

DEVELOPING A QUESTIONNAIRE TO MEASURE STUDENTS' ATTITUDES TOWARD THE COURSE BLOG?

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ABSTRACT

The rapid growth of using Web 2.0 tools such as blogs has increased online courses in education. Questioners are the most commonly used instruments to assess students' attitudes toward the online courses. This study provides a set of specific guidelines that the researchers used to develop a questionnaire to measure students' attitudes toward the course blog. It focuses on test construction and instrument validation as two primary stages in developing the questionnaire and details a series of steps nested within two stages. Participants were 30 undergraduate students enrolled in a course blog. To analyze the data, qualitative findings of interview were complemented by statistical results from quantitative data. To improve content adequacy and internal validity of the instrument items, 25 students who took part in piloting the instrument were interviewed. We carried out Statistical analysis to evaluate inter-item correlations, and reliability alpha coefficient of the instrument items. The guidelines applied in this study can be used in other studies to develop a valid instrument to measure other constructs, particularly when a researcher does not have access to a large sample.

Keywords: Questionnaire; course blog; attitude

INTRODUCTION

The rapid growth of using Web 2.0 tools such as blogs has increased online courses in education. Research shows that students' attitude toward online courses is a significant factor which may affect their learning ([Simsek, 2008](#)). Positive attitudes enhance learners' motivation to learn and retain information in particular circumstances, while negative attitudes may result in resisting learning (Duda & Garrett, 2008).

Giving a definition to attitude has always been a perennial problem because of its construct which implies a learner's way of thinking positively or negatively (Lopper, 2006). To assess students' attitudes in a learning environment, questionnaires are considered as a reliable instrument (DeVellis 2003; Colosi, 2006; Radhakrishna, 2007). There are three common approaches in applying questionnaires. The first is to select and apply a questionnaire that has been previously developed and used by other researchers. The second approach is to develop a questionnaire through the modification of an existing questionnaire.

The third is to develop a new questionnaire due to a lack of suitable questionnaire to explore the constructs that have not been investigated in previous research (Estabrooks & Wallin, 2004).

The third approach deems more reliable than others because developing questionnaire reduces measurement error; however, inadequate attention to psychometric assessment and reliability evaluation is considered major obstacles for instrument developers in this approach (Estabrooks & Wallin, 2004). For example, to assess students' attitudes toward blogs, researchers used a self developed instrument without reporting anything on reliability and validity as vital entities to develop a reliable and valid instrument (Pinkman, 2005). This study attempts to provide a set of particular guidelines to develop a questionnaire. It also exemplifies the application of these guidelines in assessing students' attitudes toward the course blog. The main reason for conducting the course blog was the frequent use of blogs as a social essence of Web 2.0 tools in education (Kurt, Izmirli, & Sahin-Izmirli, 2011). Blogs allow students to act autonomously, to improve their motivation, productivity, cultural knowledge, language, and communication (Rezaee & Oladi, 2008). Students can interact with other students and their teacher anywhere and anytime (Tu, Chen, & Lee, 2007). They can also edit or omit whatever they have posted on blogs (Johnson, 2004). However, understanding blog facilities alone cannot fully explain students' effective application of the course blog, unless we consider students' attitudes in a learning environment (Shahsavari & Tan, 2011).

Guidelines in instrument development

Particular guidelines are required to develop a valid instrument (Burton & Mazerolle, 2011). This study provides a set of specific guidelines focused on two stages and a series of steps nested within them to develop an instrument (see Figure:1).

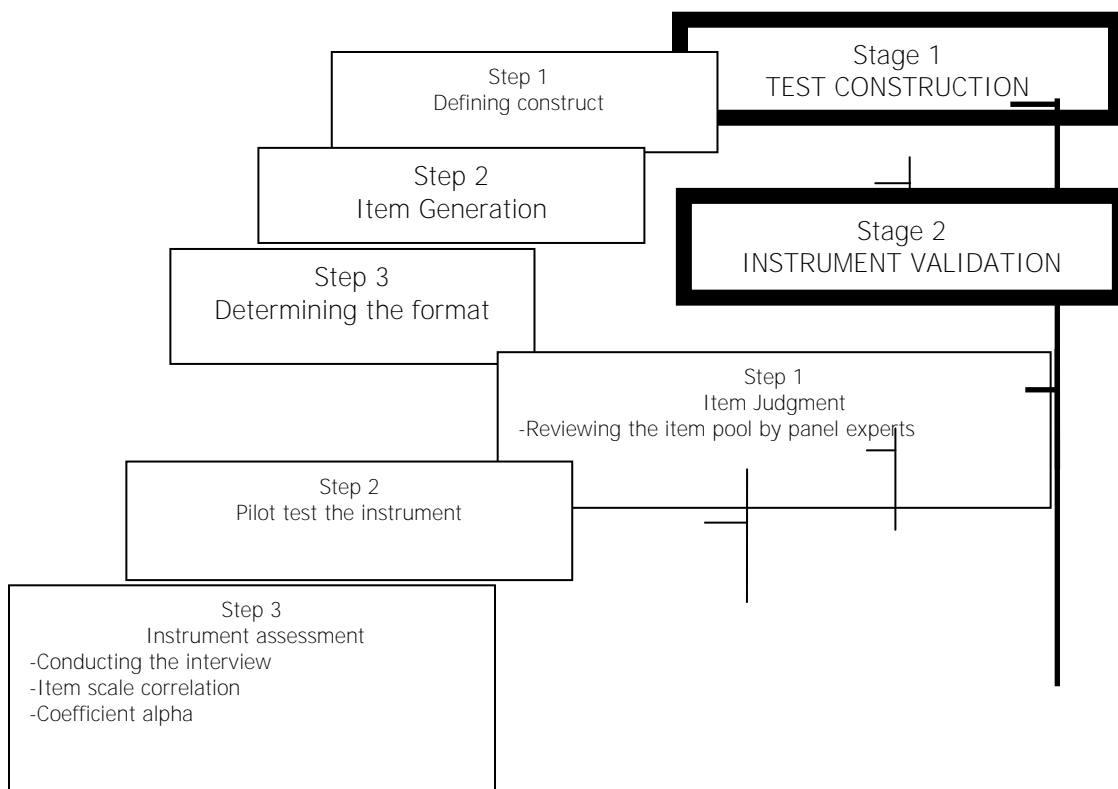


Figure 1:
A flow diagram on an instrument development

These guidelines are set out by the researchers after a comprehensive review of available guidelines in scale development (e.g., Delamere, Wankel, & Hinch, 2001; DeVellis, 2003; Ping, 2005; Burton & Mazerolle, 2011; name as a few).

Stage One: Test Construction

As Figure 1 shows, stage 1 describes the process of moving from conceptualization levels to item constructions in developing the instrument. This stage seeks to gather input on test construction in three steps: defining construct, item generation, determining the format (see Figure 1).

Defining the construct is the most significant step for developing items. Instrument developers require deep thinking about the construct. To this end, they have to explore the relevant literature and also focus on the research domain. In some cases, an instrument may exist from a particular domain which may not be applicable to other domains (Burton & Mazerolle, 2011). For example, an instrument may exist to measure students' attitudes toward a blog as a learning tool which may not be applicable to assess students' attitudes toward the course blog.

Generating an item pool represents the instrument concept and captures its construct essence (Delamere, 1997; DeVellis, 2003; Ping, 2005). In this step, instrument developers should generate items and examine them for different item characteristics such as, ambiguous pronouns, misplaced modifiers (DeVellis, 2003), avoidance of leading items, abstract terms and jargon, vague statement, multiple negative, and double barreled (Office of Educational Assessment, 2006).

Determining the format of the instrument is the last step that occurs with item generation simultaneously because the two are compatible (DeVellis, 2003). Various formats exist to present items in the instrument: Thunderstone scaling, Guttman scaling, Likert scale, semantic differential, visual analog scale, binary options, time frames, and unipolar versus bipolar scale (see DeVellis, 2003; Office of Educational Assessment, 2006, for more information on each format). Instrument developers should select the format with respect to the instrument construct. For example, since a Likert scale specifies the level of agreement or disagreement of respondents, it is regarded as the most reliable format extensively applied to measure attitude (Zan & Martino, 2007).

Stage Two: Instrument Validation

Stage 2 presents the instrument validation in three steps: item judgment, pilot test the instrument, and instrument assessment (see Figure: 1).

Item judgment serves different purposes to maximize the instrument face validity and content-related validity as the primary steps in establishing construct validity (Burton & Mazerolle, 2011).

In this step, to ensure instrument developers that items are clearly worded, a panel of experts reviews an item pool to evaluate the clarity, readability and content validity of items (Delamere, et al., 2001; Mayfield & Crompton, 1995).

The "Delphi Technique" is one of the most common methods to gain experts' knowledge, ideas, and agreement about the item pool (Delamere et al., 2001, p. 13). In this method, each panel expert reviews item pool independently in two or more rounds to evaluate and give comments on clarity, readability and content validity of items. After each round, the instrument developer provides an anonymous summary of experts' feedback and reasons they provided for their judgments to develop revised item pool. However, the instrument developer is responsible to accept or reject experts' advice to retain, remove, synthesize or change items in each round. The summary and revised items will be returned to experts for another round.

The panel applies the same procedure on item pool and the instrument developer makes amendments accordingly. The process will be stopped after receiving a panel confirmation on a final feedback report and items (Delamere et al., 2001).

The second step of instrument validation is to pilot test an instrument. An appropriate sample size and subjects should be used for pilot testing an instrument. In addition, instrument developers should select the sample from the population of interest for the study. Participants' [demographic profile](#) such as their level of experience or education should well match the subjects' profile of the main study (Burton & Mazerolle, 2011).

The last and most fundamental step of instrument validation is instrument assessment. Instrument developers can evaluate and analyze the performance of individuals on each item by conducting the interview, using item scale correlation to assess correlation among items (Field, 2000), coefficient alpha to measure the internal consistency or reliability for scale items (Oppenheim; 1992). However, factor analysis has also been used in many studies in order to purify the scale items and reduce the number of items without scarifying instrument reliability (Burton & Mazerolle, 2011).

This study attempts to exemplify how the aforementioned guidelines are used to develop a questionnaire to measure students' attitudes toward the course blog.

METHOD

Participants

In this study, 30 undergraduate students took part in the course blog to pilot test a questionnaire. Students aged between 20 and 25 enrolled in an obligatory course in the first semester of 2010. All spoke English as a second language. Most students had personal computers and home or dormitory Internet access.

Procedure

In this study, to develop the questionnaire measuring students' attitudes toward the course blog, the researchers applied a set of particular guidelines presented in Figure 1. The finalized course blog attitude questionnaire (CBAQ) is presented in Appendix.

First, we constructed the test by describing lines of thought addressed us to define attitude such as: What is attitude? What does students' attitude to the course blog mean? To arrive at precise answers for these questionings, we carried out a comprehensive review of Web 2.0 tool attitude instruments: Loyd and Gressard (1984), Shih and Gamon (2001), Cheong and Cheung (2008), Duda and Garrett (2008), Shahsavar, Tan, and Aryadoust (2010), and 31 computer attitude instruments presented by Shaft, Sharfman, and Wu (2004).

After articulating the purpose of the instrument, we generated a pool of 30 items. We examined items based on item characteristics as pointed out earlier in item generation. Moreover, to boost the internal consistency, we used some redundant items (see item 5 & item 19 in Appendix). We also advocated using four-point Likert-type scale ranging between 1 (e.g., strongly disagrees) and 4 (e.g., strongly agree).

After generating a pool of appropriate items and selecting a format for instrument, we applied item judgment to maximize the instrument validation. Delphi Technique was applied to analyze items critically by a panel of experts. The panel was composed of six individuals who had worked with developing the questionnaire in an online learning environment and also been familiar with blogs.

Each panel expert reviewed the item pool independently in two rounds to evaluate and give comments on clarity, readability and content validity of items. At the end of the first round, we provided an anonymous summary of experts' feedback and reasons they provided for their judgments (see Table: 1).

Table: 1
Examples of item judgment by expert panels in two rounds

#	Item pool	Experts' comment
1	Blogs make the class more interesting to me.	-This item seems to evaluate interest. (R1) -Use "a course blog" instead of "blogs" (R1) -Rephrasing the item. (R2) -Define the course blog? (R1) -Clarify training course on blogs. (R2)
2	I have to do a difficult training course blog to understand how to use blogs.	
3	Blogs help me to learn new terms and new ideas from my classmates.	-Use a simpler word like "word" instead of "term". (R2)
5	I enjoy sharing my knowledge with my classmates on blogs.	-Omit item 5 or item19 as they are redundant.
6	I am not familiar with blogging*; therefore I did not find it interesting. (*blogging means writing on a blog)	-The item is double-barreled. (R1)
7	Using blogs is a waste of time for learning.	-Reword the item. (R1)
8	A course blog provides me with learning opportunities that I have never tried before in traditional classrooms.	-What does traditional classroom mean? (R1)
9	I feel isolated as a student when I take a course blog.	-Rephrase the item. (R2)
14	Blogs help us to communicate and discuss more with other students.	-The item is double-barreled. (R1)
15	I feel aggressive and hostile toward using blogs in class.	-The item is double-barreled. (R1) -Hostile seems inappropriate in this context. (R2)
16	Blogs are good as a learning tool for thinking, arguing and discussing with others.	-The item is three-barreled item. (R1)
19	It is interesting to share our personal idea with others on blogs.	- This item and item 5 are redundant, omit one. -"Our" is an ambiguous pronoun. (R2)

Note. # = item numbers in the CBAQ presented in Appendix. R1= experts' comment to item pool in the first round. R2 = experts' comment on item pool in the second round.

The summary and revised items were returned to the experts for the second round. However, in both rounds, the researchers made a final decision on retaining, removing, or modifying items (DeVellis, 2003). For example, three experts referred to item redundancy between item 5 and 19 (see Table 1) and commented on omitting one of them but the researchers decided to keep them to increase the internal consistency. The process completed after receiving a panel confirmation on the second feedback report. At this stage, we kept 22 items that had been reviewed by experts and modified by the researchers accordingly.

This process allowed us to advance to instrument validation. To pilot the questionnaire, three face-to-face training sessions were conducted in a computer lab before students started practicing through a blog independently. During the first training session, students were briefed on the purpose of the study and they were told that their participation on blog was compulsory. After that they registered on the blog created by one of the researchers at <http://www.blogger.com>. While their blog display names were changed to protect their identity. Since few students did not have any experience in blogging, first they had some hands-on practice on basic blogging skills such as posting, and leaving comments on blog. This pilot study assisted the teacher in piloting the questionnaire to measure students' attitude in the main study. Twenty two items that had been reviewed by experts and modified were administered to students to precede the instrument validation.

Data analysis and results

To assess students' performance on items, qualitative findings of interview were complemented by statistical results from quantitative data. To improve content adequacy and internal validity of the instrument items, 25 students who took part in piloting the instrument were interviewed. Two kinds of interviews were conducted: a focus group interview and individual interview which took 20 and 10 minutes respectively. The interview questions were fixed and open-ended such as: How did you find the instrument items? Did you get the meaning of all items? Do you have any comments to improve the instrument?—Students' responses to interview questions were audio taped and then analyzed along with the researchers. Some students identified ambiguous and difficult items and expected for rewording, rephrasing, or removing them (see Table: 2).

Table 2:
Examples of Students' Reasons Comments on the Items

#	Item	Students' comment
1	Blogs make the course more interesting to me.	Rephrase the item.
2	I need to do a lot of training on blogs to understand how to use them.	Rephrase the item.
7	Using blogs for learning is a waste of time.	Reword the item.
8	A course blog provides me with learning opportunities that I have never tried before in traditional classrooms*. (*A traditional classroom refers to a teacher-fronted classroom that requires the physical presence of students in the same space and time.)	Remove "Traditional classrooms" definition.
1	I feel aggressive toward using blogs in class.	"Aggressive" is an ambiguous word.
5		
1	It is easier to voice out my opinions through blogs than speak it	The item looks ambiguous.
7	face to face with my instructor.	

Note. # = item numbers presented in the CBAQ in Appendix.

For example, most of them mentioned that they were familiar with traditional classroom definition and expected for omission the definition (see Table 2, item 8) or 20 interviewees had problems in the meaning of "aggressive" and expected for rewording it (see Table 2, item 15).

We carried out Statistical analysis to evaluate inter-item correlations, and reliability alpha coefficient of items by applying SPSS computer program, Version 16 (SPSS Inc., 2007). Firstly, reverse coding was run to consider those items of the instrument whose correlations with other items were negative. Likewise, since some negative correlation among items may not be applicable by reverse coding (DeVellis, 2003), item scale correlations and the internal consistency were commuted and examined for items.

The inter-item correlation coefficients of items fell between 0.30-0.60 which was accepted as the moderate inter-item correlation (Burton & Mazerolle, 2011) and the internal consistency of items was 0.88 which shows good level of consistency (Cronbach & Richard, 2004). Considering all these factors, the CBAQ was developed to assess students' attitude to the course blog (see Appendix).

CONCLUSION

The rapid development of Web 2.0 tools has changed education by facilitating students' learning. Understanding these facilities alone cannot fully explain users' effective application of online courses unless the instructors consider students' attitudes to online courses (Simsek, 2008). This paper provides a set of guidelines to develop the instrument to measure students' attitudes to the course blog. The guidelines may be applied in other studies to develop an instrument to measure other constructs particularly when a researcher does not have access to a large sample.

Limitations and further research

Research shows that using reliability alpha coefficient and factor analysis in tandem would improve an instrument psychometric features and validity (Burton & Mazerolle, 2011). Although factor analysis assists researchers in assessing the dimensionality of remaining items and purifying the instrument, it demands a large data set (Field, 2000). Some commentators refer to a ratio bigger than 5 respondents for each item as the minimum requirement of factor analysis (Hair, Black, Babin, & Anderson, 2010), while others recommended a minimum overall sample of 300 respondents, or a minimum of 10 respondents for any instrument item (Burton & Mazerolle, 2011).

In this study, even if the researchers had easy access to undergraduate students, some practical problems limited the desirability of a large subject:

- the computer lab had approximately 35-40 seats for students to participate in the course blog activities in face-to-face sessions;
- creating blog at www.blogger.com had maximum size limitations of 100 users. Future studies, which apply other Web 2.0 tools in online courses by overcoming these limitations, will need to be undertaken.

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APPENDIX
The Course Blog Attitude Questionnaire

#	Statement	S	D	A	S
		D			A
1	A course blog* is very interesting to me. <i>(*A course blog means a blog that has been set up by the teacher to facilitate students' online learning.)</i>				
2	I need do a lot of training in a course blog to understand how to use blogs.				
3	Blogs help me learn new words from my classmates' postings.				
4	Blogs help me get new ideas from my classmates' postings.				
5	I enjoy sharing my knowledge with my classmates on blogs.				
6	As a new way of writing, I think blogging* is interesting. <i>(*blogging means writing on a blog)</i>				
7	Using blogs in a learning process is a waste of time.				
8	A course blog provides me with learning opportunities that I have never tried before in traditional classrooms.				
9	I felt isolated when I participated in a course blog.				
10	It is easier for me to convey my thoughts through blogs than to converse face-to-face with my classmates.				
11	A course blog is quite boring.				
12	I'm not the type to do well with blogs.				
13	I prefer working alone to working with other students in a course blog.				
14	Blogs help me to communicate more with other students.				
15	I do not like to use blogs.				
16	Blogs are good as a tool for discussing with other students.				
17	It is easier to voice out my opinions through blogs than to convey it face- to-face to my instructor.				
18	I'm motivated to read others' postings before blogging.				
19	It is interesting to share my personal ideas with others on blogs.				