adopted strategy to improve the quality of survey instruments is the Expert Review Technique. This method requires seeking assistance from subject matter experts to assess the content validity, clarity and relevance, sufficiency of the items and the overall structure of the survey.

This paper aims to describe the application of this technique to develop and evaluate the survey questionnaire to examine the antecedents of learner engagement in blended learning. By following the process of Expert Review Technique and refining the instrument according to the experts' feedback, the study aims to ensure the questionnaire is theoretically sound and practically useful to assess students' interaction and engagement in blended learning experiences.

2. Questionnaire Development

Questionnaire development is one of the crucial aspects of research which is systematic and iterative to ensure the accuracy of the instrument to reflect the constructs it intends to measure. It refers to the process of development of consistent and valid measures of construct to weigh an attribute (Gunawan et al., 2021). While questionnaire development can have a direct impact on data collection (Taherdoost, 2022), it may comprise the process of identifying, planning, developing, piloting, implementing, analyzing, and reporting (Phakiti, 2013) categorized into two phased instrument construction and psychometric evaluation (Gunawan et al., 2021). Questionnaire development starts with a thorough literature review to recognize significant theoretical frameworks, earlier justified instruments, and significant variables correlated with the research objectives. This initial phase provides a thorough understanding of what should be assessed and advises on the development of applicable and significant survey items. According to Gunawan et al. (2021), questionnaire development comprises six steps as displayed in the following diagram (Fig. 1).

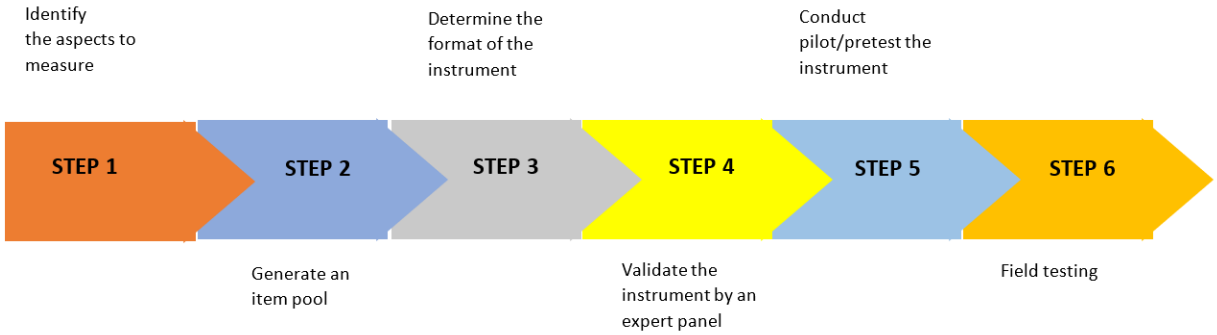

Fig 1. Instrument Development (Gunawan et al., 2021)

2.1. Step 1: Identify the aspects to Measure

The literature reviews on the antecedents of learner engagement and learner satisfaction towards blended learning comprises of several key factors manipulating learner engagement and satisfaction. Research indicates that learner engagement frequently performs as a mediating variable (Lin et al., 2023; Shin, 2023; Siddiqi, 2018) while instructor support may function as a moderating factor (ElSayad, 2023). Essential factors highlighted across the literature involve social presence (Abdul Rahman et al., 2021; Aliessa et al., 2024), teaching presence (Almasi & Zhu, 2020; Armah et al., 2023, 2023; Das & Madhusudan, 2023; ElSayad, 2023; Kucuk & Richardson, 2019; Tan, 2021 Singh et al., 2022; Nortvig et al., 2018), cognitive presence (Almasi & Zhu, 2020; Armah et al., 2023; ElSayad, 2023; Kucuk & Richardson, 2019; Tan, 2021) and learner presence (Edumadze & Govender, 2024). Further manipulating factors incorporate efficient learning design (Singh et al., 2022), learner interaction (Shin, 2023), and overall satisfaction (Zhang et al., 2024). Likewise, conclusions from Wang (2022) and Edwards and Konold (2020) emphasize the role of instructor support in moderated mediation models, and the mediating role of learner interaction and engagement. The theoretical underpinning of this research is the Community of Inquiry (CoI) model, which is extensively documented for modeling the dynamics of online and blended learning environments (ElSayad, 2023). Using the ARCS model of motivation (Keller, 1987) though the constructs of it, such as attention, relevance, confidence, and satisfaction, are not directly used in the conceptual framework, it offers contextual insight into the motivational aspects relevant to learner engagement and satisfaction. To examine the antecedents of learner engagement in blended learning, a conceptual framework was developed and with cognitive presence, social presence, teaching presence, learner presence and learning design as independent variables, interaction and engagement as a mediating variable and instructor support as a moderating factor while learner satisfaction is proposed as a dependent variable.

Social Presence in this study refers to the learner's ability to project themselves socially and emotionally in a learning environment to foster a sense of belonging. It encompasses the concept of communication and

interaction with peers, including asking questions, engaging in discussions and negotiating their perspectives, as well as expressing their ideas and opinions. Social Presence is comprised of three sub-dimensions.

- Effective expression which seeks to know course participants,
- Open communication helps to build trust and comfort, and
- Group cohesion is to sustain community sense for collaboration and share their understanding.

Cognitive Presence is the extent to which learners construct and apply meaning through reflection and discourse as well as the acquisition of knowledge and practical application of knowledge. It consists of 4 sub-categories, triggering events where learners recognize and define problems, an exploration involves investigating and discussing ideas with peers. The subcategory, integration refers to the process of learners synthesizing and constructing meaning from discourse while resolution is the application of newly constructed knowledge through problem-solving. Teaching Presence describes the role of the instructor in guiding and supporting learning. It includes the interactions from the instructor to the learners and the discussion between them. Teaching presence consists of three core elements: instructional design, discourse facilitation and direct instruction. Instructional design includes designing course content and teaching approaches. Discourse facilitation involves facilitating students to comprehend learning content, encouraging their thinking, supporting their participation, keeping them on tasks and developing a sense of community. Direct instruction includes providing feedback, clarifications, and expert input. Learner Presence focuses on learner's self-regulation, encompassing motivational, behavioral and metacognitive aspects. This reflects how learners manage their own learning process and actively participate in the learning environment. Instructor Support is operationalized as the active engagement of instructors with the learners including delivering feedback, providing clear instructions, and offering cognitive and emotional support to create a supportive learning environment, providing motivation and encouragement to the learner. Learning Design comprises multiple elements aimed at facilitating effective learning including content design, assessment strategies, feedback mechanisms, visual and media design, and intuitive navigation. These components work together to help learners acquire the knowledge and skills needed to achieve learning outcomes. Learner Interaction and Engagement is operationalized through the interactions and activities that occur among learners, between learners and instructors, and between learners and content. These interactions foster active engagement in the learning process. Learner Satisfaction is identified as the learner's overall satisfaction and contentment with the blended learning experience. It reflects their perception of quality of interaction, flexibility of the learning environment and their own performance and achievement.

2.2. Step 2: Generating/Adapting an Item Pool

In order to test these hypotheses an item pool must be generated. In general, item generation is carried out either by creating questions or statements or by adapting items from other relevant instruments. The items that are generated or adapted must exhibit individual constructs or sub-dimensions and can be both open-ended or closed- ended questions and statements and are normally developed as surveys for quantitative analysis. Regarding the instrument for this study, it was found from the literature that a comprehensive and thorough instrument has yet to be developed to measure all the constructs of this study. Although the existing instruments include some of the elements of this study, they do not provide all key constructs comprehensively. Therefore, components to measure different constructs in different instruments are compared and the most appropriate pool of items were adapted. Items for the variable Teaching Presence, Cognitive Presence, Social Presence and Learner Presence were adapted from ElSayad (2023). Cognitive Presence comprises 11 items while Social Presence consists of 7 items, Teaching Presence includes 9 items and Learner Presence consists of 9 items evaluated on a 5-point Likert scale. Items of Learning Design are adapted from Al-Fraihat et al. (2020), Lewis et al. (2020) and consist of 12 statements and learner Interaction & Engagement items are adapted from the research of Lee et al. (2019) with 8 items. Also, Instructor Support items are taken from Walker (2003) and Learner Satisfaction from Nyathi and Sibanda (2023). It is preferred to use existing items from previous research since they are most valuable as those items already have an item analysis and their usefulness has been established (Peter et al., 2017).

2.3. Step 3: Instrument Format

Also, the questionnaire consists of the research title, clear instructions for each section, the concepts and items for each construct and a thank you statement as mentioned by Phakiti, (2013). The survey questionnaire is divided into two main parts; part A, the demographic information which consists of 5 questions including gender, age, level of blended course enrolled, blended learning experience and employment status. Part B of the instrument includes items related to the constructs measured in a 5point Likert scale from 1, strongly agree to 5, strongly disagree (Taherdoost, 2022). These items are adapted from tested and validated instruments.

2.4. Step 4: Instrument Validation (by an Expert Panel)

After the questionnaire development, the next step is questionnaire validation and is referred to as content validation/face validation. Expert opinion is an approach widely recognized for enhancing validity and reliability of survey instruments specifically in educational research (Peter et al., 2017). The primary objective of this instrument validation is to ensure that the questionnaire accurately reflects the constructs of learner engagement in blended learning and elicits meaningful responses. Also, to evaluate the appropriateness of each item within the questionnaire, the alignment with the goals of the study reflects the current understanding of the field of blended learning. This process involves Subject Matter Experts (SME's) evaluation of the items for their relevance, clarity, sufficiency and coherence to each construct. The activities taken in this process are displayed in the following fig (Fig. 2) and are categorized into 5 actions.

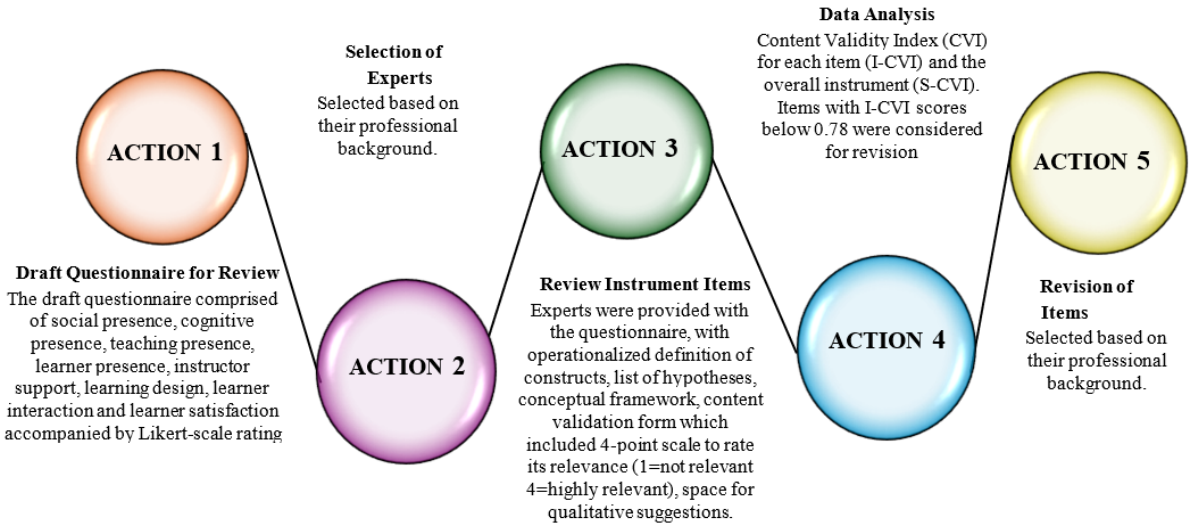

Fig. 2. Actions Taken for Instrument Validation

2.5. Action 1: Draft Questionnaire for Review

The first action, draft questionnaire for review, is the process of developing the questionnaire for content/face validation by an expert panel. In this questionnaire there are two sections which comprise demographic information and questions related to the actual research. Demographic information included subject matter experts' field of expertise (content expert/research expert/education expert or both), experience, designation and education level are included and in the second section questions related to teaching presence, cognitive presence, social presence, learner presence, learning design, instructor support, interaction and engagement and learner satisfaction. As seen from the sample in Fig. 3, the operational definition of the concepts is included followed by the statements which reflect those constructs. A 4-point rating scale was developed in which 1= not relevant, 2=somewhat relevant, 3=quite relevant and 4=highly relevant (Peter et al., 2017).

2.6. Action 2: Selection of Experts

The second action was the selection of experts based on their professional background. Experts from three different areas of content (blended learning/eLearning/ instructional designing), research and education

were included in this study. They were invited to participate based on their experience in higher education/teaching and research related to eLearning and blended learning. The number of experts required for instrument validation varies from 2 to 20 individuals according to different sources. At least 5 people are suggested by Zamanzadeh et al. (2015). In this study, a panel of 13 experts was purposely selected based on their educational background, research and teaching experience, and they were requested to review the survey items.

2.7. Action 3: Review of Instrument

Review of instrument items was the third action. The experts were provided with the questionnaire, operationalized definition of constructs, list of hypotheses, conceptual framework and content validation form which included a 4-point scale to rate its relevance (1=not relevant 4=highly relevant) and space for qualitative suggestions. They were requested to provide comments based on the sufficiency, clarity and coherence of the items other than rating the relevance of the items.

2.8. Action 4: Data Analysis

Qualitative comments were analyzed thematically to identify common suggestions and critiques. The qualitative feedback and suggestions provided by experts (Gunawan et al., 2021) are displayed in the following table (Table 1).

Table 1. Experts' Comments on the Instrument Items

Experts		Comments
Expert 13	Social Presence SP-OC1	The word 'Conversing'- "maybe can use a common term".
Expert 13	Cognitive Presence CP-TE2	The word "piqued'- "may be a common term".
Expert 13	Learner Presence LP-DE2	"May be shortened".
Expert 10	Learner Presence LP-DE2	Too long
Expert 4	Learner Presence LP-DE2	Hinted that it is too long by putting an asterisk
Expert 7	Learner Presence LP-DE2	Commented "Can they comprehend?"
Expert 13	Learning Design LD-MD1	'Multimodal presentations'- "may include in brackets with examples (videos, animations etc.")
Expert 13	LD-VD2 LD-NV1	Showed the word Module typed instead of Moodle.
Expert 10	LD-NV1	Can break down
Expert 13	Learning Design Ideas given	Maybe this section can include an item related to learning pathways customized to learner progress. Also, an item related to the use of interactive tools/tech to present content. Mechanisms were established to monitor learning.
Expert 10	Teaching Presence TP-D13	Too long
Expert 7	Topic	The 'HEI'- in the topic to write in full as 'Higher Education Institutions'.
Expert 7	Teaching Presence TP-FD2	Underlined the words "helped keep…"
Expert 7	Teaching Presence	Underlined the words "helped make…"

Experts		Comments
	TD-DI1	
Expert 7	Teaching Presence TD-DI3	Asked whether explanations and examinations are the same or different. Commented that there are two points in one sentence.
Expert 7	Learner Presence LP-BH2	Suggested to use "am able to keep up/can keep up" instead of 'I keep up…'.
Expert 7	Instructor Support INS-MS2	Commented saying "How about writing this separately?"
Expert 7	Learning Design LD-CD4	Commented saying "do all institutions use Moodle or Learning Management Systems?"
Expert 7	Learning Design LD-AF1	Suggested to use 'learner friendly' instead of 'interactive modules with measurable progress."
Expert 4	Cognitive presence CP-IN1	Suggested to add 'the' in ….in course activities.
Expert 4	Teaching presence TP-DO2	Suggested to add 'the' in …participate in course.
Expert 4	Teaching presence TP-FD1	Suggested deletion '…and participating…"
Expert 4	Learning Design LD-CD1 & LD-CD4	Suggested to change 'in' in both sentences to 'on'.
Expert 5	Cognitive presence CP-TE1, CP-EX1,	Suggested to change 'in' in both sentences to 'on'.
Expert 4	Learner Satisfaction	Suggested to use the word eLearning consistently LS2, LS3, LS4.
Expert 5	Cognitive presence CP-TE1, CP-EX1,	the word 'problems' and 'course issues' circles to show the suggestion to change.
Expert 5	Learner Presence Suggestion	Learners need to reflect on their own progress as well (not only teachers feedback) (self-assessment and evaluation.
Expert 5	Learner Presence INS-CI1	Suggesting that faculty should answer the question.
Expert 5	Learning Design LD-CD3	Suggested to use 'complete' instead of 'sufficient'.

2.9. Content Validity Index

The quantitative data gathered was used to calculate the Content Validity Index (CVI) for each item (I-CVI) and the overall instrument (S-CVI). According to Yusof (2019), the suitable Content Validity Index (CVI) values differ based on the number of experts involved in the evaluation: a minimum of 0.80 is satisfactory when two experts are involved; a CVI of 1.00 is compulsory for evaluations involving three to five experts; at least 0.83 is adequate with six to eight experts; and a minimum of 0.78 is considered satisfactory when nine or more experts participate in the evaluation.

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Questionnaire - Content Validation

Antecedents of learner engagement and learner satisfaction towards blended learning among learners in HEIs in Maldives. Learner engagement as a mediator: a moderated mediation model

Dear Experts,

This questionnaire contains 8 domains, and 69 items related to eLearning. Your expert judgment is required on the degree of relevance of each item to the measured domain and the sufficiency, clarity, coherence of each item. Your review should be based on the definitions, terminologies, conceptual framework and the hypothesis that are provided.

Section A: Complete the following information related to your expertise, education and employment.

Content Expert ☐ Research Expert ☐ Education Expert ☐
Years of experience in the field .....
Designation: .....
Education: .....

Section B: Read the following statements/questions and indicate your view by rating the degree of relevance to the measured domain. Also, could you please provide comments and suggestions on sufficiency, clarity, and coherence of the items near or on the margin.

1= not relevant, 2= somewhat relevant, 3=quite relevant, 4=highly relevant
Please comment on sufficiency, clarity, coherence, and relevance

Social Presence includes the concept of communication and interaction with peer learners, asking questions, discussing and negotiating their perspectives, expressing their ideas and opinions to foster their belonging. It consists of three sub-dimensions, affective expression which seeks to know course participants, open communication helps to build trust and comfort, and group cohesion is to sustain community sense for collaboration and share their understanding. 1= not relevant, 2= somewhat relevant, 3=quite relevant, 4=highly relevant		1	2	3	4
SP-AE1	Getting to know other course participants gave me a sense of belonging in the course.	☐	☐	☐	☐
SP-AE2	I was able to form distinct impressions of some course participants.	☐	☐	☐	☐
SP-OC1	I felt comfortable conversing through the online medium.	☐	☐	☐	☐

Fig 3. A sample from Content Validation Questionnaire

Items with I-CVI scores below 0.78 were considered for revision based on Lynn's (1986) recommended threshold for content validity. The following formula was utilized to calculate the I-CVI scores.

$$\text{I-CVI} = \frac{\text{Number of expert ratings 4 or 4}}{\text{Total number of Experts}}$$

As 13 experts evaluated the questionnaire, 0.78 can be considered satisfactory in this study. The Content Validity Index of the items varies from 1 to 0.92 to 0.85 and no item was below 0.8. as seen from Table 2. Therefore, all items can be considered satisfactory.

The average S-CVI is calculated using $\text{I-CVI} = \frac{\text{Number of I-CVIs}}{\text{Number of Items}}$ S-CVI/Ave = 64/69 = 0.92.

This means that 92% of the experts agreed on the relevance of the items and this is considered as excellent (Lynn's, 1986).

Table 2. Content Validity Index of Questionnaire Items

Questionnaire Items	R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10	R 11	R 12	R 13	Sum	CVI
Social Presence															
SP-AE1	4	4	4	4	3	4	4	4	3	4	4	4	4	50	1.00
SP-AE2	4	2	2	3	3	4	4	4	3	4	3	3	4	43	0.85
SP-OC1	4	4	4	4	3	4	4	4	3	4	4	3	4	49	1.00
SP-OC2	4	4	4	4	3	4	4	4	3	4	4	4	4	50	1.00
SP-OC3	4	4	4	4	3	4	4	4	2	4	4	4	4	49	0.92
SP-GB1	4	4	4	4	3	4	4	4	3	4	4	4	4	50	1.00
SP-GB2	4	3	4	4	3	4	4	4	3	4	4	4	4	49	1.00
Cognitive Presence															
CP-TE1	4	4	4	4	3	4	4	4	4	4	3	4	4	50	1.00
CP-TE2	4	4	4	3	3	4	4	4	3	4	4	4	4	49	1.00
CP-TE3	4	4	3	3	3	4	4	4	2	4	4	3	4	46	0.92
CP-EX1	4	2	4	4	3	4	4	4	3	4	4	4	4	48	0.92
CP-EX2	4	4	4	4	3	4	4	4	3	4	4	4	4	50	1.00
CP-EX3	4	4	3	3	3	4	4	4	3	4	4	4	4	48	0.85
CP-IN1	4	4	4	4	3	4	4	4	3	4	4	4	4	50	0.85
CP-IN2	4	4	4	4	3	4	4	4	3	4	4	4	4	50	0.85
CP-RE1	4	4	3	3	3	4	4	4	3	4	4	4	4	48	0.85
CP-RE2	4	4	3	3	3	4	4	4	2	4	4	4	4	47	0.92
CP-RE3	4	4	4	4	3	4	4	4	2	4	4	4	4	49	0.92
Teaching Presence															
TP-DO1	4	3	4	3	3	4	4	4	1	4	4	4	4	46	0.92
TP-DO2	4	3	3	4	3	4	4	4	1	4	4	4	4	46	0.92
TP-DO3	4	4	4	3	3	4	4	4	1	4	4	4	4	47	0.92
TP-FD1	4	4	4	4	3	4	4	4	1	4	4	4	4	48	0.92
TP-FD2	4	4	3	4	2	4	4	4	1	4	4	4	4	46	0.85
TP-FD3	4	4	4	4	2	4	4	4	1	4	4	4	4	47	0.85
TP-DI1	4	4	3	4	3	4	4	4	1	2	4	4	4	45	0.85
TP-DI2	4	4	4	4	3	4	4	4	1	4	4	4	4	48	0.92
TP-DI3	4	4	4	4	3	4	4	4	1	4	3	4	4	47	0.92
Learner Presence															
LP-MO1	4	4	3	3	3	4	4	4	3	4	4	4	4	48	0.92
LP-MO2	4	4	3	3	2	4	4	4	3	4	4	4	4	47	0.92
LP-BH1	4	4	4	4	3	4	4	4	3	4	4	4	4	50	0.92
LP-BH2	4	4	2	4	2	4	4	4	3	4	4	3	4	46	0.85

Questionnaire Items	R 1	R 2	R 3	R 4	R 5	R 6	R 7	R 8	R 9	R 10	R 11	R 12	R 13	Sum	CVI
LP-BH3	4	4	3	4	2	4	4	4	3	4	4	4	4	48	0.92
LP-BH4	4	3	3	4	2	4	4	4	3	4	4	4	4	47	0.92
LP-DE1	4	4	4	3	2	4	4	4	3	2	3	4	4	45	0.85
LP-DE2	4	4	3	3	3	4	4	4	3	2	2	4	4	44	0.85
LP-DE3	4	4	4	4	3	4	4	4	3	4	4	4	4	50	1.00
Instructor support															
INS-CI1	4	4	4	4	2	4	4	4	3	4	4	4	4	49	0.92
INS-CI2	4	4	3	4	2	4	4	4	3	4	4	4	4	48	0.92
INS-IC1	4	4	3	4	2	4	4	4	3	4	4	4	4	48	0.92
INS-IR1	4	3	3	4	3	4	4	4	3	4	4	4	4	48	1.00
INS-IR2	4	4	4	4	2	4	4	4	3	4	4	4	4	49	0.92
INS-IR3	4	4	4	3	3	4	4	4	3	4	4	4	4	49	1.00
INS-MS1	4	4	4	4	2	4	4	4	3	4	4	4	4	49	0.92
INS-MS2	4	4	4	4	3	4	4	4	3	4	4	4	4	50	1.00
Learning Design															
LD-CD1	4	4	4	2	2	4	4	4	3	4	4	4	4	47	0.85
LD-CD2	4	4	4	2	3	4	4	4	3	4	4	4	4	48	0.92
LD-CD3	4	4	4	3	2	4	4	4	3	4	4	4	4	48	0.92
LD-CD4	4	4	4	3	2	4	4	4	3	4	4	4	4	48	0.92
LD-CD5	4	4	4	3	2	4	4	4	3	4	4	4	4	48	0.92
LD-AF1	4	4	2	3	2	4	4	4	3	4	3	4	4	45	0.85
LD-AF2	4	4	3	3	3	4	4	4	3	4	3	4	4	47	1.00
LD-MD1	4	4	4	4	3	4	4	4	3	4	4	4	4	50	1.00
LD-VD1	4	4	4	3	2	4	4	4	3	4	4	4	4	48	0.92
LD-VD2	4	4	4	3	2	4	4	4	2	4	4	4	4	47	0.85
LD-NV1	4	4	4	4	2	4	4	4	3	2	4	4	4	47	0.85
LD-NV2	4	4	4	4	2	4	4	4	3	4	4	4	4	49	0.92
Learner Interaction & Engagement															
LIE-LL1	4	4	3	3	2	4	4	4	3	4	4	4	4	47	0.92
LIE-LL2	4	4	3	3	2	4	4	4	3	4	4	4	4	47	0.92
LIE-LL3	4	4	1	4	3	4	4	4	3	4	4	4	4	47	0.92
LIE-LL4	4	4	2	4	3	4	4	4	3	4	4	4	4	48	0.92
LIE-LL5	4	4	3	4	3	4	4	4	3	4	4	4	4	49	1.00
LIE-LF1	4	1	4	4	3	4	4	4	3	4	4	4	4	47	0.92
LIE-LF2	4	4	4	4	2	4	4	4	3	4	4	4	4	49	0.92
LIE-LF3	4	1	4	4	2	4	4	4	3	4	4	4	4	46	0.85
LS-01	4	4	4	3	3	4	4	4	3	4	4	4	4	49	1.00
LS-02	4	4	4	3	3	4	4	4	3	4	4	4	4	49	0.92
LS-03	4	4	4	4	3	4	4	4	3	4	4	4	4	50	0.92
LS-04	4	4	4	4	3	4	4	4	3	4	4	4	4	50	0.92
LS-05	4	4	4	4	3	4	4	4	3	4	4	4	4	50	0.92

To strengthen the CVI analysis the inter-rater agreement beyond chance, the Modified Kappa statistic (K*) was calculated for each item based on the item level content validity indices using rating from 13 experts using the formula.

$$P_c = \frac{N!}{A!(N-A)!} \times 0.5^N$$

Where:

- N = total number of experts
- A = number of experts rating the item as relevant (3 or 4)
- 0.5N= probability of random agreement
- N! A! etc. = factorials

$$\kappa^* = \frac{\text{I-CVI} - P_c}{1 - P_c}$$

Table 3. Modified Kappa Values

I-CVI	*Experts Rated Relevant (A)*	*Kappa (K*)*	*Interpretation*
1.00	*13*	*1.0000*	*Excellent Agreement*
0.92	*12*	*0.9192*	*Excellent Agreement*
0.85	*11*	*0.8486*	*Excellent Agreement*

The K* values for the items were 1.0000, 0.9192 and 0.8486 which are within the range of excellent agreement (Polit et al., 2007), indicating a high level of consistency among the expert reviewers. This high level of inter-rater reliability means that the likelihood that this agreement happened by chance is very low. Therefore, these findings of this Expert Review support the content validity of the research instrument, indicating that the items are evidently agreed and consistently rated as relevant by subject matter experts.

2.10. Action 5: Revision of Items

Based on the expert feedback, several items were reworded, (LD-CD3, CP-TE1, CP-EX1, LP-BH2, TD-DI1, TP-FD2, CP-TE2, SP-OC1), some items that were too long or have two constructs were divided into two items (INS-MS2, TD-DI3, TP-D13, LD-NV1, LP-DE2), and other suggestions and comments were taken into consideration and the items were revised. The revised questionnaire was then finalized to use in the pilot testing phase.

3. CONCLUSION

Learner satisfaction is a multidimensional construct in a blended learning environment. Empirical evidence suggests the significance of learner interactivity and the impact on individual's satisfaction. Hence the relevance of measuring it is justified. Understanding the correct tool development methodology is vital to develop an appropriate instrument which can be valid and reliable to evaluate such an environment. This study describes the development and face validation of a survey questionnaire to investigate antecedents of learner interaction and engagement towards blended learning with learner engagement as a mediator and instructor support as a moderator.

Content validity is vital to ensure the overall validity of an assessment, therefore a systematic approach for content validation should be done based on the evidence and best practice. This paper has provided a systematic and evidence-based approach to conduct proper content validation. Employing the Expert Reviews Method, a panel of experts in teaching, educational technology and instructional design analytically evaluated the questionnaire items for content validity, sufficiency, clarity, coherence and relevance with blended learning constructs. This process incorporated both qualitative comments and feedback and quantitative scores to improve the questionnaire items. The validation process confirmed that the questionnaire is a robust instrument for assessing mobile learning within technology-enhanced learning environments. All items demonstrated strong content and face validity, with I-CVI values ranging from 0.85 to 1.00 and no item falling below the acceptable threshold. The average item agreement of 92% and Kappa values of 1.0000,

0.9192, and 0.8486 indicated excellent inter-rater reliability. Expert feedback further enhanced item clarity and relevance, ensuring alignment with the conceptual domains. These results affirm the instrument's capacity to accurately capture key constructs and support its use in future educational research and practice.

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