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Teaching Through Digital Media: Acceptance and use of Technology Among the High School Teachers for Inclusive Education in Kerala During the Covid-19 Pandemic

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Abstract

Objective: The present study applies the Unified Theory of Acceptance and Use of Technology to assess the user intentions and subsequent use of digital media among high school teachers to provide inclusive education in Kerala during the COVID-19 pandemic. **Methods:** An online survey was conducted using purposive sampling; 394 responses were collected from high school teachers at various levels and age groups, who were mostly reported to be utilizing Google Meet, WhatsApp, Zoom, and Skype for teaching. As the data were not normally distributed, non-parametric tests, including the Mann-Whitney U test and Kruskal-Wallis H test, were performed to investigate the extent of digital media use among high school teachers across categories of gender, age, type of school, average monthly income, locality, and relationship status. Spearman's Rank Order correlation coefficient was calculated to examine the relationship between various components of digital media use among the participants. **Findings:** The study explored that most teachers are using digital platforms extensively for online teaching, depending on the available digital facilities and digital literacy of the teachers and the students and the availability of IT support from the schools. Descriptive measures demonstrated that the most commonly used digital media app among high school teachers is Google meet (87.1%) followed by WhatsApp (79.7%). Pairwise comparisons significantly higher PE, EE, UB, SI, FC, and total technology use among participants below 39 years (p<.01). Government school teachers were found to have higher scores for UTAUT variables; except for BI, which was higher among unaided school teachers (p<.01). Engaged participants were found to have higher UB and total digital use when compared to married and single participants (p<.01). Spearman's rank-order correlation suggested

a significant positive correlation amongst the UTAUT variables; total digital use was positively correlated with all the components (p<.01). **Novelty:** The study has incorporated the Unified Theory of Acceptance (UTAUT) in an attempt to uncover the role of digital media in facilitating inclusive education during the covid-19 pandemic. Both descriptive and inferential statistical measures are employed to provide an objective stance on the education trends and educator practices brought in by the 'new normal.'

Keywords: COVID19; High School Teachers; Inclusive Education; Unified Theory of Acceptance and Use of Technology (UTAUT); Digital Media

1 Introduction

Kerala is regarded as India's first digital state and has the largest proportion of internet-connected homes in the country (51%) and households with computers (24%), as well as the highest mobile phone penetration (95%), smartphone penetration (62%), and digital literacy (75%). Kerala has long served as an example of early digital technology adoption in education and healthcare[1]. Due to the COVID-19 pandemic, schools had to close, which led to new ways to use ICT for distance learning. However, not everyone was able to use them, children with disabilities, especially girls, were mostly left behind[2].

Technology makes the classroom environment more invigorating with the use of audiovisual aids, talking calculators, modern software, and apps that help children overcome challenges in a streamlined pattern without discrimination[3]. Even having a digital gadget with internet connectivity did not guarantee that children would have sufficient access to virtual learning[4]. The statistics show a lack of agreement on the potential advantages of digital inclusion for students with intellectual impairments, which is based on the idea that the online world is unsafe for this demographic[5].

The Digital Education Index for Developing Countries (DEIFDC) score indicates inadequate digital education deployment, which is primarily caused by subpar school infrastructure, limited pedagogical capabilities, and modest student skills[6]. So, equity concerns, realities, teachers' views on effective online instruction and how well they help students learn in virtual settings are important. These things are vital for policymakers and other stakeholders to think about when deciding where education is going and how to help teachers do their jobs[7].

Along with these concerns, the existing dearth of studies in Kerala and the proven strength of the Unified Theory of Acceptance and Use of Technology (UTAUT) emerged a need to assess high school teacher's user intentions and subsequent use of digital media among high school teachers to provide inclusive education. To study this there are four research questions employed for the study What is the extent of acceptance and use of digital technology among high school teachers during COVID-19? What prominent digital media platforms were used for teaching during COVID-19? Is there any difference in the acceptance and use of digital technology among the teachers concerning gender, age, type of school, average monthly income, relationship status, and locality? Does a significant relationship exist between various acceptance and digital technology components? Due to a lack of resources and time, the study was limited to high schools but necessitated covering the entire education system.

The Unified Theory of Acceptance and Use of Technology (UTAUT) was developed by Venkatesh, Michael G. Morris, Gordon B. Davis, and Fred D. Davis in their work "User Acceptance of Information Technology: Toward a Unified View." The core aim of this theory is to understand human acceptance behaviour and user intentions to use an information system or new technology (12). The constructs Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC) determine user intentions to use an information system and construct Behavioral

Intentions (BI) and Use Behaviour (UB) determine the subsequent usage behaviour [8].

The six variables taken from UTAUT are

1. Performance Expectancy (PE) is "the degree to which an individual believes that using the system will help him or her to attain gains in job performance."

2. Effort Expectancy (EE) is "the degree of ease associated with using the system"

3. Social Influence (SI) is "the degree to which an individual feels the importance that others believe he or she should use the new system."

4. Facilitating Conditions (FC) are "the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system."

5. Behavioral Intentions (BI) are "the action/ efforts/ intention of using the technology." It can also be referred to as a motivational factor that can facilitate technology use, i.e., the higher the intention level, the higher the technology use can be predicted.

6. Use Behavior (UB) is "the attitude of using technology," it involves a continuous commitment to make use of technology, the amount of usage (use frequency), and quality of usage (use variety) of digital media for teaching.

2 Methodology

2.1 Instrument

The study employed a questionnaire based on Pasco's UTAUT model. The questionnaire consisted of 20 items, measuring PE (4 items), EE (3 items), SI (3 items), FC (4 items), BI (3 items), and UB (3 items) [9].

2.2 Sample

The researchers contacted District Institutes of Education and Training (DIET) centres in Kerala for obtaining the contact details of potential participants. Information regarding the study was communicated to the contacts obtained, and 394 high school teachers voluntarily participated in the online survey which was carried out from December 2021 - January 2022. The sample included representations from all 14 districts of Kerala.

2.3 Data analysis

As the data were not normally distributed, non-parametric tests, including the Mann-Whitney U test and Kruskal-Wallis H test, was performed to investigate the extent of digital media use among high school teachers across categories of gender, age, type of school, average monthly income, locality, and relationship status. Spearman's Rank Order Correlation Coefficient was calculated to examine the relationship between UTAUT components.
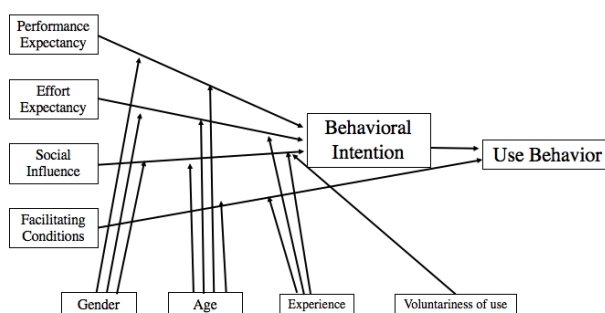

Fig 1. UTAUT Model

3 Results

Table 1 demonstrates the socio-demographic profile of the participants (n=394). Most participants were males (57.6%), aged between 30 and 49 (64.4%). Most of them were married (80.2%), employed either in government or aided schools (45.9% and

40.4% respectively), earned between Rs.30000 and Rs. 80,000 (73.6%), and hailed from rural (43.4%) localities.

Table 1. Socio-demographic profile of the participants (n=394)

Variable	Category	Frequency	Percentage
Gender	Male	227	57.6
	Female	167	42.4
Age	Below 30 years	59	15.0
	30 years - 39 years	144	36.5
	40 years - 49 years	110	27.9
	50 years - 59 years	77	19.5
	Above 60 years	4	1.0
Type of School	Government	181	45.9
	Aided	159	40.4
	Unaided	54	13.7
Average Monthly Income	Less than Rs.30000	56	14.2
	Rs.30000 - Rs.80000	290	73.6
	Above 80000	48	12.2
Relationship Status	Married	316	80.2
	Single	78	19.8
Locality	Rural	171	43.4
	Semi-Urban	116	29.4
	Urban	107	27.2

RQ 1: What is the extent of acceptance and use of digital technology among high school teachers during COVID-19?

Table 2 illustrates descriptive statistics showing the participants' extent of use and acceptance of digital technology. It is suggested that the extent of acceptance and use of digital technology for teaching was predominantly dependent on FC (Mean = 16.47, SD ± 1.90) and PE (Mean = 15.96, SD ± 1.54).

Table 2. Descriptive Statistics showing the use and acceptance of digital technology (n=394)

Variable	Range	Minimum	Maximum	Mean	SD
Performance Expectancy	14	6	20	15.96	1.54
Effort Expectancy	12	3	15	12.33	1.65
Use Behavior	12	3	15	12.34	1.58
Social Influence	9	6	15	12.22	1.50
Facilitating Conditions	13	7	20	16.47	1.90
Behavioral Intention	10	5	15	12.33	1.76

RQ 2: What are the prominent digital media platforms used for teaching during COVID-19?

As illustrated in Figure 2, the most widely used digital media app among high school teachers is Google meet (87.1%), followed by WhatsApp (79.7%). Around 41% of the participants used Zoom, 3.6% used skype, 1.8% used Google Duo, and 0.3% used WeChat. The remaining 21.6% of the participants used other digital platforms for teaching.

RQ 3: Is there any difference in the acceptance and use of digital technology among the teachers concerning gender, age, type of school, average monthly income, relationship status, and locality?

Mann-Whitney U test suggested a significant difference in PE, EE, UB, FC, BI, and total digital use ($p<.001$) across categories of gender. Males were found to have higher scores when compared to females. Kruskal-Wallis H Test indicated a significant difference in the scores of PE, EE, UB, SI, FC, and total digital use ($p\leq .001$) between participants belonging to different age groups, however, no significant difference was found on BI ($p=.066$). It is found that there is a significant difference in the use and acceptance of technology in PE, EE, UB, SI, FC, and total digital use among participants teaching in government, aided, and unaided schools ($p\leq .001$). The groups found a significant difference between user behavior ($p=.002$) and total digital use ($p=.013$) among married and single individuals. A significant difference was found in EE ($p=.05$) between rural, semi-urban, and urban localities participants. However, no significant difference is indicated in UTAUT components between different
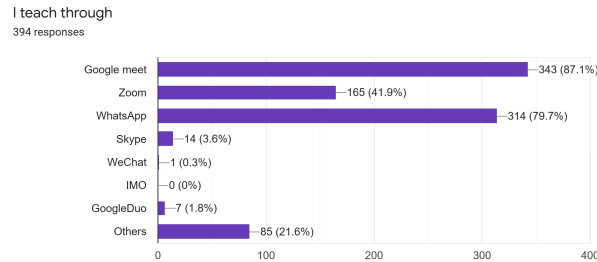
I teach through
394 responses

App	Count
Google meet	343 (87.1%)
Zoom	165 (41.9%)
WhatsApp	314 (79.7%)
Skype	14 (3.6%)
WeChat	1 (0.3%)
IMO	0 (0%)
GoogleDuo	7 (1.8%)
Others	85 (21.6%)

Fig 2. Digital Media Apps used by high school teachers

monthly income groups.

Post-hoc analysis

Dwass-Steel-Critchlow-Fligner (DSCF) pairwise comparisons suggested that participants below 30 years and 30 years - 39 years had significantly higher PE, EE, UB, SI, FC, and total technology use; when compared to the other groups (p<.01). Government school teachers were found to have higher scores for UTAUT variables; except for BI, which was higher among unaided school teachers (p<.01). Engaged participants were found to have higher UB and total digital use when compared to married and single participants (p<.01).

RQ 4: Does a significant relationship exist between various components of acceptance and use of digital technology?

Table 3 illustrates the results of Spearman's rank-order correlation between the UTAUT variables, including PE, EE, UB, SI, FC, BI, and total digital use. The analysis indicated a significant positive correlation amongst the UTAUT variables; total digital use was positively correlated with all the components (p<.01).

Table 3. Correlation between UTAUT Variables (performance expectancy, effort expectancy, use behavior, social influence, facilitating conditions, behavioral intentions, total digital use)

	Variable	1	2	3	4	5	6	7
1	Performance Expectancy	1	$.430^{**}$	$.380^{**}$	$.388^{**}$	$.407^{**}$	$.352^{**}$	$.643^{**}$
2	Effort Expectancy		1	$.393^{**}$	$.408^{**}$	$.511^{**}$	$.365^{**}$	$.676^{**}$
3	Use Behavior			1	$.382^{**}$	$.537^{**}$	$.443^{**}$	$.693^{**}$
4	Social Influence				1	$.418^{**}$	$.345^{**}$	$.652^{**}$
5	Facilitating Conditions					1	$.737^{**}$	$.852^{**}$
6	Behavioral Intention						1	$.776^{**}$
7	Total Digital Use							1

**p<.01

3.1 Summary of Analysis

Descriptive measures demonstrated that the most commonly used digital media app among high school teachers is Google meet (87.1%) followed by WhatsApp (79.7%). Social media-based online education advances students' cooperative learning and makes their relationships with teachers more formal, making it essential for student-centered education in the future as a support to the findings of Ganeshprabhu[10]. Inferential statistical analysis suggested a significant difference in the six variables of UTAUT among males and females. According to the results of Khechine[11], Males are very concerned about performance, but women are more concerned with usability and other people's perceptions which is allies with the findings of the paper with PE and contradicts with remaining variables i.e., EE, UB, SI, FC, and BI. Significant differences were found in PE, EE, UB, SI, FC, and total digital use, among participants of different age groups whereas the results of Nikolopoulou[12] with significant age difference were detected. Government school teachers were found to have high PE, EE, UB, SI, FC, and total digital use; however, BI was found to be high among unaided school teachers. A significant difference in the use and acceptance of technology based on relationship status was indicated. Single participants had higher UB, FC, and Total Digital Use than married participants. But the Married participants showed better PE and UB. A significant difference was found in EE between participants belonging

to rural, semi-urban, and urban localities. No significant difference was found in the user intentions and subsequent use of digital media between different income groups. Results also indicated a significant positive correlation between the UTAUT components which is associated with the finding of Gunasinghe [13] and Toe [14]. By explicitly stating that technology is necessary for both teaching and learning in their lectures, tutorials, and communication methods, teacher educators can encourage the use of technology in the classroom.

4 Conclusion

Most teachers used digital platforms extensively, and their online teaching depended on FC like digital resources, digital literacy, and the availability of IT support from the schools. These findings show that the teachers are very cooperative and eager to use digital media for their profession, and their practice can be enhanced by providing enough support. Most teachers used Google meet, WhatsApp, and Zoom; only 21.6% used other digital platforms such as Moodle, Google Classrooms, Microsoft Teams, CISCO - WebEx, Jio Meet, and MOOCs for teaching. Significant differences in PE, EE, UB, SI, FC, BI, and total digital use across categories of gender implied that male teachers are more digital-savvy than female teachers. All teachers, irrespective of their age groups, were found to have solid BI to use digital media for teaching. Compared to aided and unaided schools, government school teachers showed high potential to use digital platforms for teaching; however, BI was higher among unaided school teachers. Higher levels of performance among government school teachers indicate that the policy, funding, and strategies to promote the digitalization of schooling by the government of Kerala are in the right direction. The results of this study reflect no significant disparity between rural, semi-urban, and urban in terms of the accessibility of technology to the teachers, probably due to the achievements of the educational development of the state. The different monthly incomes of the teachers have not yielded any differences in the use of digital media, probably due to moderate salary conditions.

Prior experience with the usage of digital media for teaching and learning was not considered in the present study. Acquaintance with such strategies could have impacted the user intentions and subsequent use of digital platforms for teaching purposes. The study addressed teaching through digital media in a broader perspective, specific inquiry about the preferred utility, nature and scope of different teaching strategies etc. could have produced finer results.

Acknowledgment

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