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Faculty Preparedness to Adopt Technological Change during COVID-19 at Higher Education

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Abstract: The institution has been forced to close and shift from face-to-face teaching toward online teaching due to drastic changes in the shape of COVID-19. The teachers are at the forefront of the institution to successfully implement this technological transition. This study aimed to explore faculty preparedness to adopt online teaching based on gender. A total of 220 samples are drawn from a population of 1200 at public higher education institutions situated in Rawalpindi and Islamabad. Readiness instruments were tested using Cronbach alpha reliability analysis. The accurate value measured by the Cronbach Alpha coefficient was 0.84. The study findings were, the level of preparedness in the context of performance Expectancy as high as the mean score was 3.41 level of preparedness in the context of Effort Expectancy was high as the means score was 3.68 level of social influence was at a medium level as the means score was 3.05 level of facilitating conditions and Hedonic Motivation was low as compared to other factors as mean scores shown 2.58 and 2.28 according to the gender base analysis, the overall study found no significant differences in the analysis.

Key Words: Technology, COVID-19, Higher Education, Teachers, Online Teaching

Introduction

Over the last three decades, there have been several abrupt changes affecting every element of education worldwide. Thousands of institutes have been impacted by natural and abrupt change due to climate change and the recent catastrophic pandemic's technological sophistication. From the viewpoint of UNESCO (2020), COVID-19 is one of the greatest educational disrupted pandemics in history. More than 94 % of students' learning is affected over 194 nations. as a result of this pandemic. the learning system is suddenly changed to the virtual system also known as remote learning. as a result of significant changes to traditional teaching method practice which is using from home with a combination of technologies.

Disrupted educational change always moves to online education as the best alternative solution. since 19th century the experiences of online education has had significant technological experiences. (Paris France, 2020). Before the covid-19 pandemic, online education is a widespread way of instruction in higher education. Allama Iqbal Open University is a big example of online education in Pakistan. However, Remote learning has proven effective during the pandemic. During this critical phase, large-scale, nationwide efforts to use technology to assist online instruction are growing and evolving swiftly. (Alam & Tewari, 2020)

The world has become a global village due to social media. Knowledge and source of information is increasing day by day. Due to

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the swift expansion of information communication technology, the integration of education attracts a distinctive response and attention, especially in the aftermath of the COVID-19 epidemic. UNESCO mentioned in the research study, at the time of traditional transition, virtual instruction gave prompt responses using different tools for learning continuity (2020) every country has a different set of patterns to execute online education according to the policy and legislation. (Jiyang & Zhao, 2020) the priority of all governments around the world was to stop the disease enable uninterrupted learning, and eliminate educational inequity. (Tumwesige, 2020)

Distance learning, digital learning environments, and, where appropriate, autonomous study have all been used to provide instruction and assistance for students in a developed country like Finland. (Huang et al., 2020). The higher education commission Pakistan has started a campaign to push higher education institutions toward the readiness of online education. Meanwhile, learning technologies such as print materials, using online tools, like zoom, LMS, TEAM, radio, television, and video look to allow learning chances in developing nations such as Pakistan, overcoming geographical access issues and the rigidities of traditional education. (Coreen et al., 2020)

Pakistan is no exception to the recent disaster, with school closures affecting millions of children and teachers. The world health organization gave instructions to keep physical and social distance during the pandemic in march 2020. Parents and other education stakeholders applauded the government's order to close the institute due to the virus spreading among students. Although Pakistani school closures were proven to be effective in reducing the number of affected pupils. (Adnan & Anwar, 2020) various countries such as Pakistan, have never witnessed such widespread learning interruption, as a result, the haphazard Implementation of online teaching & learning has presented its own set of obstacles, particularly among instructors, who must spearhead the initiative.

Teachers' readiness to adopt online during this crucial period should not be

undervalued as the teachers are the main workers to play critical roles in implementing successful change. with teachers' readiness, this change is not possible. As it is the most important resource in any institution faced numerical psychological, physical, and financial challenges during this pandemic. however, teachers have been forced to continue and promote a new learning mechanism with safety precautions. (Du & Chaaban, 2020)

Consequently, instructors also face challenges in accepting technological change in the shape of online teaching in maintaining a positive attitude toward online education, adequate computer efficacy, management support, and motivation. As a result, more excellent knowledge of teachers' preparation as essential stakeholders in the existing situations, is critical to ensuring that the end is sustained for a long time. As per wiener, (2009) when the individual is not ready for change, the organization will have to face many challenges to implement successful change. Armenakis (2007) cited in his research article when employees became resistant if they are not agreed to adopt the change positively.

Although few studies have focused on teachers' readiness for technological change in education, Only a few studies (Scherer et al, 2020; Tseng et al, 2021; Tondeur et al, 2019) have looked into instructors' readiness for virtual education during the worst situation during transition time setting or dealing with technology. To carry out a teacher's readiness level it is very essential to focus on the ability to run the technology, intrinsic and extrinsic motivation, and their thinking about the institutional support. these all factors affect the readiness to adopt the latest technology or software. Thus, there is a pressing need to explore teachers' readiness to face unprecedented crises to meet the challenges of the 21st century. According to this background, this study aims to measure faculty preparedness based on UTAUT factors (Mansor, et al, 2020)

Faculty Preparedness for Implementing Change

Because of research, leadership, and policy, change is unavoidable in the educational

system. It's fast-paced, exponential, and complicated, but it's also vital to keep the current management in place. (Kotter, 1990). The institution must be sure about the teacher's readiness before the change is implemented, as change needs attention for rapid progress. (Datnow, 2020).

readiness is a comprehensive factor to determine employee beliefs, attitude, their confidence level, to accept and reject a particular situation. (Armenakis & Harris, 1993). numerous studies found that, if the employee is ready for a change to accomplish organizational goals, they can be well confident to manage the change for effective implementation (Mansor, 2021). As a result, change can be sustained for a long time. (Zabarani, & Jamaludin, 2021).

Fundamental Theories of the UTAUT model

Venkatesh and Davis proposed the model based on nine theories of psychology and sociology (2012) multiple factors are presented in this theory. this model is very comprehensive. many researchers used this model for multiple measures in different fields of information and communication technology, education, and for different companies' acceptance modelling. (Kong, 2020). Venkatesh claimed that this model is very reliable and valid for multiple studies, particularly in the field of technology, as it explained the 70% technology readiness behaviour. Kong, (2020). A unified theory of acceptance and usage of technology consists of four key concepts, "Performance Expectancy, effort expectancy, social pressure, facilitating conditions, and Hedonic motivation" that have a direct influence on readiness to adopt it, these factors are extracted from the previous nine models e.g.,

"Technology Acceptance Model" "Innovation Diffusion Theory" "Theory of Reasoned Action" "Motivation Model" "Theory of Planned Behavior" "Combined TAM and TPB" "Model of PC Utilization" (MPCU), and "Social Cognitive Theory" (SCT). These factors are clearly defined as follows:

1. Performance expectancy: The extent to which a person believes that employing

the system will assist him or her in improving job performance.

2. Effort expectancy: The extent to which a person thinks that the system is friendly and easy for the user.
3. Social influence: The extent to which a person thinks that other people create pressure to use the new system.
4. Facilitating conditions: the extent to which an individual believes that organizational support to use the new system.
5. Hedonic motivation, the extent to which individuals feel excited when using technology.

Role of Gender in Technological change

Yasodha focused on the factor of gender for technological change. user attitude varies in different situations toward the adoption of technology. (2012) Numerous other studies reveal that males are most likely ready for the adoption of technology as compared to females. for instance, one study is concluded in brazil found that males are strong users of M.banking.(Pushel et al. 2010) one other study has found a valuable difference in gender comparison. males are more confident o using new technology as compared to females. (Joshua 2011). Few other studies in the education sector concluded that the findings of the study were the major difference between males and females. (Shurkran & Mardatillah, 2020)

Research Method

The researcher selected the quantitative method to collect data from University teachers. The sample was drawn from Punjab and federal universities consisting of 220 teachers. A survey study design is used in this study. Because "numerical description of a population, trends, attitudes, or opinions can be acquired by researching a sample of that group" (Creswell, 2002). faculty teachers from Rawalpindi Islamabad were selected for the data collection process.

Sample

A total of 220 samples were taken from a population of 1200 faculties at higher

education institutions in Rawalpindi and Islamabad. The researcher follows the instruction given by Krejci and Morgan (2012) to select the sample size. This sample is the best representative of the population. (n=220, N = 1200) according to the questionnaire contributors are requested to provide feedback on the bases of their current state of mind. (Clark & Creswell, 2017).

Instrument Reliability and Validity

Based on the quantitative study survey questionnaire was adapted and developed by Venkatesh and Davis (2000) procedure of the questionnaire was divided into parts. The first part of the questionnaire was based on

demographic information. The second information was based on the faculty's readiness to adopt online teaching based on UTAUT.

Five factors were measured readiness Performance expectancy, (attitude) effort expectancy, (ease of use) social influence, (subjective norms), facilitating conditions, (institutional facilities), and hedonic motivation (intrinsic motivation). This survey tool was based on a five-point Likert scale, strongly disagree to strongly agree. Participants are requested to reflect on their current situation of COVID-19. Cronbach's alpha was used to analyze the reliability.

Table 1

| Variables | No of Items | Cronbach's alpha (α) |
|---------------------------|-------------|-------------------------------|
| Readiness to adopt change | 44 | .915 |

Before the data, collection the researcher validated the questionnaire from three experts. For this process validation, the researcher negotiated with five field experts to validate the questionnaire. The experts were related to the field of educational management. The researcher consulted individually.

Descriptive statistics (mean, standard deviation) were used for the data analysis. The independent-T-test was applied for male and female comparison.

Data Analysis

The first step of the data analysis was to test the reliability of the questionnaire. After resolving the data screening issue. Cronbach's alpha was applied to verify the data. In the second step of the analysis, descriptive analysis was carried out to measure the readiness of (total and sub-constructs).

Results

This study aimed to measure readiness based on gender. To meet this need instrument reliability is very important whether is acceptable or applicable. Readiness was measured based on the five-factor developed by Venkatesh & Davis (2011) in the study. In the 1st table level of readiness was measured by the mean score along with the standard deviation. Table three illustrated the gender-based comparison. The age-based analysis is shown in the table.

Table 2. The Mean Score of the Level of Teacher Readiness for Implementing Online

| Factors | Mean score | SD | Level |
|-------------------------|------------|----------|--------|
| Performance Expectancy | 3.41 | 0.819142 | High |
| Effort Expectancy | 3.68 | 0.963245 | High |
| Social influence | 3.05 | 0.956147 | Medium |
| Facilitating conditions | 2.50 | 1.334618 | Low |
| Hedonic Motivation | 2.45 | 1.501583 | Low |
| Total | 3.02 | 0.704797 | Medium |

The interpretation of the level of readiness was based on Hamza & Juraimi suggestion (2018) The total mean score was M = 3.02.

This mean score indicates that the overall teacher readiness towards online teaching was medium. Although the mean score of

level of readiness in the context of performance expectancy was (M=3.41).it shows the level of readiness in the context of performance expectancy was high among participants. The mean score of effort expectancy was (M=3.68). this value shows the level of effort expectancy was also high. The

mean score of social influence is (M=3.05) shows that the level of social influence was medium. The mean score of the facilitating condition was (M=2.64) low as shown in the table. the mean score of hedonic motivation was (M=2.61) it indicates that level of motivation was low.

Table 3. Measuring readiness to adopt change based on Gender. (male and female comparison)

| Factors | Gender | N | Mean | t value | df | Sig |
|-------------------|--------|-----|--------|---------|-----|------|
| Teacher readiness | Male | 123 | 3.1510 | -836 | 218 | .378 |
| | Female | 97 | 3.2311 | | | |

In the given table of gender comparison, a non-significant result was found as the value shows, Male (N= 193) and female (N= 97). Males' average values of readiness were 3.1510 and females' values of readiness were 3.23. under the column of the t table value which is -836. The male and female groups for

respondent readiness had $p > .05$, which represents the smaller effect size (Coladarci, Cobb, Minium, & Clarke, 2010). The value of the t-test shows that there is no significant difference in gender regarding the respondent's readiness.

Table 4. Comparison of Five Factors Scores of Male and Female Respondents

| Factors | Gender | N | Mean | t | P | Df | Mean Difference | 95% CI | |
|---------|--------|-----|------|-------|------|-----|-----------------|--------|-------|
| | | | | | | | | Lower | Upper |
| PE | Male | 123 | 3.21 | 312 | .341 | 218 | .035 | .184 | .257 |
| | Female | 97 | 3.28 | | | | | | |
| EE | Male | 123 | 3.66 | 2.041 | .003 | 218 | -.220 | -0.16 | .528 |
| | Female | 97 | 3.38 | | | | | | |
| SI | Male | 123 | 3.09 | .654 | .514 | 218 | .085 | -171 | .341 |
| | Female | 97 | 3.01 | | | | | | |
| FC | Male | 123 | 2.73 | 0.409 | .273 | 218 | -.165 | -.522 | .192 |
| | Female | 97 | 2.56 | | | | | | |
| HM | Male | 123 | 2.57 | -.492 | .255 | 218 | -.100 | -.503 | .302 |
| | Female | 97 | 2.67 | | | | | | |

Note: $df = 320$; $d = \text{Cohen's } d$; CI = Confidence Interval and $* = p < 0.05$

In the given table of gender comparison, males (N= 123) and females (N= 97). The values are stating that the study found no difference between the two groups regarding performance expectancy, social influence, facilitating condition, and hedonic motivation. Only effort expectancy has a high mean difference in gender comparison.

Discussion

The core objective of this study was to measure the faculty readiness to accept technological change during a pandemic. Teacher readiness was measured via the UTAUT model developed by Venkatesh

(2012) Thus, an instrument adapted according to the study This instrument is valid and reliable for future studies involving teacher readiness to adopt technological change during covid.

For implementing online teaching. The five elements of teacher readiness to adopt online teaching and implement online instruction are performance expectancy, Effort expectancy, Social Influence, Facilitating Conditions, and Hedonic Motivation. which are based on nine behavioural theories. The reliability of the questionnaire was 0.84. value of reliability shows the effective tool to measure. the current study found the level of readiness was

medium as shown in the table. performance expectancy and effort expectancy found the high readiness among the teachers. which the level of facilitating condition and hedonic motivation was low. while the perception of social influence was medium. The mean score of performance expectancy results shows that teachers had strong beliefs about the usefulness of online teaching. These findings contrast with those (Simon & Rafferty, 2006) who found a weak readiness level among employees and high resistance. another study found the attitude was high as compared to the other three dimensions. (Fullan, M, 2021). This contradicts Hassan et al. (Hassan, Rabani, 2018), who found that the attitude toward the change was at a moderate level. (Kondakci, Y.; Beycioglu, Hassan, Rabani, 2018).

The result of the hedonic motivation and facilitating condition shows that there is a low mean score of FC and HM according to the beliefs of teachers. According to the results, organizational facilities are not properly countered and the level of readiness in the context of hedonic motivation was also at a low level. they are not feeling happiness in using technology. the result of social influence was moderate as most of the respondents are affected by their surroundings. However, Yuen and Ma found that the level of readiness was high in four dimensions. (2020)

(Azlin, et al, 2020). According to the study of Azlin, 2020, an insignificant result was found in gender comparison.

This model is a very strong model to predict Teacher Readiness for online teaching. This tool is reliable to measure teachers' attitudes, Abilities, beliefs, subjective norms, and motivation. However, the scale can use according to the needs of the researcher. but the valid and reliable tool is a big factor in the effect on the authentic study.

Study Restrictions

This study aims to measure the faculty readiness for technological change, a comparative analysis based on gender. the sample of the study represents the in-service faculty perception of five factors. the sample

is taken from the universities of well-developed cities in Pakistan. Rural areas' results can be changed according to the situation. This study may be applied to other countries in a comparative context.

Future Recommendation

In the context of reaching high-quality online education, a few recommendations are suggested in this study based on the findings.

The research found a medium level of readiness among faculty teachers based on five factors.

In the context of performance expectancy and effort, expectancy teachers showed high enthusiastic beliefs to teach online. On the other hand, faculty teachers have a low level of readiness in the context of facilitating conditions and hedonic motivations.

Furthermore, this study has found no difference between males and females in four factors but there was little difference in effort expectancy between females and males.

Based on the research conclusion, the study recommended that the administration and policymakers help monitor the status of online teaching implementation and plan strategic interventions to achieve anticipated outcomes in the higher education system of Pakistan.

The institute may increase the quality of training sessions to teach online which include, skills pieces of training, knowledge enhancing training, classroom management training, course evaluation training, preparing online teaching and learning materials, and monitoring students training.

Further based on the 2nd findings of the study teachers may support financially and emotionally, which include providing laptops, quality internet, motivational training, a peaceful technological environment, and technical assistance.

The study recommended that future researchers may conduct the research in rural areas in Pakistan. In addition, the sample size may be extended in further research all over the country.

In addition, this search recommended using other factors to analyze the level of faculty readiness.

Conclusions

This study concluded that the validity and reliability of the tool were confirmed to measure faculty readiness. Five factors of UTAUT were utilized in this study for faculty readiness. based on the Venkatesh model researcher adapted the research tool according to the nature of the study. The tool consisted of 44 items of five factors. it is deemed an applicable tool to measure the level of readiness for online teaching. This study found that the level of readiness was medium. Which need to be more training sessions to enhance the level of readiness. according to Kurt Lewin, this is unfreezing

stage when people are ready to accept the technological transition in COVID. The study concludes that the level of online teaching to accept technological change(online teaching) was medium. Overall Males and females have no significant difference between them. however, males have stronger attitudes toward effort expectancy. The level of readiness in the context of Facilitating conditions and hedonic motivation was low. The study recommended that institutional support plays a crucial role in implementing change, so it must be increased. hedonic motivation may be increased through different training sessions and practices. based on the finding of the study, the strategic decision-makers and administrative position holders can get help to monitor the current situation of readiness to achieve the successful implementation change.

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