Development and Validation of Critical Reading Intention Scale (CRIS) for University Students using Exploratory and Confirmatory Factor Analysis

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Abstract: Critical reading is a crucial skill that students should acquire upon completion of higher education to obtain employment opportunities. However, their level of critical reading skills has been reported to be unsatisfactory. This study aims to address this issue by developing and validating an instrument that examines the factors that influence students' intention to participate in critical reading. The theory of planned behaviour was employed to develop an instrument for the Critical Reading Intention Scale (CRIS) to gain a deeper insight on this issue. This cross-sectional study collected 120 responses for a pilot study which were subjected to exploratory factor analysis (EFA) using SPSS. Findings from the EFA suggested one item to be deleted. Subsequently, 220 responses were gathered from the actual data collection, and the data were subjected to confirmatory factor analysis (CFA) using AMOS. The results concluded that CRIS instrument fulfils the requirements in CFA and is valid for measuring students' intention to participate in critical reading. CRIS is useful to identify the enablers and difficulties that influence students' intention in critical reading and for relevant stakeholders to take necessary steps to remedy students' unsatisfactory critical reading performance and create an environment that fosters critical reading skills.

Keywords: Confirmatory factor analysis, Critical reading, Exploratory factor analysis, Intention, Theory of planned behaviour

1. Introduction

The importance of critical thinking has been emphasised by the government and heightened by the need for the skill in the global job market. In the Future of Jobs Report by the World Economic Forum (2018), critical thinking skill is noted as a human skill that will not only maintain its prominence but also escalate in value. The report also notes the skill as an emerging skill that employers tend to search for in graduates. Yet, as reported in The Malaysian Education Blueprint 2015–2025 (Higher Education), graduates have been noted by potential employers as lacking in critical thinking skills. Such shortcoming has led to the lack of such skills becoming a global concern. The blueprint also notes critical thinking skills as an aspiration for students to achieve upon completion of higher education.

Central to the discipline of critical thinking is critical reading. Smith (1977) characterises reading as an imperative process of encouraging critical thinking. This view is supported by Marin and de la Pava (2017), who stressed that critical reading is crucial in language learning. Critical reading is a process that employs critical thinking skills (Douglas, 2000; Thistlethwaite, 1990) and involves readers (Marschall and Davis, 2015). According to Marschall and Davis (2015), as the readers read, they would engage and dialogue with (the writer of) a text, question, analyse, interpret, and evaluate the content and structure of the written text, and make connections between the text and their lived experiences. Students with critical reading skills would be able to analyse, synthesise, and evaluate information in a text if they acquired critical reading skills from an earlier stage (Abd Kadir et al., 2014).

Mohd Zin et al. (2014) investigated the level of critical reading skill, specifically analytical and inference skills, among university students. A reading comprehension test was administered to both low-proficiency and high-proficiency groups to determine their level of critical reading skill. The findings indicate that while the students could understand the text, they lack the ability to analyse and evaluate the written material. In the same vein, Seng and Zainal (2017) found that the students in their study were able to respond critically to a text they read moderately. Similar results were reported by Sidhu et al. (2015) who found that supervisors from Malaysia view Malaysian students as possessing moderate critical reading abilities. Gorzycki et al. (2016) explored students' critical reading performance using critical reading exercises and characterised teachers' and students' perceptions and attitudes towards critical reading and reported consistent findings as other scholars. In their study, the analysis from both surveys and test scores indicated that students overestimated their critical reading abilities. The study, however, did not clarify the factors contributing to the mismatch between the students' and teachers' scores of perceived level of critical reading skill and scores from the reading tests.

Various studies have argued that students' possessing superficial critical reading abilities are attributable to the didactic nature of their learning process (Muhammad, 2007; Kaur & Sidhu, 2014; Koo. Y. L. et al., 2012). Reading anxiety was found by Rahmat et al. (2020) and Koo et al. (2003) as a significant contributor to students' moderate critical reading ability. Another factor highlighted by Halim et al. (2020) and Baba and Affendi (2020) is students' inability to understand the essence of an academic text due to its complexity. The moderate level of critical reading ability reported by Anuar and Sidhu (2017) and Mohd Zin et al. (2014) was also attributable to educators' tendency to focus on fluency and comprehension skills rather than critical reading skills (Muhammad, 2007; Abd Kadir et al., 2014).

The literature also accentuates critical reading as an issue requiring further examination. Unsatisfactory critical reading performance is perceived as unfavourable because effective critical reading skills are required to develop students into critical thinkers. Also, limited studies have examined the critical reading skills of Malaysian students and the determinants that influence their critical reading performance. To produce graduates who are critical readers hence critical thinkers, as stipulated in the Malaysia Education Blueprint 2015–2015, it is essential to investigate the factors that contribute to the intention that affects their critical reading performance.

An appropriate framework for measuring students' intention to participate in critical reading is the theory of planned behaviour (TPB). Developed by Ajzen (1991), the TPB is a revision of the theory of reasoned action (TRA). The TBP proposes that intention be viewed as the nucleus to motivate individuals to perform a specific behaviour (Ajzen, 1991). To examine the efficacy of the TBP, Armitage and Conner (2001) conducted a meta-analytic review of 185 independents studies and concluded that the theory is excellent for predicting intention with a multiple correlation of 0.63. The framework was also found to be accounted for 39 percent of the variance in intention, which is categorised as large by Cohen (1992). In another study, Tolma et al. (2006) emphasises TPB as a framework that creates a more comprehensive understanding of the influencing predictors of an individual's intention and behaviour. Accordingly, the TBP was used as the underpinning theory in the development of the Critical Reading Intention Survey (CRIS).

The TBP suggests that the intention to participate in critical reading is influenced by three main predictors: attitude, subjective norm, and perceived behavioural control. In this study, attitude is defined as a student's overall judgement of critical reading skills. Subjective norm is taken as a student's perception of the social pressure to participate in critical reading, while perceived

behavioural control is characterised as a student's belief about his or her ability to participate in critical reading. It is essential to model the influence of these predictors on intention, as intention will directly contribute to a more positive critical reading behaviour.

This study extends the TBP by incorporating three salient beliefs to develop a more reliable instrument for measuring the influence of attitude, subjective norm, and perceived behavioural control on intention. These beliefs were incorporated in the development of the CRIS as there has been little discussion about the influence of these beliefs in the critical reading context. Salient beliefs are defined as information elicited from students about participating in critical reading. Included in the development of CRIS, are the three salient beliefs of behavioural belief, normative belief, and control belief. Behavioural belief is referred to as the perceived consequences of participating in critical reading from the students' perspectives, which influence students' attitude towards participating in critical reading. The second salient belief is normative belief that influences the subjective norm construct. Normative belief refers to the perception of significant others' preferences whether a student should participate in critical reading. Finally, control belief is defined as the likelihood that a student possesses the resources and opportunities necessary to participate in critical reading. This factor influences perceived behavioural control. The relationships among these constructs are illustrated in Figure 1.

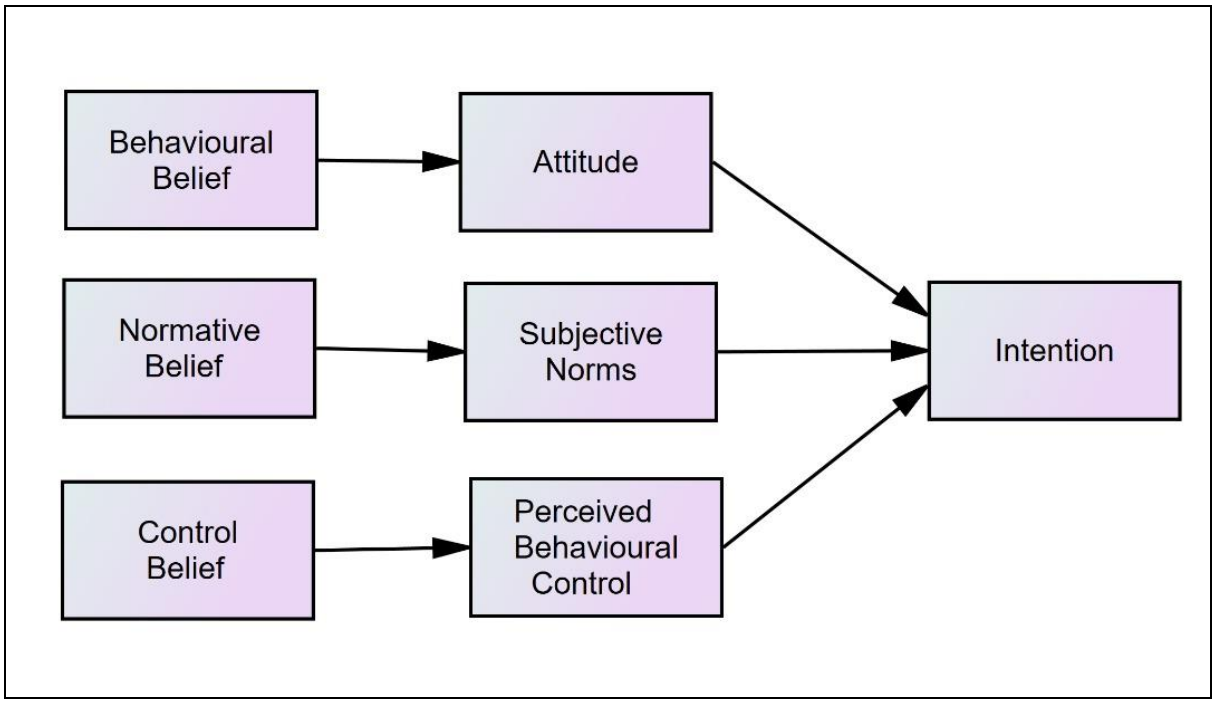

Fig. 1 Theoretical Framework

Oluka et al. (2014) conducted a systematic review of the questionnaire development process in ten studies related to TBP. They found that salient beliefs should be incorporated to determine the influence of these factors towards intention more comprehensively. These salient beliefs, according to Miesen (2003), are essential in determining literary intention and reading behaviour. The multiple regression analysis revealed that behavioural belief has the highest influence on intention through attitude. The findings, nevertheless, require an updated study to render them more applicable in today's context. Despite the importance of these beliefs, their influence is often underestimated by many scholars (Darker et al., 2007). Adding the three constructs to a survey instrument will address the gap in the literature of critical reading and TBP, as the influence of these factors altogether remains unclear. Also, minimal studies have developed a validated instrument for measuring students' intention to participate in critical reading.

Therefore, the current study intends to develop and validate a survey questionnaire termed CRIS. This instrument could be employed to identify the factors influencing students' critical reading intention. CRIS also provides an opportunity to advance our understanding of the barriers and enablers that affect students' intention to participate in critical reading.

2. Methodology

This study adopted a cross-sectional research design whereby data were collected at one point over a period (Sekaran & Bougie, 2016). Data for the pilot and actual studies were collected from a language faculty in a public university in Malaysia. Simple random sampling was employed to select respondents among the final-year students. The items for attitude, subjective norms, and perceived behavioural control were adapted from the literature. The items for behavioural belief, normative belief, and control belief were developed based on an elicitation survey—a method recommended by Francis et al. (2004) and Sutton et al. (2017) in constructing a TPB-based survey instrument. The elicitation survey examined 27 surveys, which exceeded the recommended minimum number of 25 (Francis et al., 2004).

A pre-test was first conducted to ensure the content validity, face validity, criterion validity of the CRIS for the actual fieldwork. The content validity of CRIS was assessed by two content experts who were academicians and have taught critical reading courses for more than 10 years. The criterion validity of CRIS was assessed by a statistical expert to ensure that the scale used was appropriate. Subsequently, the CRIS was submitted to a certified translator for back-to-back translation from English to Malay (Bahasa Malaysia) to establish face validity. Once the validation procedure was completed, CRIS was pre-tested on 10 randomly selected respondents to gauge the consistency of their responses and to receive feedback on any ambiguous terms, the clarity of the questions, and the questionnaire design. These issues were identified and addressed before the pilot study and actual fieldwork (Zikmund & Babin, 2010). After the instrument was revised based on the comments by the panel of experts and pre-test, a pilot study was conducted, and 120 valid responses were obtained thus fulfilling the required minimum sample size of 100 (Awang, 2015; Bahkia et al., 2019). The pilot study data were subjected to exploratory factor analysis (EFA) before the actual survey. The results of the EFA are presented in Section 3.1.

The finalised version of the CRIS instrument consisted of 30 items, excluding questions on the respondents' demographic profile. A 10-point interval scale ranging from 1 (*strongly disagree*) to 10 (*strongly agree*) was employed for the instrument. This interval scale was recommended by Awang (2015) and Coelho and Esteves (2007) to ensure that the data obtained from CRIS are more independent. The actual survey obtained 232 responses whereby 220 responses were found to be valid. Statistical Package for Social Science (SPSS) and Analysis of Moment Structures (AMOS) were utilised to analyse the data. SPSS was used for data screening and the EFA. AMOS was used to validate the measurement model for constructs for unidimensionality, validity, and reliability through the confirmatory factor analysis (CFA) (Afthanorhan et al., 2019; Awang, 2015; Awang et al., 2018; Mahfouz et al., 2019; Mohamad et al., 2019; Rahlin et al., 2019).

3. Results

3.1 Exploratory Factor Analysis

The objective of EFA was to explain and summarise the data by grouping together variables that correlate (Zikmund & Babin, 2010). EFA was conducted using the data obtained from the pilot study to obtain the underlying dimensions of behavioural belief, attitude, normative belief, subjective norm, control belief, perceived behavioural control, and intention to participate in critical reading. Several conditions were considered for EFA. First, the value of Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy (MSA) should be greater than 0.50. Secondly, Bartlett's test of sphericity results should be significant at $p < 0.001$, as recommended by Hair et al. (2014), Awang (2015), and Bahkia et al. (2019).

Table 1 outlines the results of the KMO and Bartlett's test of sphericity for behavioural belief, attitude, normative belief, subjective norms, control belief, perceived behavioural control, and

intention. The values of KMO for all constructs exceeded 0.5. The Bartlett's test of sphericity results for all constructs were significant ($p < 0.001$) as recommended by Hair et al. (2014), Bahkia et al. (2019), Rahlin et al. (2019), and Shkeer and Awang (2019).

Table 1. Results of KMO and Bartlett's Test of Sphericity

Construct	KMO (>0.50)	Bartlett's Test of Sphericity (p<0.001)
Behavioural Belief	0.799	0.00
Attitude	0.691	0.00
Normative Belief	0.728	0.00
Subjective Norms	0.699	0.00
Control Belief	0.846	0.00
Perceived Behavioural Control	0.758	0.00
Intention	0.741	0.00

In EFA, the principal component analysis was employed to examine the extraction of factors to determine the number of factors to be retained and eliminated. Varimax rotation was applied as it is the most widely used orthogonal factor rotation method and for its ability to clarify the analysis of factors (Hair et al., 2014; Shkeer & Awang, 2019). Factor loadings with an absolute value of below ±0.5 were discarded while those with more than ±0.55 were retained and measured (Hair et al., 2014). Table 2 shows the EFA results and the number of items for each construct before and after the analysis. Table 1 indicates that only subjective norm (SNM) experienced item reduction after the extraction process as four items were reduced to three items. The item "*I feel socially pressured to participate in critical reading*" was deleted as it did not achieve the recommended minimum factor loading of 0.6. Thus, the initial 31 items in the CRIS were revised to 30 items. The EFA results have also reported that the attitude (ATT) construct has to be divided into two components which are subsequently named Attitude Component 1 (AC1) and Attitude Component 2 (AC2) as depicted in Figure 2.

Table 2. Item Retention Result after EFA

No.	Construct	Items before EFA	Number of Items Dropped	Number of Items Retained after EFA
1.	Behavioural Belief	4	-	4
2.	Attitude	6	-	6
3.	Normative Belief	4	-	5
4.	Subjective Norms	4	1	3
5.	Control Belief	5	-	5
6.	Perceived Behavioural Control	4	-	4
7.	Intention	3	-	3

3.2 Confirmatory Factor Analysis (Pooled-CFA)

The study needed to validate all the measurement models of latent constructs for (1) unidimensionality, (2) validity, and (3) reliability (Afthanorhan et al., 2017; Aimran et al., 2017; Awang, 2015; Hair et al., 2014; Kashif et al., 2016; Mohamad et al., 2018). This procedure is called "confirmatory factor analysis" (CFA). The measurement model of the latent constructs had to pass three types of validity: convergent validity, construct validity, and discriminant validity (Awang, 2015; Hair et al., 2014; and Yusof et al., 2017). Convergent validity is evaluated by computing the average variance extracted (AVE). Construct validity is assessed by determining the fitness indices of the measurement model. Discriminant validity was established by developing the Discriminant Validity Index Summary. Composite Reliability (CR) was assessed to determine the reliability of

CRIS since it was a better alternative than the traditional method of computing the Cronbach Alpha for analysis (Awang, 2015; Aziz et al., 2016; Hair et al., 2014; Noor et al., 2015; Yusof et al., 2017).

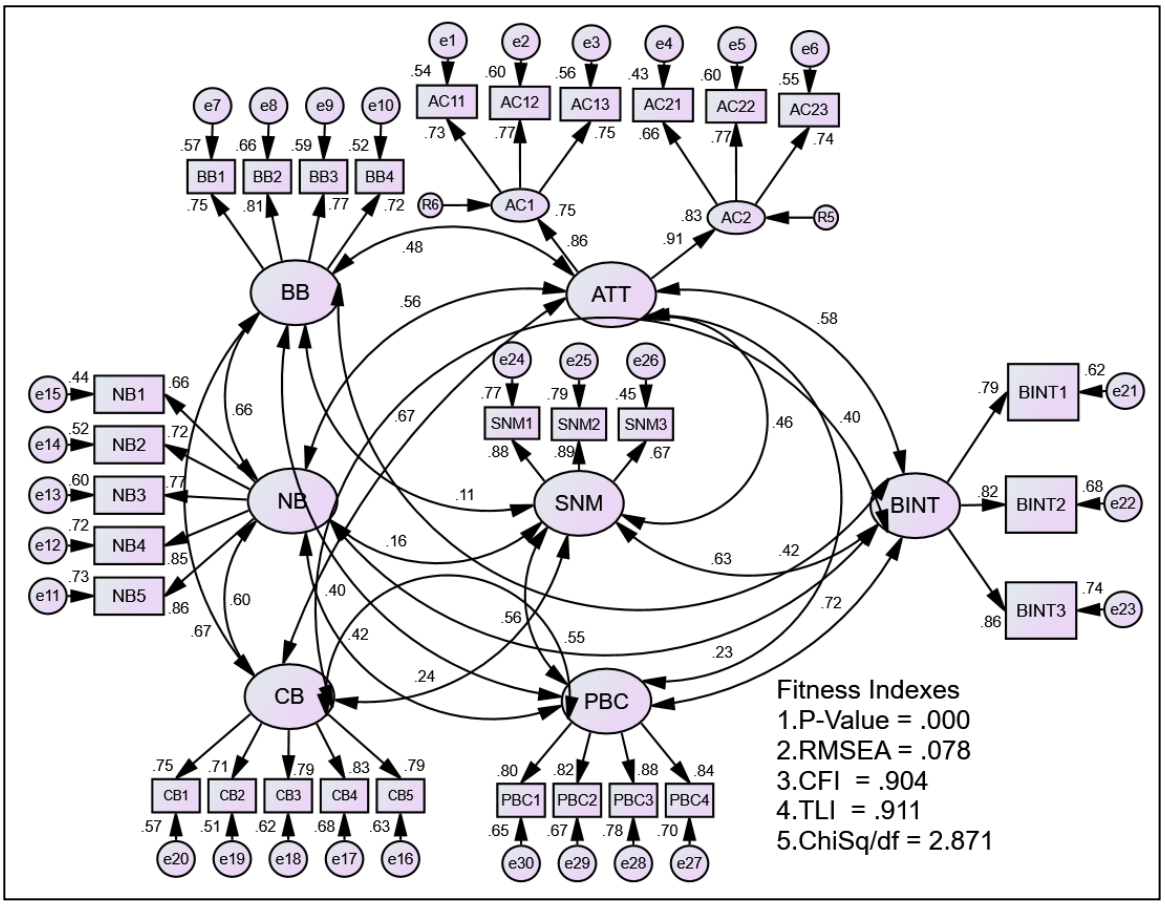

Fig. 2 Result from Pooled CFA Procedure

Figure 2 illustrates that all the constructs in this model were pooled for simultaneous validation using a pooled confirmatory factor analysis (Pooled-CFA). These constructs were pooled using double-headed arrows to execute the Pooled-CFA. According to Awang (2015) and Awang et al. (2018), model identification is not an issue when Pooled-CFA is used, despite certain constructs having less than four items since the combined constructs would increase the degree of freedom for the model. In the case of the current study, the Pooled-CFA was employed as it is more efficient than running CFA for every measurement model separately.

3.2.1 Unidimensionality

Unidimensionality refers to a set of variables that can be explained by one construct (Hair et al. 2014). According to Awang (2015), unidimensionality is achieved when all the measuring items for the respective constructs obtain acceptable factor loading. CFA items with low factor loadings should be deleted from the measurement model until the fit indices are achieved (Afthanorhan et al., 2017; Asnawi et al., 2019; Awang, 2015; Hair et al., 2014; Kashif et al., 2016).

Awang (2015) and Awang et al. (2018) listed two conditions that must be achieved before item deletion. The two conditions are:

1. The factor loading for newly developed items must be 0.5 or higher
2. The factor loading for established items must be above 0.6 or higher

Table 3. Factor Loading of All Items

	Construct/Item	Factor Loading
	Behavioural Belief	
BB1	My general knowledge increases when I participate in critical reading.	0.75
BB2	My level of English language improves when I participate in critical reading.	0.81
BB3	My creative thinking improves when I participate in critical reading.	0.77
BB4	My level of concentration improves when I participate in critical reading.	0.72
	Attitude	
AC11	Participating in critical reading is beneficial.	0.73
AC12	Participating in critical reading is useful.	0.77
AC13	Participating in critical reading is important.	0.75
AC21	Participating in critical reading is boring.	0.68
AC22	Participating in critical reading is difficult.	0.77
AC23	Participating in critical reading is a waste of time.	0.74
	Normative Belief	
NB1	My parents think I should participate in critical reading.	0.66
NB2	My friends think I should participate in critical reading.	0.72
NB3	My lecturers would approve of me participating in critical reading.	0.77
NB4	My future employers would approve of me participating in critical reading.	0.85
NB5	My friends participate in critical reading when they read academic texts.	0.66
	Subjective Norms	
SNM1	Most people who are important to me think I should participate in critical reading.	0.88
SNM2	It is expected of me to participate in critical reading.	0.89
SNM3	Most people who are important to me want me to participate in critical reading.	0.67
	Control Belief	
CB1	I expect that I will be highly motivated when I participate in critical reading.	0.75
CB2	I expect that my English will improve when I participate in critical reading.	0.71
CB3	I expect to be mentally tired when I participate in critical reading.	0.79
CB4	I expect my fear of negative feedback will prevent me from participating in critical reading.	0.83
CB5	I expect my fear of being wrong will prevent me from participating in critical reading.	0.79
	Perceived Behavioural Control	
PBC1	I am confident that I can participate in critical reading.	0.80
PBC2	I find it easy to participate in critical reading.	0.82
PBC3	Participating in critical reading is within my control.	0.88
PBC4	Participating in critical reading is entirely up to me.	0.84
	Intention	
BINT1	I will make an effort to participate in critical reading when I read academic texts.	0.79
BINT2	I intend to participate in critical reading when I read academic texts.	0.82
BINT3	I plan to participate in critical reading when I read academic texts.	0.86

Table 3 depicts that all items from every construct have surpassed the required factor loading values recommended by Awang (2015) and Awang et al. (2018). Thus, no item was deleted from this survey.

3.2.2 Convergent Validity

Convergent validity refers to a set of indicators that is presumed to measure a construct (Hair et al., 2014; Kline, 2011; Awang, 2015; Awang et al., 2018). As noted by Brown (2006), convergent validity represents the strength of relationships among items that are predicted to represent a single latent construct. The convergent validity of a construct can be verified by computing the average variance extracted (AVE). The construct achieved convergent validity if its AVE exceeds the threshold value of 0.5 (Awang et al., 2018; Awang, 2015; Fornell & Larcker, 1981; Hair et al., 2014). As shown in Table 4.12, the AVE for all the constructs surpassed the minimum value of 0.5. Attitude received the highest AVE (0.784) while Attitude Component 2 received the lowest factor loading (0.534). Thus, it can be concluded that the model has achieved convergent validity.

Table 4. Average Variance Extracted for All Constructs

Codes	Construct	AVE (above 0.5)
BB	Behavioural Belief	0.582
ATT	Attitude	0.784
	Attitude Component 1: POSITIVE	0.563
	Attitude Component 2: NEGATIVE	0.534
NB	Normative Belief	0.609
SNM	Subjective Norms	0.672
CB	Control Belief	0.601
PBC	Perceived Behavioural Control	0.698
BINT	Intention	0.672

3.2.3 Construct Validity

Construct validity is achieved when all the fitness indices for a model fulfil the required level (Awang, 2015; Awang et al., 2018). The three model fit categories—absolute fit indices, incremental fit indices, and parsimonious fit indices—are sufficient to establish construct validity (Awang et al., 2015, 2018; Kashif et al., 2015, 2016; Yusof et al., 2018; Asnawi et al., 2019). The most widely used indicators are root mean square of approximation (RMSEA), comparative fit index (CFI), and normed Chi-Square (x^2)/df (Awang, 2015; Awang et al., 2018). Table 5 summarises the fitness indices categories and the level of acceptance according to the literature.

As shown in Table 5, CRIS fulfilled all the three categories of fitness indices: (1) the RMSEA value was lower than 0.08 (0.078) hence establishing the absolute fit index; (2) the CRIS fulfilled the incremental fit index category by obtaining a CFI value (0.911) that surpassed the recommended value (0.90); (3) the parsimonious fitness index, which was measured using Chisq/df, received a value of 2.871, a value lower than 3.0 as recommended by Bentler (1990). Hence, this study has addressed the construct validity of the CRIS.

Table 5. Fitness Indices

Name of category	Name of index	Level of acceptance	Result	Status
Absolute Fit Index	RMSEA	RMSEA < 0.08 (Browne and Cudeck, 1992 Hu & Bentler, 1999)	0.078	Fulfilled
Incremental Fit Index	CFI	CFI > 0.90 (Bentler, 1990)	0.911	Fulfilled
Parsimonious Fit Index	Chisq/df	Chi-Square/df < 3.0 (Bentler, 1990)	2.871	Fulfilled

3.2.4 Discriminant Validity

Discriminant validity of the survey was also established to ensure that no redundant constructs occur in the model. Redundant construct occurs when any pair of constructs in the model are highly correlated. In assessing the discriminant validity, the discriminant validity index summary was developed (Table 4). The diagonal values (in bold) are the square root of the AVE of the respective constructs while other values are the correlation coefficient between the pair of the respective constructs.

Table 6. Discriminant Validity Index Summary

Construct	ATT	BB	NB	CB	PBC	BINT	SNM
ATT	**0.89**						
BB	0.48	**0.76**					
NB	0.56	0.66	**0.79**				
CB	0.67	0.67	0.60	**0.77**			
PBC	0.23	0.40	0.24	0.56	**0.84**		
BINT	0.58	0.42	0.55	0.40	0.72	**0.82**	
SNM	0.48	0.11	0.16	0.24	0.56	0.63	**0.82**

The discriminant validity of the respective construct was achieved since the square root of its AVE exceeds its correlation value with other constructs in the model (Table 6) (Awang et al., 2018; Awang, 2015; Hair et al., 2014). Discriminant validity was achieved as the diagonal values (in bold) were higher than any other value in its row and its column. Hence, the discriminant validity for all the constructs in the CRIS was achieved as the tabulated values in Table 4.14 meet the threshold of discriminant validity.

3.2.5 Composite Reliability

Composite reliability is used to estimate the reliability in the structural equation model (Awang et al., 2018; Awang, 2015; Hair et al., 2014). Composite reliability estimates of 0.7 or higher suggest good reliability while a score between 0.6 and 0.7 is considered acceptable (Awang, 2015; Hair et al., 2014). The analysis indicates that the composite reliability for all the constructs in the CRIS exceeded the minimum score of 0.6 (Table 4.15). The construct that obtained the highest composite reliability was perceived behavioural control, and the negative component of attitude obtained the lowest composite reliability. Hence, the composite reliability of CRIS was achieved.

Table 7. Composite Reliability

Codes	Construct	CR (above 0.6)
BB	Behavioural Belief	0.848
ATT	Attitude	0.879
	AC1: Positive	0.794
	AC2: Negative	0.774
NB	Normative Belief	0.885
SNM	Subjective Norms	0.858
CB	Control Belief	0.882
PBC	Perceived Behavioural Control	0.902
BINT	Intention	0.864

3.2.6 Normality Assessment

Finally, the normality distribution of all the items measuring the construct in CRIS was assessed. The values of skewness for all the items must not depart from normality (Asnawi et al., 2019; Awang, 2015; Hair et al., 2014; Kashif et al., 2015, 2016; and Mohamad et al., 2016, 2018). Skewness values that fall within the range of -1.5 to 1.5 are acceptable.

Table 8. Normality Assessment Results

Codes	**Item**	**Skewness**
BB1	My general knowledge increases when I participate in critical reading	-0.442
BB2	My level of English language improves when I participate in critical reading	-0.362
BB3	My creative thinking improves when I participate in critical reading	-0.169
BB4	My level of concentration improves when I participate in critical reading	0.400
AC11	Participating in critical reading is beneficial	-0.707
AC12	Participating in critical reading is useful	-0.365
AC13	Participating in critical reading is important	-0.720
AC21	Participating in critical reading is boring	-0.914
AC22	Participating in critical reading is difficult	-0.851
AC23	Participating in critical reading is a waste of time	-0.622
NB1	My parents think I should participate in critical reading	-0.543
NB2	My friends think I should participate in critical reading	-0.671
NB3	My lecturer would approve of me participating in critical reading	-0.827
NB4	My future employers would approve of me participating in critical reading	-0.862
NB5	My friends participate in critical reading when they read academic texts	-0.907
SNM1	Most people who are important to me think that I should participate in critical reading	-0.755
SNM2	It is expected of me to participate in critical reading	-0.732
SNM3	People who are important to me want me to participate in critical reading	-0.780
CB1	I become unmotivated when I participate in critical reading	-0.853
CB2	Low English proficiency makes it difficult for me to participate in critical reading	-0.935
CB3	I experience mental fatigue when I participate in critical reading	-0.859
CB4	My fear of negative feedback stops me from participating in critical reading	-0.509

Codes	Item	Skewness
CB5	My fear of being wrong stops me from participating in critical reading	-0.703
PBC1	I am confident I can participate in critical reading if I want to	-1.345
PBC2	I find it easy to participate in critical reading	-0.992
PBC3	The decision to participate in critical reading is beyond my control	-1.131
PBC4	Whether I use critical reading skill is entirely up to me	-1.368
BINT1	I will make an effort to participate in critical reading when reading academic texts	-1.127
BINT2	I intend to participate in critical reading when I read academic texts	-1.056
BINT3	I aim to participate in critical reading when I read academic texts	-1.191

The values of skewness for all the components in the model fall within the range of -1.5 to 1.5, which infers that their distribution does not depart from normality (Table 8) (Awang, 2015; Kashif et al., 2016; Mohamad et al., 2019; Asnawi et al., 2019). Thus, the data distribution in the CRIS met the requirement of normality distribution.

4. Conclusion

This study was undertaken to develop and validate a survey instrument for measuring students' intention to participate in critical reading. Findings from the EFA and CFA conducted suggest that the instrument was successfully developed to investigate the factors that influence students' intention in critical reading, referred to as the Critical Reading Intention Survey (CRIS). Findings from the EFA suggested the removal of one item from the subjective norms construct, i.e. *I feel socially pressured to participate in critical reading*. This item was eliminated for not achieving the minimum factor loading of 0.50 based on the data obtained from the pilot study. The CFA then confirmed that the CRIS fulfils the requirements for convergent validity, construct validity, and discriminant validity. Findings of the unidimensionality and normality assessments also indicate that the items in the CRIS instrument are valid. Therefore, the results from the EFA and CFA have proven that the CRIS instrument is reliable for measuring students' intention to participate in critical reading.

This study recommends applying CRIS in various research settings, including in Western countries. This instrument was developed in Malaysia, whose collectivist culture is characterised by students engaging in a behaviour if their intention is encouraged by an authoritative figure, such as a parent or a teacher (Hung & Jeng, 2012; Pi-Yueh et al., 2012). Future research may explore other factors that may influence students' intention to participate in critical reading, such as self-efficacy, learning environment, and teachers' quality of feedback. Also, more information on the influence of moderating variables including material format (online or offline), gender, and ethnicity could be incorporated by scholars to enhance the strength of the CRIS instrument. Students' critical reading behaviour assessment could also be added to the instrument to develop a more comprehensive understanding of the factors that influence students' intention to participate in critical reading and students' critical reading performance.

5. Co-Author Contribution

The authors declared that there is no conflict of interest in this article. Author1 carried out the fieldwork, prepared the literature review, and reported the results. Author2 advised and managed the overall write-up and conducted the final revisions of the article. Author3 checked and validated the statistical analysis and interpretation of the results.

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7. References

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