

How to Determine Student Preferences for
Online LMS Versus Face-To-Face Learning Environments
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Abstract

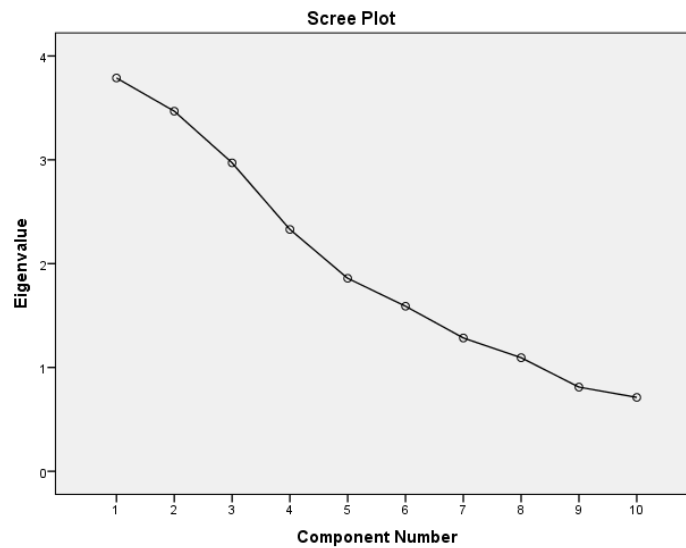
This paper discusses the factors in evaluating whether or not students prefer to take classes in person or online and how to create an instrument to help with such a determination. Factor analysis is used to help create an example instrument to use in the determination process. A design instrument was created to evaluate how teachers and students of both genders and different ages felt about using an online learning management system (LMS) versus a traditional face-to-face learning environment (LE). There should be a diversity of data solicited with the instrument to ensure that the instrument collects usable information, (Aeronautics and Space Administration, 2017). Factor analysis, multi-dimensional scaling, and a Hierarchical Cluster analysis were performed to try to get as much information as possible for which to review the data collected in the table.

Introduction

The instrument used in the study asked 10 questions of the students about the comfort level or lack thereof with participating in an online LMS versus that of participating in a traditional face-to-face LE. The gender, age, and student/instructor status of each participant was collected. There was some concern about the individual biases of the students as some may have already had a preference to use one LE technology over the other and this was accounted for in the instrument. This was done in an attempt to try to avoid inconsistent results on this study. Strengthening an instrument should be the goal of a good researcher in order for the instrument to provide more reliable information the study, (Pett, Lackey, & Sullivan, 2003). A Factor Analysis, Multidimensional Scaling, and a Hierarchical Cluster Analysis were used to determine the viability of the instrument in evaluating the feedback from the students.

Rotated Component Matrix^a

	Component			
	1	2	3	4
Q3	.744	.267	.152	.321
Q5	.725	-.140		-.275
Q8	.673	-.104	-.108	-.125
Q7		.860		.126
Q9	-.241	.795		-.189
Q4		.194	-.776	.108
Q6	.132		.631	.513
Q10	-.286	.112	.557	
Q1	.285	.331	.511	
Q2	-.204		-.121	.833



Discussion

The grouping of questions was reviewed and looked at to what similarities, if any, that were being picked up. Questions #05 and #08 were not very similar, from my estimation and so this looked to be a random occurrence.

Question #05: The Online LMS allows me start-to-finish interaction with students/instructors without the need for a live human interaction.

Question #08: The Online LMS allows me start-to-finish interaction with students/instructors without the need for a live human interaction.

When I did the mean (average) responses for Question #05 versus Question #08, it was 3.025 to 2.9, respectively, and wasn't out of line with the mean (average) responses from the other 10 questions.

Question #07: The Online LMS interface is user-friendly, easily allowing me to navigate it.

Question #09: The Online LMS is impersonal.

The correlation between Questions #07 and #09 is consistent with what was discovered in the analysis. These two questions were more similar and I could understand the correlation. However, it made me wonder if the questions were redundant and perhaps eliminating one might improve the instrument. Redundancy can be great if it is used to properly triangulate information, but if not enough pertinent information is collected it is less likely to benefit the study, (Asmar, Renzetti, & Jet Propulsion Laboratory, 199

Rotated Component Matrix^a

	Raw Component				Rescaled Component			
	1	2	3	4	1	2	3	4
Q1	.374	.798	.514	-.091	.258	.551	.355	-.063
Q2	-.244	-.150	-.051	1.263	-.167	-.103	-.035	.866
Q3	1.030	.248	.375	.391	.740	.178	.269	.281
Q4	.058	-1.065	.279	.194	.042	-.767	.201	.140
Q5	1.051	-.037	-.209	-.403	.729	-.026	-.145	-.280
Q6	.199	.962	-.087	.693	.138	.664	-.060	.478
Q7	.122	-.013	1.218	.158	.087	-.009	.868	.113
Q8	.989	-.179	-.160	-.140	.692	-.125	-.112	-.098
Q9	-.323	-.015	1.036	-.212	-.241	-.011	.771	-.158
Q10	-.359	.669	.121	-.036	-.266	.496	.090	-.026

Extraction Method: Principal Component Analysis.

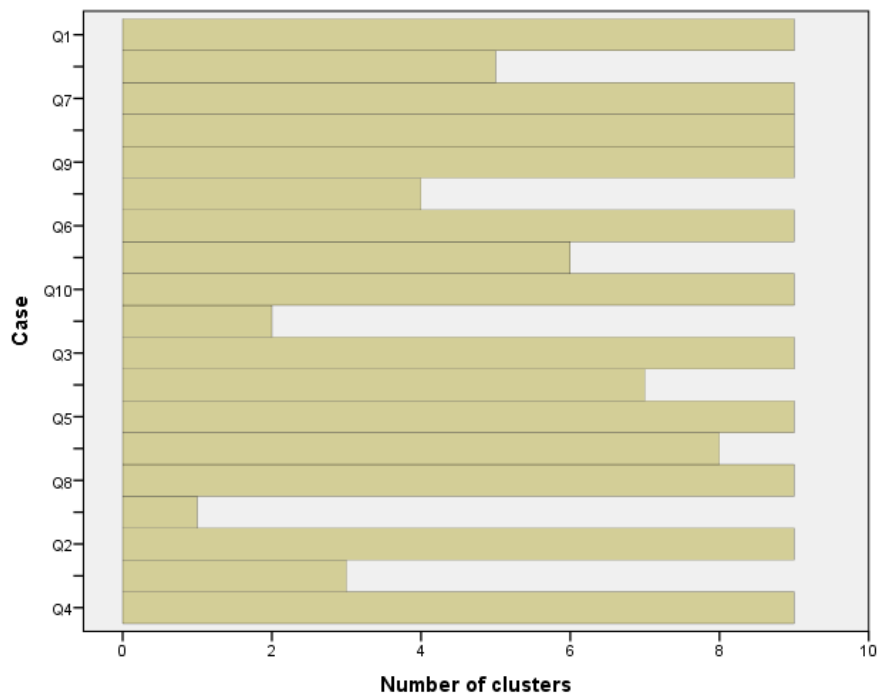
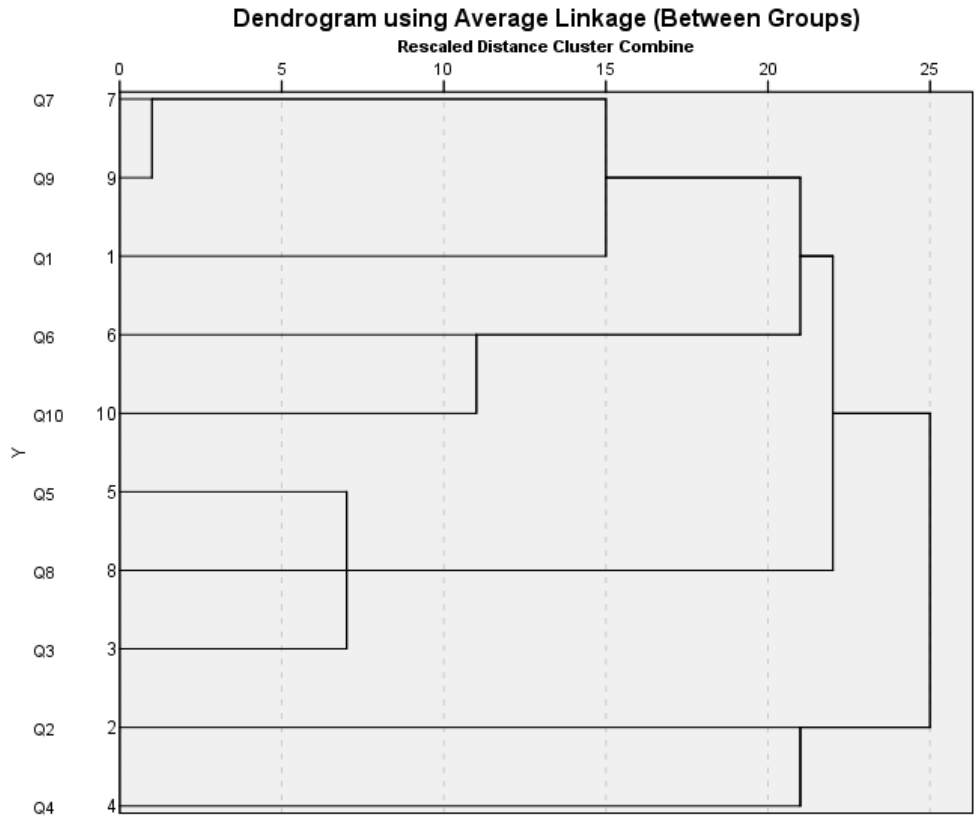
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 6 iterations.

Results

In moving on to the second part of the learning objectives, there was Hierarchical Cluster analysis conducted. There did seem to be some reinforcement of the information evaluated through the Multidimensional Scaling. For instance, viewing the Dendrogram, it shows a close relationship between Question #07 and Question #09.

Questions #01, #05, and #07 showed similar clustering, which made logical sense because the questions were similar in nature as they each related to the ease of use of the LMS. The clustering was further evidence triangulation with data. Question #08 was had very dissimilar responses than Question #05, also evidenced with Multidimensional Scaling.



Conclusion

With the Factor Analysis, the data results didn't seem to be as consistent with the, additional sections, the Multidimensional Scaling and the Hierarchical Cluster Analysis. In the Rotated Component Matrix, there were given four factors. Questions #03, #05, and #08 were all in factor one. Information obtained in the Multidimensional Scaling and Hierarchical Cluster Analysis were a bit confusing as Question #05 and Question #08 to be dissimilar and contradictory. However, in factor two, Questions #07 and Question #09 were grouped together, consistent with the results of the latter analyses. My Skree Plot, however, was very ambiguous and reinforces my belief that I should work to strengthen my instrument. Ultimately, it seemed clear from the data that older students and instructors seemed to prefer the face-to-face LE over the online LMS. Most of the data collected by the participants didn't seem to show a great deal of consistency for this first assignment and the instrument will need to be revised going forward. Additionally, there is the importance of refining the scaling instrument used in the research. Due diligence should be done to ensure that the questions are relevant to the study for the basis of efficiency and clarity, (King & NASA Glenn Research Center, 2016). The metrics of the analysis were compiled just fine. However, perhaps there should have been more research put into developing the research instrument itself.

References

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Jaime Reborn's

Online LMS Interview Questions

Please complete this interview about the Artificially Intelligent Customer Service Technology (Online LMS), pronounced "assist", at your university or place of work to indicate the extent to which you agree or disagree with the following statements:

SD = Strongly Disagree
 D = Disagree
 N = Neutral
 A = Agree
 SA = Strongly Agree

Status (Circle One)	Instructor/Student
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Gender: (Circle One)	Male/Female
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Age Group: (Chose One)					
20-29	30-39	40-49	50-59	60-69	70+

1	The Online LMS is easy for me to operate and retrieve necessary information.	<input type="radio"/> SD	<input type="radio"/> D	<input type="radio"/> N	<input type="radio"/> A	<input type="radio"/> SA
2	The Online LMS allows me to reach the necessary instructors/students.	<input type="radio"/> SD	<input type="radio"/> D	<input type="radio"/> N	<input type="radio"/> A	<input type="radio"/> SA
3	The Online LMS gives me the option of having live/synchronous, two-way communication with my instructors/students.	<input type="radio"/> SD	<input type="radio"/> D	<input type="radio"/> N	<input type="radio"/> A	<input type="radio"/> SA
4	The Online LMS provides me with sufficient services and contact information for afterhours support from the college/university.	<input type="radio"/> SD	<input type="radio"/> D	<input type="radio"/> N	<input type="radio"/> A	<input type="radio"/> SA

Running Head: Online LMS Versus Face-To-Face LE

5	The Online LMS allows me start-to-finish interaction with students/instructors without the need for a live human interaction.	<input type="radio"/> SD	<input type="radio"/> D	<input type="radio"/> N	<input type="radio"/> A	<input type="radio"/> SA
6	The Online LMS allows me to leave messages with a student/instructor/administrator of my choice if they are not available at the time that I attempt to reach them live via Online LMS.	<input type="radio"/> SD	<input type="radio"/> D	<input type="radio"/> N	<input type="radio"/> A	<input type="radio"/> SA
7	The Online LMS interface is user-friendly, easily allowing me to navigate it.	<input type="radio"/> SD	<input type="radio"/> D	<input type="radio"/> N	<input type="radio"/> A	<input type="radio"/> SA
8	The Online LMS makes me feel as if the administrators of the college/university are proactively attempt to assist me in the learning process.	<input type="radio"/> SD	<input type="radio"/> D	<input type="radio"/> N	<input type="radio"/> A	<input type="radio"/> SA
9	The Online LMS is impersonal.	<input type="radio"/> SD	<input type="radio"/> D	<input type="radio"/> N	<input type="radio"/> A	<input type="radio"/> SA
10	The Online LMS is preferred to a traditional face-to-face LE.	<input type="radio"/> SD	<input type="radio"/> D	<input type="radio"/> N	<input type="radio"/> A	<input type="radio"/> SA

LMS – Learning Management System

LE – Learning Environment