

DEVELOPMENT AND STANDARDIZATION OF ONLINE CLASS ENVIRONMENT SCALE (OCES)

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ABSTRACT

This article explores the development and standardization process of the Online Class Environment Scale. The Online Class Environment scale is developed with six dimensions such as Interest, Family Environment, Technology in Teaching-Learning, Evaluation, Psychological Aspects, and Health Aspects. The preliminary draft of the Online Class Environment scale was prepared with 50 statements and it was subjected to test the discrimination ability of its statements' by using a t-test to the random sample of 393 higher secondary school students. The 42 statements were retained which possessed equal and greater than the critical value of 1.75 and all others were not retained. The face and content validity were found and the reliability of the tool is found to be 0.79 by using Chronbach's alpha formula. The norm of the Online Class Environment scale was established and the tool is said to be standardized.

Keywords: Online Class Environment, Preliminary Survey, Validity, Reliability and Norms

INTRODUCTION

Internet technologies, which have become one of the most common ways to access information, have an impact on educational systems and teaching-learning activities. Many studies are currently being conducted to ensure the effectiveness and efficiency of online learning, which fills a critical educational gap. Presentation of multimediaenhanced lesson content in online learning environments, synchronous and asynchronous use of online communication tools, and time- and space-independent service to students are all important characteristics of online learning. Moreover, e-learning environments have the quality of enabling various communication technologies that can be used on independent platforms to be used together (Onal and Ibili, 2017). If individuals who utilize these environments have access to online learning lesson content and possess the skills of time management and use of the relevant technologies, this will have a positive effect on their academic success (Taipjutorus, Hansen, & Brown). Only psychological variables can reveal or explain beliefs about one's ability to perform these tasks.

A preliminary survey helps a researcher to test the measuring ability and qualities of a research tool(s) that has/have been constructed by the researcher. It is also called a pilot study, pilot experiment, small-scale preliminary study, and pilot project. It assists to find out the feasibility of a tool. A preliminary survey is a survey that is a miniature form of a final survey. A study conducted by adopting a non-piloted tool is merely a loss of time, money, and energy of the researcher. A preliminary survey is essential in this regard and assists to produce a good quality tool.

Development and Standardization of Online Class Environment Scale (OCES):

A tool is a device that collects data or information about a person's or a group's attributes or characteristics, as well as issues relating to society, systems, and so on. It is an essential duty of the researcher that developing a good quality tool and it is a more difficult task for the researcher. The Online Class Environment Scale has been developed and standardized by the investigator and the research supervisor. The development and standardization process of OCES includes different stages and its steps are sub- divided into steps. The stages and steps involving in the development and standardization process of OCES are discussed below.

The four stages of the development and standardization process of OCES are:

- ✓ Stage of Developing Statements,
- ✓ Stage of Try Out,
- ✓ Stage of Analyzing the Statements/Items
- ✓ Stage of Standardization

Each stage includes different steps and they are discussed in the succeeding passages.



STAGE OF DEVELOPING STATEMENTS:

Developing a statement is a focused work of a researcher who has formulated each item that should be reflected the dimensions and converge the focus point of the topic of a tool. This stage is more important than the foundation of a building, in which, planning the building, make a blueprint, and build according to it. Alike, the same processes have to be executed in tool development. The steps involved in this stage are briefly explained below.

Planning the Tool

Planning is the base layer of developing a tool and it is more powerful to successfulness outcome of a good research tool. Planning makes proper arrangements of dimensions as well as the statements/items. Planning includes the following:

> *Planning the Tool Type:* In planning a tool type is most important in which what type of tool is helpful to measure the variable and it has to be decided by a researcher. There are different forms of tools are available like questionnaires, scale, opinionnaire, checklist, battery, inventory, etc. Here, the investigator confirmed that the scale is appropriate for measuring the online class environment.

> Planning the Number of Statements/ Items: Planning in all aspects makes ensures quality. The number of items fixed in the tool is very important because it saves time to measure variables. A variable can be measured in one statement/item (e.g.: demographic variable like gender, locality, etc) and some variables cannot be measured in a single statement/item (e.g.: intelligence, emotional intelligence, etc.). Here the researcher is going to measure Online Class Environment and it cannot be measured through a single statement and so the researcher has fixed it certainly to 50.

 \succ *Planning the Dimensions*: Generally, a variable in social sciences can be measured through one and more dimensions. The researcher is ready to measure the Online Class Environment of the student and so the different styles become dimensions. The researcher has fixed six dimensions and they are:

- Interest
- Family Environment
- Technology in teaching -learning
- Evaluation
- Health aspects
- Psychological aspects

Table 1 indicates the number of statements developed in each dimension and its sub-dimensions of OCES.

Sl. No.	Dimension	Number of Statement		
		Positive	Negative	Total
1.	Interest	6	2	8
2.	Family Environment	6	2	8
3.	Technology in teaching –learning	6	2	8
4.	Evaluation	7	2	9
5.	Health Aspects	6	2	8
6.	Psychological Aspects	6	3	9
	Total	37	13	50

Based on the number of statements concerning each dimension, the preliminary form was developed and it is described below.

DEVELOPMENT OF PRELIMINARY DRAFT:

During the development of the preliminary form, the researcher should focus like the bridle of the horse in writing statements that reflect the dimension, and also ensures the fitness of the dimensions and focused on the



title of the scale. The preliminary draft was prepared with 50 statements having five ratings with Strongly Agree, Agree, Undecided, Disagree, and Strongly Disagree. Suresh and Srinivasan (2020) emphasize that the investigator keeps attention with the following while preparing the preliminary form and it was followed by the investigator while preparing the preliminary draft.

- The direct meaning of the question,
- Removing the irrelevant questions,
- Checking the unambiguous questions,
- Repetition of the questions,
- Indirect questions,
- Double-barreled questions, and
- Blind questions.

The scores for Strongly Agree is 5, Agree is 4, Undecided is 3, Disagree is 2, and Strongly Disagree is 1 for Positive Statements. The Scores for Strongly Agree is 1, Agree is 2, Undecided is 3, Disagree is 4, and Strongly Disagree is 5 for the negative statements.

STAGE OF TRYOUT

This stage assists the researcher to find out the organization, structure, fitness, length, and meaning of the statements in a preliminary draft. The preliminary draft and its dimensions details are sent to two associate professors, one headmaster, and three school teachers for finding the organization, structure, fitness, length, and meaning of the statements. The OCES was further refined regarding the subject experts' feedback.

STAGE OF ANALYZING THE STATEMENT/ITEM

After refining the preliminary draft is over, the statements are ready to check the discrimination ability. A good statement has the quality to discriminate the higher performer from the lower performer and for this purpose, the item analysis is executed by the investigator. The stage of analyzing the statement is performed with the following steps.

PRELIMINARY SURVEY

A random sample of 393 higher secondary school students from Thanjavur District, Tamil Nadu, India were given the refined OCES. The students are permitted to respond to the OCES for 45 minutes. Before beginning the administration process, the researcher describes the tool and its research purpose, as well as assuring that the data will be used solely for research purposes. The response OCES were checked that all the statements are responded to before collecting it. The researcher prepared a master table for each statement after the scoring scale is over.

ITEM ANALYSIS

A table was prepared with the responder's names and their responses towards each item. The responses were recorded in an MS Excel sheet according to the scoring procedure mentioned in head. The responders were sorted from higher marks to lower marks. The statements for the final analysis were chosen based on an item analysis of each statement, as suggested by Edward (1957), the 27% of top scorers from the top of the table is considered as 'Upper Group or High Group' and the 27% of low achiever from the least of the table is considered as 'Low Group' and between them is considered as 'Middle Group' (as cited in Garrett, 2014). The 27% of sample 393 is 106 and so the 106 students from the top are considered as high achievers and the 106 students from the bottom are considered as low achievers. According to Edward (1957), the statement that possesses equal or higher than the critical t-value of 1.75 is only be retained all others are not retained (as cited in Garrett, 2014). The details of the selection and rejection of items are given in table 1.

Item No.	t - Value	Item Status (Selected/Rejected)
1	2.93	Selected
2	2.69	Selected
3	1.14	Rejected
4	2.19	Selected
5	2.25	Selected

Table 1 Item Status of OCLS	Table 1	Item	Status	of	OCES
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0	2.50	Selected	
7	2.51	Selected	
8	1.75	Selected	
9	1.97	Selected	
10	1.88	Selected	
11	1.79	Selected	
12	1.13	Rejected	
13	2.33	Selected	
14	3.01	Selected	
15	1.86	Selected	
16	2.77	Selected	
17	2.19	Selected	
18	2.13	Selected	
19	2.92	Selected	
20	1.82	Selected	
21	2.53	Selected	
22	3.03	Selected	
23	1.39	Rejected	
24	1.90	Selected	
25	1.76	Selected	
26	4.38	Selected	
27	2.16	Selected	
28	2.08	Selected	
29	1.42	Rejected	
30	1.86	Selected	
31	2.36	Selected	
		~ 1 1	
32	2.94	Selected	
32 33	2.94 1.28	Selected Rejected	
32 33 34	2.94 1.28 4.37	Rejected Rejected Selected	
32 33 34 35	2.94 1.28 4.37 2.48	Selected Rejected Selected Selected	
32 33 34 35 36	2.94 1.28 4.37 2.48 1.93	Selected Rejected Selected Selected Selected	
32 33 34 35 36 37	2.94 1.28 4.37 2.48 1.93 1.85	Selected Rejected Selected Selected Selected Selected Selected	
32 33 34 35 36 37 38	2.94 1.28 4.37 2.48 1.93 1.85 1.92	Selected Rejected Selected Selected Selected Selected Selected Selected Selected	
32 33 34 35 36 37 38 39	2.94 1.28 4.37 2.48 1.93 1.85 1.92 3.78	Selected Rejected Selected	
32 33 34 35 36 37 38 39 40	2.94 1.28 4.37 2.48 1.93 1.85 1.92 3.78 2.21	Selected Rejected Selected	
32 33 34 35 36 37 38 39 40 41	2.94 1.28 4.37 2.48 1.93 1.85 1.92 3.78 2.21 1.32	Selected Rejected Selected	
32 33 34 35 36 37 38 39 40 41 41 42	2.94 1.28 4.37 2.48 1.93 1.85 1.92 3.78 2.21 1.32 2.23	Selected Rejected Selected	
$ \begin{array}{r} 32 \\ 33 \\ 34 \\ 35 \\ 36 \\ 37 \\ 38 \\ 39 \\ 40 \\ 41 \\ 42 \\ 43 \\ \end{array} $	2.94 1.28 4.37 2.48 1.93 1.85 1.92 3.78 2.21 1.32 2.23 3.14	Selected Rejected Selected	
$ \begin{array}{r} 32 \\ 33 \\ 34 \\ 35 \\ 36 \\ 37 \\ 38 \\ 39 \\ 40 \\ 41 \\ 42 \\ 43 \\ 44 \\ \end{array} $	2.94 1.28 4.37 2.48 1.93 1.85 1.92 3.78 2.21 1.32 2.23 3.14 0.95	Selected Rejected Selected Rejected Selected Selected	
$ \begin{array}{r} 32 \\ 33 \\ 34 \\ 35 \\ 36 \\ 37 \\ 38 \\ 39 \\ 40 \\ 41 \\ 42 \\ 43 \\ 44 \\ 45 \\ \end{array} $	2.94 1.28 4.37 2.48 1.93 1.85 1.92 3.78 2.21 1.32 2.23 3.14 0.95 2.09	Selected Rejected Selected Rejected Selected Selected Selected Selected	
$ \begin{array}{r} 32\\ 32\\ 33\\ 34\\ 35\\ 36\\ 37\\ 38\\ 39\\ 40\\ 41\\ 42\\ 43\\ 44\\ 45\\ 46\\ \end{array} $	2.94 1.28 4.37 2.48 1.93 1.85 1.92 3.78 2.21 1.32 2.23 3.14 0.95 2.09 2.82	Selected Rejected Selected	
$ \begin{array}{r} 32 \\ 33 \\ 34 \\ 35 \\ 36 \\ 37 \\ 38 \\ 39 \\ 40 \\ 41 \\ 42 \\ 43 \\ 44 \\ 45 \\ 46 \\ 47 \\ \end{array} $	2.94 1.28 4.37 2.48 1.93 1.85 1.92 3.78 2.21 1.32 2.23 3.14 0.95 2.09 2.82 2.69	Selected Rejected Selected	
$ \begin{array}{r} 32\\ 32\\ 33\\ 34\\ 35\\ 36\\ 37\\ 38\\ 39\\ 40\\ 41\\ 42\\ 43\\ 44\\ 45\\ 46\\ 47\\ 42 $	2.94 1.28 4.37 2.48 1.93 1.85 1.92 3.78 2.21 1.32 2.23 3.14 0.95 2.09 2.82 2.69	Selected Rejected Selected	
$ \begin{array}{r} 32\\ 32\\ 33\\ 34\\ 35\\ 36\\ 37\\ 38\\ 39\\ 40\\ 41\\ 42\\ 43\\ 44\\ 45\\ 46\\ 47\\ 48\\ \end{array} $	2.94 1.28 4.37 2.48 1.93 1.85 1.92 3.78 2.21 1.32 2.23 3.14 0.95 2.09 2.82 2.69 2.64	Selected Rejected Selected Selected	
$\begin{array}{c} 32 \\ 32 \\ 33 \\ 34 \\ 35 \\ 36 \\ 37 \\ 38 \\ 39 \\ 40 \\ 41 \\ 42 \\ 43 \\ 44 \\ 45 \\ 44 \\ 45 \\ 46 \\ 47 \\ 48 \\ 49 \\ \end{array}$	2.94 1.28 4.37 2.48 1.93 1.85 1.92 3.78 2.21 1.32 2.23 3.14 0.95 2.09 2.82 2.69 2.64 1.24	Selected Rejected Selected Selected	

STAGE OF STANDARDIZATION

The standardization process proceeded with different steps such as the development of the final draft, qualities of OCES, scoring procedure, and norms creation. Each step of standardization of OCES is explained below.



DEVELOPMENT OF FINAL DRAFT:

Based on the item analysis, the final draft was comprised of 42 items and the other 8 are rejected due to not reach the minimum of critical t-value (1.75). In the selection of items in each dimension are Interest is 07, Family Environment is 07, Technology in Teaching-Learning is 07, Evaluation is 07, Health Aspect is 07 and Psychological aspects is 07. Table 2 indicates the items selected for the final draft.

Sl. No.	Dimension	Number of Statement		
		Positive	Negative	Total
1.	Interest	5	2	7
2.	Family Environment	5	2	7
3.	Technology in teaching –learning	5	2	7
4.	Evaluation	5	2	7
5.	Health Aspects	5	2	7
6.	Psychological Aspects	5	2	7
	Total	30	12	42

QUALITIES OF OCES

Quality is essentially important for any type of research tool because it is evident that how the tool measures the variable is valid and reliable. So, the investigator has the responsibility to describe the quality of the OCES by briefing the validity and reliability in this session. The OCES has the following qualities and they are briefed below.

RELIABILITY

The degree to which an assessment tool produces stable and consistent results is known as reliability. The degree of consistency among test scores is referred to as reliability, according to Mehraj A. Bhat in 2014. The Alpha Cronbach Coefficient was used to assess the test's reliability. Using the Chronbach's Alpha formula, the OCES's reliability is found to be 0.79.

VALIDITY

A data collection tool must provide data that is not only relevant but also free of systematic errors. To put it another way, it must only produce reliable data and measure what it claims to measure. For OCES, the following validity was established.

Face Validity

Face validity considers how appropriate a test's content appears on the surface. Face validity is similar to content validity, but it is a more informal and subjective evaluation. Face validity is often regarded as the weakest form of validity because it is a subjective measure. It can, however, be useful in the early stages of developing a method. With the help of subject experts, this validity is established. The OCES was sent to a panel of experts for review, with the goal of determining the measurability of each statement and its dimensions on the Online Class Environment. The experts' suggestions were incorporated into the scale, giving the OCES face validity.

Content Validity

The term "content validity" refers to the tool's coverage of the topic of Online Class Environment and its dimensions as items. The degree to which items in an instrument reflect the content universe to which the instrument will be generalized is referred to as content validity (Straub, Boudreau et al. 2004). The scale includes six online class environments such as Interest, Family Environment, Technology in Teaching-Learning, Evaluation, Health Aspect and Psychological aspects. The subject experts requested to check the items of each dimension to cover all its sub-dimensions. The subject experts suggested that all the items in the dimensions are covered the content of the dimensions and hence the OCES has content validity.



SCORING PROCEDURE OF OCES

Wrong scoring leads to wrong results and giving scoring procedure is the duty of the tool constructor. The investigator has given the scoring procedure of OCES in table 3

Table 3 Scoring Procedure of OCES

	Scoring			
Response Type	Positive Item	Negative Item		
Strongly Agree	5	1		
Agree	4	2		
Undecided	3	3		
Disagree	2	4		
Strongly Disagree	1	5		

NORMS FOR OCES

Norms are used to compare the scores to normal scores (Suresh & Srinivasan, 2017). Establishing norms is a complex process for the tool developer because the data has to be assumed in fitting with the Normal Probability Curve (NPC). The range of the score is 7 to 35 in each dimension. Based on the dimensions, the norms have been established as follows

Table 2 Norms of OCES

Scores in Dimension		Description		
	Below 12	Low Preference to Interest		
Interest	13 - 24	Average Preference to Interest		
	Above 24	High Preference to Interest		
	Below 12	Low Preference to Family Environment		
Family Environment	13 - 24	Average Preference to Family Environment		
	Above 24	High Preference to Family Environment		
	Below 12	Low Preference to Technology in teaching -learning		
Technology in teaching learning	-13 - 24	Average Preference to Technology in teaching -learning		
	Above 24	High Preference to Technology in teaching -learning		
	Below 12	Low Preference to Evaluation		
Evaluation	13 - 24	Average Preference to Evaluation		
	Above 24	High Preference to Evaluation		
	Below 12	Low Preference to Psychological aspects		
Health Aspects	13 - 24	Average Preference to Psychological aspects		
	Above 24	High Preference to Psychological aspects		
	Below 12	Low Preference to Health Aspects		



Psychological Aspects	13 - 24	Average Preference to Health Aspects
	Above 24	High Preference to Health Aspects

CONCLUSION

The term "online class environment" refers to a learning environment that takes place online or virtually rather than in person. It takes a lot of discipline and commitment to succeed in an online class learning environment. Students in online classes must adhere to a course schedule and complete weekly tasks and assignments. As a result, effective time management and study skills are required for online learning.

ICT alone does not improve teaching and learning; it improves when it is grounded in practical learning theory. As we use more e-learning, it's critical that we have opportunities to reflect on models of best practice based on practical learning theory. It is difficult for teachers to provide the best learning outcomes for their students without such opportunities. The current study is noteworthy because it involved the validation and implementation of an online learning environment instrument that provides feedback on students' perceptions of the online learning environment and can be used to guide reflective practice.

Because the OLES has the ability to provide users with data that depicts the actual and preferred learning environments of students and teachers in real time, providing instructors working in these environments with immediate and potentially valuable feedback. Such information can then be used to facilitate an open dialogue between the teacher and students to determine how they can collaborate to improve their online learning environment by guiding educational decision-making. The current study is also significant because it shows how learning environment research tools like the OLES can aid in evaluating the effectiveness of online learning environments. Students' perceptions of the psychosocial characteristics of their learning environments and their learning outcomes have been linked in previous studies (Fraser, 1998). The current study is significant because it used the OLES to investigate how educators can improve their online learning environments based on their students' perceptions, thereby improving student outcomes.

The investigator has developed the Online Class Environment scale with 50 statements in the preliminary draft. After the item analysis, the final draft was constituted with 42 items. The face and content validity were found and the reliability of the tool is found to be 0.79 by using Chronbach's alpha formula. The norms of the Online Class Environment scale were established and hence the tool is said to be standardized.

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