

Factor Analysis in the Development of Online Course Evaluation Instrument



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Abstract

Course evaluations designed for face-to-face classes often have limited applicability for evaluating online instruction. After a review of the research literature, the investigators designed and implemented an end-of-course evaluation instrument. This poster shows the refinement of a course evaluation used specifically for fully online courses using exploratory factor analysis. Thirty-three items comprised the original instrument. Twenty-eight items loaded into eight factors.

Purpose of Study

The purpose of this study was to identify the underlying latent constructs in a set of measured item of the instrument. Specifically, Exploratory Factor Analysis (EFA) was used to aid in the development and revision of the instrument.

Research Questions

- The following research questions guided the study:
1. How many latent dimensions can be identified in the online course evaluation instrument?
 2. Which, if any, items in the instrument are need to delete, and/or revise?

Method and Procedures

Exploratory Factor Analysis (EFA) was conducted to determine the factor structure of the instrument that allows researchers to make decisions about which items or measures to keep, delete, and/or revise.

1. An instrument was developed based on a panel of faculty and administrators from across the System involved with online education and from a comprehensive literature review.
2. Students were asked to complete the online evaluation instrument.
3. Exploratory Factor Analysis was used to analyze the data.
4. Extract some number of factors.
5. Rotate the factors.
6. Interpret the factors.
7. Conduct instrument / item revision.

Eight factors with principal-components factor analysis and varimax rotation were used in this study based on the following criteria.

1. The eigenvalues greater than 1.0 rule and Scree plots
2. Consider interpretable and theoretically plausible.
3. Obtain solutions with different (reasonable) numbers of factors and study them to see which factors keep "showing up".

Factors that appear consistently are most likely to be "real". Noted that the eigenvalues represent the variance accounted for by each factor. These eight factors account for almost 70 % of the total variance.

	F1	F2	F3	F4	F5	F6	F7	F8
Dates for exams/quizzes were clearly communicated.	0.76							
Standards for course participation were clear.	0.72							
The amount of time necessary to succeed in this course was clearly communicated.	0.72							
Expectations for course grades were clear.	0.72							
The instructor provided specific assignment deadlines.	0.63							
The course goals and objectives were clear.	0.62							
The instructor provided clear expectations for response time.	0.60							
The instructor encouraged students to express opinions and thoughts.		0.76						
The instructor encouraged students to respect the perspectives of others.		0.73						
The instructor encouraged students to pursue ideas of interest to them.		0.69						
The instructor's replies to my questions were adequate.			0.81					
I was able to contact and get a response from instructor during stated times he/she was available.			0.77					
The instructor acknowledged my e-mails/discussion posts in a timely manner.			0.74					
The instructor encouraged me to contact him/her.			0.64					
The Internet connection I used allowed me to participate adequately in the course.				0.90				
The computer I primarily used was adequate for my participation in the course.				0.86				
My technical abilities were adequate to participate in this course.				0.72				
The instructor provided examples of good work.					0.69			
Links to supplementary web sites were active generally.					0.65			
Additional software/plugin [Flash, MathML, Acrobat] was easy to install.					0.65			
I found the course layout easy to navigate.						0.73		
Course components [tools, lessons, quizzes] were easy to find.						0.65		
Learning to use e-mail and discussion tools was not difficult.						0.64		
Instructor feedback on discussions added to my understanding of course materials.							0.68	
The instructor provided feedback on graded assignments and quizzes in a timely manner.							0.63	
The instructor's feedback helped me better understand course material.							0.52	
Discussions with other students added to my understanding of course materials.								0.62
Participation in discussion with other students was expected.								0.53

Eight Factors

F1: Course Structure and Clarity of Expectations

F2: Respecting Diverse Talents

F3: Instructor Interaction With Students

F4: Technical Tools and Skills

F5: Technology Availability

F6: Course Navigation and Design

F7: Instructor Feedback

F8: Student to Student Contact

Findings

- Eight factors were identified.
- Three factors addressed faculty roles and responsibilities online (F2, F3, F7).
- Two factors addressed course design (F1, F6).
- Two factors addressed use of technology by students (F4, F5).
- One factor addressed student to student interaction (F8).
- Five items were shown to load on multiple factors and are not included in the revised instrument.

Future Research and Limitations

- Instrument needs to be evaluated for a second semester across multiple programs.
- Time on task and course activities were not sufficiently explored by the original instrument. Items need to be developed to tap this dimension of the student experience.
- Instrument needs to be explored for differences in response patterns by completers and non-completers.