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IDENTIFYING GENERATIONAL DIFFERENCES IN EDTECH ADOPTION AMONG PAKISTANI UNIVERSITY FACULTY: RESISTANCE, ACCEPTANCE, AND TRAINING NEEDS

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ABSTRACT
This mixed-method research discusses the generational factors that affect the adoption of educational technology among Pakistani universities faculty members in Lahore and Islamabad. The survey was conducted using stratified random sampling of 400 faculty members each of Baby Boomer, Generation X, and millennial cohort and 30-40 interviews were conducted to gain qualitative information. The study explored the adoption, resistance determinants, acceptance determinants, and intergenerational training requirements. Findings showed that there were statistically significant generational disparities in the rates of EdTech adoption, with the highest number of Millennials (67% daily) using it, followed by Generation X (38%) and Baby Boomers (12%). Constructs of the Technology Acceptance Model had big differences, especially on the ease of use and self-efficacy. The regression analysis also found generation as the most predictive factor with 48.7% variances explaining it with technological self-efficacy, availability of training, institutional support, and peer influence. The qualitative data showed that noncompliance among the older faculty was based on pedagogical ideologies and lack of confidence and not lack of technology. Infrastructure and lack of training were considered to be the major challenges in all generations. The COVID-19 pandemic increased the rate of adoption between cohorts but revealed substantial levels of support gaps. Results highlight the necessity of generation sensitive professional development initiatives, better institutional infrastructure, peer learning, and holistic support systems to bridge the digital divide in Pakistan higher education.

Keywords: Generational factors, adoption, educational technology, Baby Boomer, Generation X, millennial cohort.

INTROSUCTION

The blistering growth of education technology has completely redefined the environment of higher learning in most countries' world over, and the development posed both benefits and threats to academic institutions and faculty personnel (Akram et al., 2021). The implementation of educational technology has become a more pressing issue in the higher education sector in Pakistan, which comprises millions of students who live in different geographical and socioeconomic environments, as a factor in ensuring the quality and competitiveness of their

academic services in the digital era (Ahmad et al., 2025). Over the last ten years Pakistani universities have invested heavily in technological infrastructures, learning management and digital resources but the efficient use of these technologies has not been consistent across institutions and even within the individual faculty members (Saqlain & Shahid, 2024a). Implementation of educational technology succeeds not only because of the resources available but also, to a large extent, on the acceptance, competencies, and the willingness of the faculty to incorporate the use of these tools in their classroom programs (Kumar et al., 2024).

The concept of generational differences is a very important and but under-researched aspect of technology adoption pattern among faculty members in the university (Liang et al., 2023). The members of the faculty belonging to various generations possess different experience, attitudes and level of comfort with technology, which depend on technological context of their formative years and professional growth (Hussain et al., 2017). Having joined the academic field at a time when teaching was conducted through chalk and talk, Baby Boomers can be rather hesitant about educational technology and view it as an addition, not as a part of teaching (Raza et al., 2024). The faculty of generation X, who have lived through a period of change between analog and digital workplace, are likely to be found in the middle ground, choosing which technologies to embrace and which to abandon according to their perception of how it will help them reinforce their old activities. Being used to being surrounded by various digital technologies, millennials tend to exhibit a higher level of comfort and interest in the application of EdTech and perceive technology as a natural part of the modern educational process (Selwyn, 2021).

Pakistani higher education environment has some special features which affect the technology adoption trends. The unique aspects of culture, institutional hierarchy, resource constraints, and different degrees of technological infrastructure of public and private universities make the implementation of EdTech a complex process in the environment (Ahmad et al., 2023). The COVID-19 pandemic amplified the need of digital teaching and revealed massive inequalities in faculty preparedness and revealed imminent training requirements across the generational groups. The issues with technological skills and institutional support systems were demonstrated when many faculty members had to switch to online and blended learning models with little preparation. This sudden change highlighted that the significance of the knowledge of generational differences in the process of technology adoption cannot be overstated to create practical, focused interventions (Devkota, 2021).

Although today educational technology is increasingly appreciated as a part of the higher education strategy in Pakistan, there is scarce empirical evidence on analyzing how these generations differ in terms of adoption patterns by the faculty (Abbasi et al., 2015). The majority of the available literature has concentrated on the student-based views or the overall technology integration without targeting the role of generational variables in the context of faculty resistance, acceptance, and training needs. This is an important research gap considering faculty members are major actors of the educational delivery system and their technological skills directly influence student learning processes and outcomes (Asad et al., 2021). The knowledge of the particular barriers, motivations, and support requirements of various generational groups is necessary in formulating evidence-based policies and professional development initiatives that will contribute to the spread of EdTech use among the diverse faculty members in Pakistan (Ahmad et al., 2023).

This research paper has attempted to close this important gap by carrying out systematic research to examine the generational disparities in the adoption of educational technology among faculty members at two large universities in Lahore and Islamabad, two large educational cities that are

home to numerous government and higher educational institutions with different technological capabilities and assets. Through the data on resistance factors, acceptance drivers, and training needs in the cohorts of Baby Boomer, Generation X, and Millennial faculty, the research offers detailed information on the complicated nature of factors that affect EdTech integration in Pakistani higher education. The results can provide the practical implications on the university administrators, policymakers, and professional development experts who want to maximize the use of technologies and improve the quality of teaching based on generation-sensitive interventions and support provisions.

RESEARCH OBJECTIVES

1. To study the variation in the level of adoption and adoption trends of educational technology by the Baby Boomer, Generation X and the Millennial faculty members in Pakistani universities.
2. To determine what particular factors, support resistance and adoption of educational technology in the generations of faculty at the university.
3. To identify the training and professional development needs of members of various generations of the faculty to improve the effective integration of EdTech.

RESEARCH QUESTIONS

1. What are the meaningful variations in the rate of educational technology adoption and use patterns between Baby Boomer, Generation x and Millennial faculty in Pakistani universities?
2. Which particular determinants play roles in resistance and acceptance of educational technology in the various generational groups of faculty in universities?
3. What are the training needs and professional development requirements of various-generation faculty members to be able to integrate educational technologies into the educational process?

SIGNIFICANCE OF THE STUDY

The research is of much importance to Pakistani higher education since it offers empirical data on the generational differences in EdTech adoption, which can be used by universities to design generation-sensitive professional development programs that assist in meeting the specific needs and barriers of different generations of faculty cohorts. The results provide practical implications to institutional policymakers and administrators on how to devise effective strategies of integrating technology into their institutions that would consider the generational differences in terms of technological comfort, pedagogical preferences and learning styles. Recognizing the particular resistance factors and training needs by generational groups will allow allocating the resources more effectively and creating tailored support systems that can accelerate the adoption of EdTech and improve the delivery of teaching, as a result of this research. In addition, the research work is a contribution to the sparse body of actual studies about the acceptance of technology in the Pakistani higher education settings and serves as the basis to future research and comparative research. The generated insights will be helpful in closing the digital divide between the faculty, which will eventually benefit the student learning experience and enhance the quality of higher education and global competitiveness of higher education in Pakistan in the ever-growing technological-based learning environment.

LITERATURE REVIEW

Educational technology has become a revolutionary concept in tertiary education across the world, which has drastically changed how teaching is done, learning process, and how institutions run

their affairs (Andleeb et al., 2025). The combination of digital content, learning management systems, multimedia resources, and interactive platforms has brought new opportunities of personal learning, collective knowledge creation, and adaptable learning delivery (Fatima & Ahmad, 2025). Studies have consistently shown that technological infrastructure, in itself, cannot ensure successful implementation, but faculty approval, capabilities and readiness to incorporate technology in pedagogy are key factors to successful EdTech implementation. Multiple research works have found that faculty attitudes, beliefs and technological self-efficacy are the major influential factors in technology integration (Dexter, 2023).

The Technology Acceptance Model, which was developed by Davis and is used extensively in education, offers a conceptual basis of the way people accept the use of new technologies (Akram et al., 2021; Ramadani, 2024). According to the Technology Acceptance Model, the perceived usefulness and perceived ease of use are assumed to be major predictors of the technology acceptance and behavioral actions to use it. Faculty members in the educational institutions assess the technologies by whether they think the technologies will improve their teaching and student achievement and whether they have enough confidence and capabilities to use it without undue strain and anxiety. This model has been proven in research studies in various cultural and institutional settings and has shown to be relevant when used to explain patterns of faculty adoption of technology (Unal & Uzun, 2021). Researchers have also indicated that the institutional support, technical infrastructure, availability of training and collegial influence are also additional variables that can moderate the relationships that were initially put forward in the original model (Islam et al., 2023).

The generational theory presents some useful information on how to explain the differences in the patterns of technology adoption of the faculty members (RAMADANI & SALLAUKA, 2024). Cohorts by definition are groups of people possessing similar historical experiences and shaping technological realities, and tend to have their own orientational frames toward technology that endure into their working lives (Fristedt et al., 2021). Being an older generation, Baby Boomers came into academia in a society where teaching was traditionally more of a conservative profession and are therefore likely to be more skeptical of educational technology, and may find it as potentially undermining the quality of interpersonal teacher student relations which are so treasured by them. According to research, Baby Boomer faculty often complains of technology taking over human interaction, they also doubt the pedagogical importance of digital resources, and they also display less technological self-efficacy than younger workers. Such attitudes are not caused by any form of technological incompetence but are based on strong pedagogical philosophies that have been formed in the early years of professional experience (Abdou, 2023).

Faculty members in the generation X generation hold a middle ground in the technological world since they experienced and embraced the change between the analogue and digital world at some point in their careers. Research defines this group as naturalistic technology adopters who willingly inculcate technology selectively as they see that it is adding to their already recognized teaching patterns rather than technology adoption (McHaney, 2023). The faculty of Gen X is generally moderately technologically comfortable and eager to learn new systems with appropriate training and support given. Nevertheless, they tend to strike a balance between the use of technology and stick to the traditional practices, and, therefore, develop hybrid pedagogies based on the use of digital and traditional teaching strategies. Empirical studies indicate that the flexibility, as well as autonomy in choosing and adopting technologies that fit their individual professional and teaching situations, is highly appreciated by Generation X faculty (Chan & Lee, 2023).

The most comfortable in terms of educational technology and the most eager to incorporate digital technologies into their classroom activities are the millennial faculty members who have spent their entire lives in the setting of digital technologies and social media (Ramadani & Shishko, 2024). It is constantly shown in studies that Millennial faculty view technology not as an optional or added value to modern education but as part and parcel of it. This Generation tends to exhibit better technological competence, more experimental (with respect to new technology) and better institutional technological infrastructure expectations than other colleagues of a given age. Nonetheless, studies also show that Millennials might not be exposed to conventional pedagogical practices and can at times fail to strike the right balance between the incorporation of technology and the basic teaching principles and, in some instances, can be just too dependent on technological solutions without sufficient pedagogical rationale (Marrero Galván et al., 2023).

Studies on faculty technology adoption in the developing countries and Pakistan is no exception and show that there is more complexity beyond generational issues (Rasool et al., 2022). Research carried out in Pakistani universities has noted that there are major barriers such as poor technological infrastructure, lack of technical support, poor internet access, regular power outages and lack of professional development (Gul et al., 2023). Organizational factors interplay with the generational differences to generate different adoption trends that are not similar to the ones witnessed in developed nations that have strong technological infrastructures (Saqlain & Shahid, 2024b). Cultural variables such as hierarchical institutional frameworks, opposition to the use of pedagogical innovation, and lack of incentives to integrate technologies adds to the problems of Pakistani faculty who want to use educational technologies. Literature reinforces the idea that to ensure successful implementation of EdTech in Pakistani settings, it is necessary to focus on the individual-level factors, i.e., skills, attitudes, and the systemic ones, i.e., infrastructure, support systems, and institutional policies (Mughis, 2023).

Literature on training needs of the faculty has shown that general-purpose methods of professional development are not very effective in facilitating adoption of sustainable technology (Ramadani, 2022a). Research indicates that a successful training course should be designed to take into account the learning style of the generational workers, should offer a practical learning experience, should offer continuous learning after the workshop, and should indicate how technology skills are related to particular disciplinary and pedagogical practices (Ramadani, 2022b). It has been shown that the Baby Boomers also enjoy patient, step-by-step training with extensive practice time and encouragement whereas Millennials choose high-paced, self-directed studies with immediate application opportunities. The Generation X members of the faculty generally enjoy the flexible types of training that do not demand much of their time and ones that are sensitive to their competencies. Moreover, research highlights that effective professional development involves not only paying attention to technical proficiencies, but also pedagogical integration techniques, to make faculty realize how technology can complement, not substitute, effective teaching methods (Chipps et al., 2023).

RESEARCH METHODOLOGY

Research Design

The researchers adopted mixed-method research design where both quantitative and qualitative data gathering methods were used to thoroughly investigate the difference in generational use of educational technology by Pakistani university faculty staff. Such a design gave an opportunity to analyze the patterns of adoption statistically, as well as to dive deeper into the underlying attitudes and barriers.

Population and Sampling

The target population included members of the faculty in the public and the private universities of Lahore and Islamabad, the two largest learning centers in Pakistan. It employed the stratified random sampling method to participants to represent three generational groups, including Baby Boomers (1946-1964), Generation X (1965-1980), and Millennials (1981-1996). It consisted of about 400 complete faculty members of various scholastic backgrounds in the chosen universities in both cities.

Data Collection Instruments.

Quantitative Phase

Formative questionnaire was created based on reliable scale to assess EdTech acceptance (Technology Acceptance Model), frequency of using technology, and perceived barriers. The questionnaire was also administered online using Google Forms as well as in paper format to meet the different levels of digital illiteracy among the respondents.

Qualitative Phase

With the help of purposive sampling, 30- 40 faculty members were taken on board in semi-structured interviews to be able to get in-depth details on resistance factors, acceptance drivers, and training specifications. Individual interviews were complemented by focus group discussions with the departmental heads.

Data Analysis

The SPSS software was used for quantitative data, making use of descriptive statistics, ANOVA, to compare the generational groups, and regression analysis, to find out the predictors of EdTech adoption. Thematic analysis of qualitative data was performed in order to find repetition and themes concerning resistance and training needs.

Ethical Considerations

The respective university ethics committees had to be consulted beforehand. All participants were informed and their consent was taken, with their confidentiality and participation being voluntary. To safeguard the identities of the participants in the research process, anonymization of data was done.

RESULTS AND DATA ANALYSIS

QUANTITATIVE ANALYSIS

Table 1: Demographic Distribution of Respondents

Generation	Frequency	Percentage	Mean Age	Gender (M/F)
Baby Boomers	98	24.5%	56.3	68/30
Generation X	156	39.0%	44.7	89/67
Millennials	146	36.5%	33.2	78/68
Total	**400**	**100%**	**43.1**	**235/165**

The demographic profile showed that there was a fairly balanced distribution between the generational groups, whereby Generation X constituted the majority at 39 percent, Millennials recorded the highest number of 36.5 percent, and Baby Boomers took the lowest at 24.5 percent. The average age of all the subjects was 43.1 years, and the averages of the Baby Boomers were 56.3 years, Generation X was 44.7 years, and Millennials was 33.2 years. Gender distribution presented more male faculty (58.75) than females' faculty (41.25) representing the larger gender correlation in Pakistani university faculties. This distribution had sufficient representation in all the generations to affect a useful comparative analysis.

Table 2: EdTech Adoption Rates Across Generations

Technology Tool	Baby Boomers	Generation X	Millennials	Overall Mean
Learning Management Systems	42%	68%	89%	66.3%
Video Conferencing	38%	71%	92%	67.0%
Interactive Presentations	51%	74%	88%	71.0%
Online Assessment Tools	34%	62%	85%	60.3%
Digital Collaboration Platforms	29%	58%	81%	56.0%

The overall adoption rates showed some drastic differences in terms of generation in all education technology categories. Millennials were the ones that had the highest adoption rates of the various tools with 81-92 being the adoption rates, whereas Baby Boomers had the least adoption rates with 29-51. Generation X was placed in the middle between 58 and 74 percent adoption rate. Interactive presentation tools became the most popular technology used by all generations with a total of 71% whereas digital collaboration platforms had the lowest overall adoption at 56%. These results are a clear indication that the membership of generational cohorts has a great impact on the patterns of EdTech adoption.

Table 3: Technology Acceptance Model Constructs by Generation

Construct	Baby Boomers (Mean)	Generation X (Mean)	Millennials (Mean)	F-value	p-value
Perceived Usefulness	3.21	3.89	4.45	87.34	<0.001
Perceived Ease of Use	2.87	3.76	4.38	112.56	<0.001
Behavioral Intention	3.05	3.82	4.52	95.47	<0.001
Actual Usage	2.93	3.68	4.41	103.28	<0.001

Scale: 1=Strongly Disagree to 5=Strongly Agree

Technology Acceptance Model constructs analysis indicated statistically significant differences in all the generational groups. Millennials were always at the top of all the four constructs with a mean of between 4.38 and 4.52, which means that they agreed with technology acceptance measures. Baby Boomers recorded the lowest means scores of between 2.87 and 3.21 indicating moderate to neutral attitude. Generation X recorded mediocre scores with means ranging between 3.68 and 3.89. The results of ANOVA proved these differences to be statistically significant ($p<0.001$) in all constructs with an F-value in the range of 87.34 to 112.56. The highest generational gap was in perceived easiness of use, which implies that technological confidence is an important distinguishing variable.

Table 4: Barriers to EdTech Adoption by Generation

Barrier	Baby Boomers	Generation X	Millennials	Chi-Square	p-value
Lack of Training	87%	71%	45%	58.32	<0.001
Insufficient Infrastructure	79%	68%	62%	9.87	0.007

Time Constraints	76%	81%	69%	6.43	0.040
Low Self-Efficacy	82%	54%	28%	89.76	<0.001
Lack of Technical Support	73%	66%	58%	7.21	0.027

Perceptions of barriers analysis showed specific generation trends of the barriers to EdTech adoption. Training deficiency was the most critical obstacle among the Baby Boomers with a figure of 87 and then 71 and 45 among the Generation X and Millennials respectively. The greatest generational difference was in technological self-efficacy where 82% of Baby Boomers reported this barrier as opposed to 28% of Millennials. The time constraints were felt by all the generations almost equally, 69-81, with the highest concerns raised by Generation X. Chi-square tests showed that the differences between generational differences were statistically significant in all barriers, but the highest levels of association were found between training needs and self-efficacy concerns.

Table 5: Frequency of Technology Usage in Teaching

Usage Frequency	Baby Boomers	Generation X	Millennials	Total
Daily	12%	38%	67%	39.0%
Weekly	28%	41%	26%	31.7%
Monthly	34%	16%	5%	18.3%
Rarely/Never	26%	5%	2%	11.0%

The frequency of use of technologies in teaching showed that there are remarkable differences between the generations. Millennials were most engaged with 67 percent using educational technology on a daily basis and only 2 percent rarely or never using it. Baby Boomers reported reverse trends as only 12% of them used technology on a daily basis and 26% hardly ever or never. Generation X were in the middle ground with 38% of the daily usage and comparatively equal distribution among the usage frequencies. In total 39 per cent of the total faculty made daily technology use and 11 per cent hardly or never used technology in the classroom. The trends highlight the significant role that generational membership plays in real practices of technology implementation.

Table 6: Regression Analysis - Predictors of EdTech Adoption

Predictor Variable	Beta	Standard Error	t-value	p-value	R^2
Generation	0.412	0.057	7.23	<0.001	0.487
Technological Self-Efficacy	0.358	0.048	7.46	<0.001	
Training Availability	0.267	0.062	4.31	<0.001	
Institutional Support	0.189	0.071	2.66	0.008	
Peer Influence	0.143	0.069	2.07	0.039	

The multiple regression model resulted in the creation of 5 important predictors which account 48.7 percent of variance in adoption of EdTech. Membership of the generational cohort was the strongest predictor with the beta coefficient of 0.412 that confirms the fact that generation is a powerful predictor of adoption irrespective of the rest of the factors. The second strongest effect on technological self-efficacy 0.358 displays the ultimate significance of confidence and competence. Adoption was also positively associated with the availability of the training, institutional support and peer influence in a significant manner. At p=.05, all predictors were statistically significant. The model R 2 is 0.487 that indicates that all five variables can explain nearly half of the technology adoption behavior.

QUALITATIVE ANALYSIS

Theme 1: Generational Identity and Technology Perceptions

The awareness of the faculty members of all the generational cohorts was high as to the impact of their generational membership on their attitudes and behaviors towards technology. The Baby Boomers often identified themselves as digital immigrants who were having a hard time assimilating themselves into the fast-evolving technological settings, and they were nostalgic about the old-fashioned teaching techniques that they viewed as more genuine and human centered. The participants of Generation X described themselves as bridges who found both traditional and technological methods of learning and appreciated the flexibility to adopt the tools that were suitable in particular pedagogical situations. Millennials who considered technology as part of modern teaching and not a supplement to it were referred to as digital natives, although some of them admitted that they could become over-dependent on digital solutions. These self-images had a significant impact on the readiness of the participants to participate in the professional development and technology integration programs.

Theme 2: Pedagogical Philosophy and Technology Integration

The respondents indicated that strong pedagogical beliefs tended to override technical factors during implementation of technological decisions. Baby Boomer faculty were concerned that technology would reduce the personal relationships and mentoring relationships that they believed were so important in effective teaching and saw face-to-face interaction as being invaluable. The responses given by Generation X members were pragmatic in that they used technology where it had proven to definitely improve the learning outcome and use traditional methods in other areas. Millennial faculty espoused that technology would facilitate more interactive, engaging, and student-centered learning experiences that would meet the expectations of the current learners. Nevertheless, they all agreed that technology must not dominate the pedagogical agenda in the form of technology itself but is an instrument to fulfill schools pedagogical agenda.

Theme 3: Institutional Support and Infrastructure Challenges

The lack of support and insufficiency of infrastructure in the institutions were perceived as significant inhibiting factors to EdTech adoption by faculty representing all the discussed generations. The participants cited untrustworthy internet connection, old hardware, no enough licenses of the software and regular power interruption as the constant barriers that derail the technology integration process. The Baby Boomers especially highlighted the annoyance at the unavailability and unfriendly technical support in case of troubles, thus resulting in the avoidance of technology. Generation X and Millennial faculty emphasized the discouraging aspects of time spent learning technologies that could not be depended upon by the institutional infrastructure. The common denominator among the participants was that they needed to be able to engage in systematic infrastructure enhancement and receptive technical support systems as a prerequisite to meaningful integration of technology, despite the difference in the levels of technological comfort of different generations.

Theme 4: Training Needs and Professional Development Preferences

There were also some generational differences which appeared to be intense on the approach towards preferred training methods and the format of professional development. Baby Boomer respondents desired slow, practical workshops where they could have plenty of practice time, patient-centered teaching, and continued follow-up, as they felt in need of confidence and

assurance. The latest generation of faculty members favored just-in-time training that was flexible and had to consider time limits, provided practical application, and considered the existing competencies as well as filling a particular knowledge gap. It turned out that the participants of the millennial generation preferred independent study materials, a chance to collaborate with peers, and intensive training on new technologies instead of the rudimentary skills development. Every generation stressed the need to have discipline-based training that illustrates the application of technologies in their specific subject areas and teaching scenarios and not a generic technology teaching.

Theme 5: Collegial Influence and Peer Learning

The impact of collegial relationships and peer learning came out surprisingly as a source of influence in all the generational groups. A Baby Boomer faculty member noted that they would heavily depend on more junior members of the faculty as sources of informal advice and troubleshooting, and they would tend to seek the advice of fellow members of the faculty rather than technical support. The participants of Generation X highlighted the importance of learning communities in which faculty members can exchange successful strategies of technology integration and experience free and open debates about difficulties. Frustration among millennial faculty was found when they believed experimental and innovative efforts were not supported by institutional cultures, and longed to work in a setting where such actions were accepted. Peer modeling and collegial support was found to be a strong incentive to the use of technology by all generations, usually more effective than administrative requirements or official training initiatives.

Theme 6: COVID-19 Pandemic Impact and Accelerated Adoption

The COVID-19 pandemic was a revolutionary event that increased the use of technologies in all population generations with different effects and difficulties. The Baby Boomers explained that the abrupt conversion to online teaching was that much stressful and overwhelming that they had to hastily acquire skills they were avoiding, but many noted that they eventually found advantages in a manner they had not expected. A feature of generation X faculty was their response to the pandemic in which they felt pushed past their comfort zones with technology, which increased their adoption timelines but also demonstrated that there was a large gap in the provision of support. Millennials mostly adjusted best though stressed the distinction between emergency remote learning and purposefully created technology-supplemented education. The momentum that was traced after the pandemic was seen as an opportunity by all generations to institutionalize advances in technology with proper supporting systems.

DISCUSSION

Results show that there are complicated associations and interplay of generational membership, institutional environments, and personal aspects in defining the patterns of EdTech adoption in Pakistani faculty members of a university. The quantitative findings affirm that the differences in the generational difference in all the measured constructs are statistically significant where Millennials showed higher adoption rates, positive attitudes, and technological self-efficacy as opposed to the levels of Baby Boomers and Generation X. Nevertheless, the qualitative data transcends these trends, showing that the resistance of more mature faculty is less related to technological incompetence than to philosophies of their pedagogies, confidence lapses, and the lack of support systems. The regression model shows that although generation is a good predictor, modifiable variables such as the availability of training, institutional support, and the self-efficacy of technology are all important contributors, arguing that the interventions to close the generational gap are possible. The progressive disease among all cohorts proves the idea that contextual

pressures are capable of changing adoption pathways very fast and with the need and proper support. These results are in line with other studies across the world, but reveal some issues peculiar to Pakistan, in terms of infrastructure and support that compound the generational disparities.

CONCLUSION

This paper offers significant evidence that the generational differences have a profound impact on educational technology adoption among the faculty of Pakistani University with different patterns of resistance, acceptance, and training requirements between Baby Boomer, Generation X, and Millennial generation. Although Millennials show the highest adoption rates and feel comfortable with technology, there is significant diversity among all the generational groups with institutional support, availability of training, and personal self-efficacy being the moderating factors. The results suggest that to tackle the problem of the integration of EdTech in Pakistan, generation-sensitive solutions should consider various pedagogical principles, learning orientations, and degree of confidence and at the same time promoting the institutional infrastructure and supportive frameworks. The digital divide requires both individual-level and systemic approaches to successfully bridge this divide by means of individual-level approaches to guaranteeing professional development and systemic approaches to ensure better resources, technical support and institutional policies that encourage and support the integration of technology into the faculty across the board.

RECOMMENDATIONS

The differentiated professional development programs should be developed in universities that correspond to the preference of the generational learning: patient and practical training of the Baby Boomers; flexible practical training of the Generation X; discipline-related advanced skills training of the Millennials. The institutions should ensure they give focus to infrastructure upgrades such as quality internet connection, upgraded hardware and sensitive technical support systems which should facilitate but not impede the integration of technology undertakings by the institutions. Collegiate influence could be used to promote across the generational divide by establishing faculty learning communities that encourage peer mentoring and sharing of knowledge. Universities ought to establish incentive systems that will reward the integration of technology in the institution and give faculty some safe time to build on technological competencies without affecting other duties of the faculty. Lastly, the policy makers must 1) enforce minimum technology standards and 2) make sure that there are ample resources and support systems in place so that the faculty can go up to these expectations so as to transform the technology environment in the higher education of Pakistan with overall, generation sensitive strategies.

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