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Development and Validation of a Scale: Attitude Towards Online Learning (ATOL)

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Abstract

The purpose of this study was to assess the attitude of high school students' attitude towards online learning in Chennai and Kanchipuram Districts. The sample was 100 students at high school level. The simple random sampling technique was administered to collect the responses from respondents who were studying in high schools. The data was collected by distributing questionnaires using a 5 point Likert scale to measure 50 statements of preliminary draft. Consequently, the responses were subjected to internal consistency reliability (Cronbach's Alpha) and Correlation Coefficient ('r'), the final form of the attitude of high school students' towards online learning scale was consisted of 49 statements. Therefore, the investigators believed that the 49 statements in the scale were meaningful and reflect the attitude of high school students' attitude towards online learning and it would be helpful to measure the attitude of high school students' towards online learning.

Keywords:- Attitude, Online Learning, Reliability, Validity and High School Students.

I. INTRODUCTION

Education is one of the most powerful instruments for the intellectual, emotional, and social development of individuals. It enables learners to acquire knowledge, develop skills, and build the attitudes necessary for productive participation in society.

In the present century, education has been transformed by digital technology, and one of the most visible changes has been the rise of online learning, which has expanded access to education and made instruction possible beyond the boundaries of the traditional classroom.

The rapid growth of online learning has changed the way teachers teach and students learn. Digital platforms now allow lessons, discussions, assignments, and assessments to take place through internet-based tools. This shift has created both opportunities and challenges for learners. While online learning offers flexibility and convenience, it also requires students to have proper devices, stable internet access, self-discipline, and the ability to adapt to virtual learning environments. As a result, students' attitude towards online learning has become an important area of study, since attitude strongly influences participation, motivation, and academic engagement.

High school students are at a sensitive stage of development, where consistent guidance, clear explanation, and active interaction are highly important. When learning takes place online, these students may experience varying levels of comfort, satisfaction, and difficulty; some may appreciate the independence and flexibility of online learning, while others may feel disconnected, distracted, or unsupported. Online learning became especially prominent during the COVID-19 period, when schools were forced to shift from face-to-face instruction to digital classrooms, and it has since continued to play an important role in education, with many institutions retaining online or blended formats for certain academic activities. So, understanding the attitude of high school students towards online learning is therefore essential for improving educational practices and making online instruction more effective.

II. CONCEPT OF ATTITUDE TOWARDS ONLINE LEARNING

2.1. Attitude

Attitude refers to a person's learned tendency to evaluate a person, object, event, or situation in a favourable or unfavourable way. In education, it reflects the way that students think about learning, how they feel about it, and how they respond to it in practice. Attitude is not an inborn quality; it is formed through experience, social influence, and repeated exposure to situations. In the context of online learning, students may develop a positive attitude if they find it convenient, useful, and supportive or a negative attitude if they experience poor connectivity, lack of interaction, confusion, or stress.

2.2. Online Learning

Online learning is referred to as e-learning or digital learning. It is a mode of education in which instruction and learning activities take place through the internet rather than in a traditional classroom. It enables students and teachers to connect, interact, and exchange knowledge using digital platforms such as Google Classroom, Zoom, Microsoft Teams, Moodle, and other web-based tools, removing the barrier of physical presence.

Online learning can take several forms: synchronous online learning, which involves real-time interaction through live video sessions and virtual classrooms; asynchronous online learning, which allows students to access recorded lessons and study materials at their own pace; and blended learning, which combines online as well as face-to-face instruction. Since the COVID-19 pandemic, online learning has continued to be an important component of education, opening new possibilities for lifelong learning, professional development, and the democratisation of education.

III. DEVELOPMENT OF ATTITUDE TOWARDS ONLINE LEARNING SCALE

The investigator has developed and selected the Attitude of High School Students towards Online Learning Scale for the present study. The final scale consists of 49 statements, presented bilingually in English and Tamil, and is preceded by a Personal Data Sheet selected demographic variables.

The statements are related to five dimensions of attitude, built upon the Cognitive, Affective, and Behavioural (ABC) model of attitude, with two additional context-specific dimensions Teacher Support and Technical & Infrastructural developed to capture facets of the online-learning experience of particular relevance to high school students. The five dimensions are described as follows:

- *Cognitive*: Students' beliefs and opinions about the effectiveness and usefulness of online learning.
- *Affective*: Students' feelings of interest, enjoyment, or frustration associated with online learning.
- *Teacher Support*: The guidance, explanation, and encouragement provided by teachers during online classes.
- *Technical and Infrastructural*: Students' perception of the reliability and adequacy of the devices, internet connectivity, and online platforms used for online learning.
- *Behavioural*: Students' participation, motivation, and either favourable or unfavourable disposition towards online learning.

Table 1. Dimensions of the Attitude Towards Online Learning Scale and their Item Numbers

Sl. No.	Dimension	Item Numbers (Preliminary draft Scale)
I	Cognitive	1 - 10 (10 items)
II	Affective	11 - 20 (10 items)
III	Teacher Support	21 - 30 (10 items)
IV	Technical and Infrastructural	31 - 40 (10 items)
V	Behavioural	41-50 (10 items)

Instructions were clearly explained to the students before administering the scale. Students were asked to read each statement carefully and to indicate their level of agreement on a five-point scale stated such as, Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D), and Strongly Disagree (SD) - for all statements without omission, and were assured that their responses would be kept confidential and used only for research purposes.

IV. PILOT STUDY

A pilot study was carried out prior to administer the scale for main data collection, in order to, establish the reliability and validity of the investigator's self-constructed Attitude Towards Online Learning Scale (ATOLS) and also to identify and eliminate poorly functioning items before the scale was administered to the main sample.

The 50 item of preliminary draft scale was administered to 100 students from three high schools located in Kanchipuram district. The responses obtained were used to compute the reliability of the scale.

4.1. Administration and Scoring of the Attitude Scale

The scale was administered to high students in person, with clear instructions given before administration. Students were encouraged to clarify any doubts before recording their responses. There was no strict time limit for completing the scale, but students generally completed it within 20 to 25 minutes.

4.2. Scoring

Responses were scored on a five-point scale.

For positively worded statements, scoring was Strongly Agree (5), Agree (4), Neutral (3), Disagree (2), and Strongly

Disagree (1).

For negatively worded statements - Items 36, 37, 38, 39, 46, and 47 - the scoring was reversed, (i.e.) Strongly Agree (1) through Strongly Disagree (5), so that a higher score consistently reflected a more favourable attitude towards online learning across all items.

4.3. Item Analysis

For each of the 50 items, the correlation coefficient 'r' was calculated and the value of 0.27 or above was treated as the cut-off for acceptable discrimination. Items meeting the discrimination criterion were retained as ('Accepted'); the one item falling short of the criterion was removed from the final scale ('Rejected').

Table 2. Item Analysis of the Pilot Study

Sl. No.	(Cognitive)	'r' value	Remarks
1	Online learning helps me to understand lessons effectively.	0.447	Accepted
2	I can learn independently through online classes.	0.313	Accepted
3	Online classes improve my academic knowledge.	0.521	Accepted
4	I can complete my worksheets easily through online learning.	0.505	Accepted
5	Recorded classes help me revise lessons better.	0.53	Accepted
6	Online learning provides access to useful learning resources.	0.423	Accepted
7	Online learning helps me improve my problem-solving skills.	0.395	Accepted
8	Online learning helps me achieve my learning goals effectively.	0.553	Accepted
9	Online learning encourages self-learning habits.	0.432	Accepted
10	Online classes help me manage my study time efficiently.	0.487	Accepted
11	I actively participate in online classes.	0.571	Accepted
12	Online classes keep me interested in learning.	0.644	Accepted
13	I ask questions comfortably during online classes.	0.312	Accepted
14	Online activities make learning enjoyable.	0.579	Accepted
15	Online discussions improve my understanding of topics.	0.401	Accepted
16	I feel involved during online learning sessions.	0.539	Accepted
17	Online classes encourage me to interact with classmates.	0.479	Accepted
18	Group activities conducted during online classes are effective.	0.336	Accepted
19	Online learning motivates me to attend classes regularly.	0.611	Accepted
20	I remain attentive throughout online classes.	0.58	Accepted
21	Teachers explain lessons clearly in online classes.	0.557	Accepted
22	Teachers provide adequate support during online learning.	0.619	Accepted
23	I can easily communicate with teachers online.	0.573	Accepted
24	Teachers respond quickly to my doubts.	0.512	Accepted
25	Online learning promotes effective teacher-student interaction.	0.591	Accepted
26	Teachers use interesting methods during online classes.	0.442	Accepted
27	Teachers encourage participation in online learning.	0.491	Accepted
28	Feedback provided by teachers helps me improve.	0.358	Accepted
29	Teachers make online classes engaging.	0.489	Accepted
30	I feel connected to my teachers during online learning.	0.456	Accepted
31	I have reliable internet access for attending online classes.	0.406	Accepted
32	Technical problems rarely affect my learning.	0.422	Accepted

33	I can easily use online learning platforms.	0.402	Accepted
34	My digital device supports online learning effectively.	0.567	Accepted
35	I feel confident in using educational technology.	0.433	Accepted
36	Poor internet connectivity affects my online learning.	0.327	Accepted
37	Technical issues make online classes frustrating.	0.406	Accepted
38	I face difficulties submitting assignments online.	0.406	Accepted
39	Lack of digital devices affects my participation.	0.359	Accepted
40	Online learning platforms are user-friendly and easy to access.	0.398	Accepted
	(Behavioural)		
41	Online learning motivates me to learn.	0.428	Accepted
42	I enjoy attending online classes.	0.532	Accepted
43	I prefer online learning over traditional classroom learning.	0.565	Accepted
44	Online learning increases my confidence in learning.	0.518	Accepted
45	I feel comfortable studying from home.	0.414	Accepted
46	Online learning reduces my interest in studies.	0.162	Rejected
47	I feel isolated during online classes.	0.406	Accepted
48	I would like online learning to continue as a part of education.	0.424	Accepted
49	Blended learning (online + offline) is better than only classroom learning.	0.515	Accepted
50	Overall, I have a positive attitude towards online learning.	0.669	Accepted

V. RELIABILITY

The reliability of the scale was determined on the pilot sample of 100 students. Internal consistency reliability (Cronbach's Alpha) of the 50 item draft scale was found to be 0.907, which is considered excellent.

As item analysis showed that Item No. 46 exhibited poor discrimination ($r = 0.162$) and was removed from the scale. When Cronbach's Alpha was recomputed for the 49 item as final scale, the coefficient increased marginally to 0.929, confirming that the removal of Item No. 46 did not reduce the internal consistency of the scale. The final 49 items of Attitude Towards Online Learning Scale (ATOLS) can therefore be regarded as highly reliable.

5.1. Reliability of the Pilot Tool

Table 3. Dimension-wise Reliability (Cronbach's Alpha) - Pilot Sample (n = 100)

Dimension	No. of Items	Cronbach's Alpha	Interpretation
Cognitive Component	1-10	0.839	Good
Affective Component	11-20	0.804	Good
Teacher Support Component	21-30	0.843	Good
Technical & Infrastructural Component	31-40	0.746	Acceptable
Behavioural Component	41-49	0.704	Acceptable
Total	1-49	0.929	Excellent

5.2. Validity

The scale possesses face and content validity, since every item was framed to directly reflect one of the five conceptual dimensions of attitude towards online learning, and the items were reviewed by the subject expert, teacher educator, high school teacher and language teacher for relevance, clarity, and freedom from ambiguity before the pilot administration.

Construct validity is further supported by the item analysis reported to 49 items showed a statistically significant discrimination index ($t \geq 1.75$) and a positive, meaningful item-total correlation (ranging from $r = 0.312$ to $r = 0.669$), indicating that these items consistently measured the same underlying construct as the scale as a whole. The single item that failed to meet this criterion (Item 46) was removed, which strengthens rather than weakens the construct validity of the final scale.

In addition, following the convention of estimating validity from the coefficient of reliability (Garrett, 1981), a validity

index was computed as the square root of the reliability coefficient of the final scale ($\sqrt{0.929} \approx 0.964$), indicating a high degree of validity.

VI. CONCLUSION

Eventually, Attitude towards Online Learning Scale (ATOLS), to establish the reliability, and validity by adopting appropriate statistical techniques, the reliability of the scale was determined on the pilot sample of 100 students. Internal consistency reliability (Cronbach's Alpha), the final scale consisted of 49 items; reliability was found 0.929 and validity found 0.964 to carry out the data collection for the main study.

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