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TECHNOLOGY INTEGRATION AMONG HIGHER EDUCATION INSTITUTIONS (HEIs)

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Abstract: This study employed a descriptive-comparative research design to determine the extent of technology integration among private Higher Education Institutions (HEIs) in Negros Occidental offering Business Administration programs. Data were collected from 117 faculty members and administrative staff across 18 higher education institutions using purposive sampling. All data were analyzed using frequency, percentage, mean, and Kruskal-Wallis H test. Findings revealed that most respondents held a master's degree and were regular employees with 1–5 years of service. Many respondents came from institutions with no accreditation, followed by those with Level I and II accreditation. Respondents rated technology integration in HEIs "great extent" in terms of tangibility, reliability, responsiveness, assurance, and empathy. The highest ratings were associated with respondents having doctoral degrees, longer years of service, and those from institutions with higher accreditation levels. It can be noted that those contractual or part-time employees and institutions without accreditation provided lower ratings. Significant differences were found in technology integration when grouped by length of service and program accreditation. These results suggest that institutional quality assurance mechanisms and professional development are closely linked with improved integration of technology among HEIs.

Keywords: Technology Integration, Higher Education Institutions (HEIs), Accreditation, Tangibility, Reliability, Responsiveness, Assurance, Empathy

I. INTRODUCTION

The higher education environment has experienced significant transition in recent years, with technology integration becoming a crucial factor in institutional success, operational efficiency, and academic achievement. The shift has been significantly expedited by global events and the rising digitization of educational services, rendering technology integration an imperative for higher education institutions (HEIs) globally (Sharif et al., 2025; Alenezi & Akour, 2023). Sharif et al. (2025) emphasize that higher education institutions have progressed from intermittent technology adoption to executing structured digital transformation initiatives that incorporate platforms, data architecture, and the restructuring of administrative processes to facilitate hybrid delivery models and achieve long-term institutional objectives. This strategic approach represents a significant transformation in how institutions understand and implement technology integration.

Educational institutions are progressively implementing integrated application and data architectures featuring interconnected systems such as Learning Management Systems (LMS), Student Information Systems (SIS), and Customer Relationship Management (CRM) platforms to provide seamless user experiences and facilitate data-driven decision-making (Aripradono et al., 2024; Alenezi & Akour, 2023).

Research on technology integration in higher education institutions has become a vital field of study because of its significant effects on teaching, learning, and the functioning of institutions. Despite widespread adoption, challenges remain in understanding how technology integration specifically influences private colleges and universities, particularly regarding its impact on reputation and operational efficiency. Gaps are identified in assessing the quality of online learning platforms and their direct effects on student engagement and institutional branding. There is also disagreement on how much digital technologies help students learn compared to possible problems like digital divides and teacher resistance (Mexhuani, 2024). Multiple studies report insufficient faculty development programs, resistance to pedagogical change, and the need for sustained professional learning initiatives (Sharif et al., 2025; Cabral, 2025).

This study was conducted to address existing gaps by assessing and analyzing the extent of technology integration in the private HEIs offering business administration programs in Negros Occidental, Philippines. Specifically, it sought to determine the profile of the respondents in terms of educational attainment, length of service, employment status, location, and program accreditation. It also aimed to identify the extent of technology integration among higher education institutions in terms of tangibility, reliability, responsiveness, assurance, and empathy, as assessed by the respondents when taken as a whole and when grouped according to profile variables. Furthermore, it sought to determine whether there are significant differences in the extent of technology integration among higher education institutions in terms of tangibility, reliability, responsiveness, assurance, and empathy when classified according to profile variables.

II. METHODS

The study utilized a descriptive-comparative research design. This design is appropriate for identifying the current status of variables and examining the degree of association between them without manipulating any conditions.

Figure 1. Schematic Diagram Showing the Relationship between the Independent and the Dependent Variables of the Study

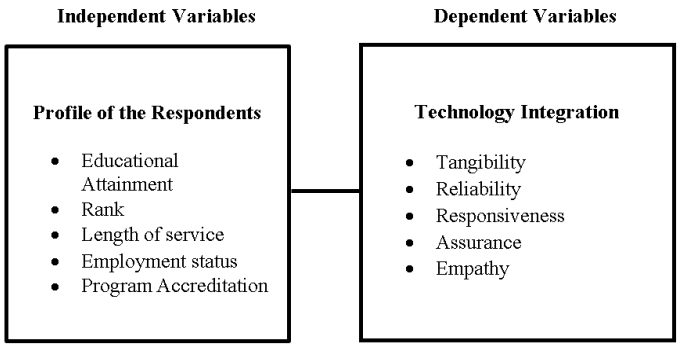

Figure 1 presents the schematic diagram showing the relationship between the independent and dependent variables of the study. The independent variables include the profile of the respondents, which consists of educational attainment, rank, length of service, employment status, and program accreditation. These variables represent the background characteristics that may influence the respondents' assessment. The dependent variable is the technology integration among higher education institutions, which is measured in terms of tangibility, reliability, responsiveness, assurance, and empathy. These dimensions are derived from the SERVQUAL framework and are used to determine the extent to which technology is integrated into institutional operations and service delivery.

Respondents. The study consisted of 117 respondents, including faculty members and administrative staff across the eighteen (18) private Higher Education Institutions (HEIs) in the province of Negros Occidental offering Business Administration program. The researcher utilized purposive sampling technique for a purposeful inclusion of faculty and staff who were directly in charge of the teaching-learning process.

Data Gathering Instrument. In this study, an adapted-modified questionnaire by Rolo, Alves, Saraiva, and Leandro (2023) was utilized to gather the necessary information among Higher Education Institutions (HEIs) in

Negros Occidental. Responses were measured using 5-Likert scale, which allowed for quantifiable analysis. The said questionnaire was divided into two (2) parts. Part I collected personal profile of the respondents. This section included items on educational attainment, academic rank, length of service, employment status, and the accreditation status of the program they were affiliated with. Part II consisted of a 20-item checklist on the extent of technology integration among Higher Education Institutions.

Data Gathering Procedures. After the validity and the reliability of the data gathering instrument were established, it was reproduced, ready for survey administration. The researcher employed three phases in conducting the study: The Pre-Investigation phase, the Investigation phase, and the Post Investigation phase.

In the Pre-investigation phase, the researcher utilized the adapted-modified instrument to gather data from the respondents. The questionnaire was then be submitted to the panel of experts to ascertain its validity. As soon as the pilot testing was conducted and achieved reliable result, the researcher then first obtained permission to conduct the study in the form of a letter from the Graduate School. The letter was then distributed to the private HEIs offering Business Administration programs in Negros Occidental to seek permission to conduct the study. When the letter was approved, survey proper commenced.

During the Investigation Phase, the researcher administered the final version of the questionnaire to the actual respondents across the participating Higher Education Institutions (HEIs). The researcher adopted a hybrid approach to data collection. For HEIs that preferred face-to-face interaction, the researcher personally delivered printed copies of the survey instruments, ensuring adherence to institutional health protocols such as mask-wearing, hand sanitation, and minimal contact. For institutions and respondents who opted for online participation, the questionnaire was disseminated via Google Forms, a secure and efficient platform that allowed respondents to complete the survey at their convenience. This dual-modality approach ensured flexibility, inclusivity, and safety, allowing the researcher to gather data without compromising the well-being of the actual respondents. To guarantee ethical conduct in the process of this research, the researcher definitely observed the following protocols: the respondent's name was never be mentioned in any part of the research, and there was an assurance that they should never emotionally and physically be harmed as a respondent of the research study. Proper and accurate document sourcing of the dates and materials was used in the study to avoid copyright infringement or plagiarism.

In the Post-Investigation Phase, all collected data from the completed questionnaires, both printed and digital, were carefully reviewed, organized, and encoded for statistical processing. For paper-based responses, the researcher manually encoded the data into a digital spreadsheet to ensure consistency and accuracy in data entry. Data from the online surveys (Google Forms) were directly exported into Microsoft Excel to facilitate consolidation and to perform in-depth statistical analysis.

III. RESULTS AND DISCUSSION

After a thorough evaluation of the data gathered from the respondents, the following results were obtained:

Table 1. Profile of the Respondents

Table 1. Profile of the Respondents

Profile	f	%
Educational Attainment		
Bachelor's Degree	47	40.2
Master's degree	59	50.4
Doctoral Degree	11	9.4
Rank		
Instructor	87	74.4
Assistant Professor	12	10.3
Associate Professor	11	9.4
Professor	7	6.0
Length of Service		
1-5 years	82	70.1
6-10 years	27	23.1
>10 years	8	6.8
Employment Status		
Part-time	36	30.8
Contractual	23	19.7
Regular	58	49.6
Program Accreditation		
None	49	41.9
Level I	32	27.4
Level II	18	15.4
Level III	10	8.5
Level IV	8	6.8
Total	**117**	**100%**

Table 1 shows that the majority of respondents had master's degrees (50.4%), were instructors (74.4%), and had worked for one to five years (70.1%). Many came from unaccredited programs (41.9%), and many were regular employees (49.6%). As to rank, 87 out of 117 respondents, or 74.4% of the total, were instructors, which is the entry-level academic rank in the majority of institutions. Assistant professors make up a smaller percentage (12, or 10.3%), followed by associate professors (11, or 9.4%). Finally, the highest academic rank, professor, is held by just 7 or 6.0% of people. Regarding length of service, the largest group of respondents (82 or 70.1%) have been in service for 1-5 years, whereas 27 respondents, or 23.1%, have served for 6-10 years. Only 8 or 6.8% have more than 10 years of service. For employment status, 49.6% of the respondents, or 58 people, are regular employees. Conversely, 23 or 19.7% are contractual, and 36 or 30.8% are part-time employees. Lastly, the program accreditation revealed that 49 or 41.9% of the respondents indicated that their programs do not have any accreditation, while 32 or 27.4% reported that their programs are at Level I accreditation. It is followed by 18 or 15.4% at Level II, 10 or 8.5% at Level III, and only 8 or 6.8% at Level IV accreditation.

The findings showed that many faculty members are in the early stages of their academic careers, both in terms of tenure and rank. The dominance of master's degree holders indicate compliance with CHED Memo No. 46 s. 2012, which requires graduate degrees for teaching in higher education. The prevalence of part-time and contractual employment reflects limited job security, which can reduce institutional commitment and innovation.

Table 2. Extent of Technology Integration Among HEIs as Assessed by the Respondents When Taken as a Whole

Table 2. Extent of Technology Integration Among HEI's As Assessed by the Respondents When Taken as a Whole

Items	Mean	Description
Tangibility		
1. The learning technologies used for teaching & learning are up-to-date, user-friendly, easy to navigate, functioning properly, and meet the teaching-learning needs.	4.15	Great Extent
2. The faculty room is equipped with modern and up-to-date technology for preparing lectures and presentations (e.g., desktop computers or laptops, projectors, whiteboard, high-speed Wi-Fi, multifunction printer/scanner/copier, video-conferencing equipment).	3.82	Great Extent
3. The classrooms and computer laboratories are well-equipped with the necessary technology (e.g., mounted projectors and wide screen or smart TV) for teaching & learning.	3.97	Great Extent
4. The library is equipped with modern digital resources and access (e.g., e-books and e-journals, extensive online databases, video-conferencing facilities) for the research, wider accessibility, and efficient collaboration of faculty, staff, and students.	4.00	Great Extent
Sub-mean	**3.99**	**Great Extent**
Reliability		
1. The technology systems used for teaching and learning (e.g., Learning Management System, online platforms) function reliably and consistently without disruptions.	3.99	Great Extent
2. The technical support team is readily available and helpful in resolving any technology issues I encounter.	4.02	Great Extent
3. Instructors can always access the internet connection in the faculty room for online resources and communication.	4.00	Great Extent
4. The technology used for teaching, learning, and administrative tasks (e.g., online registration, student portal) functions properly and reliably.	4.09	Great Extent
Sub-mean	**4.02**	**Great Extent**
Responsiveness		
1. The faculty room environment is adaptable to accommodate different teaching styles and technology needs (e.g., movable furniture, multiple display options, etc.).	3.89	Great Extent
2. The institution provides timely updates and training on new technologies integrated into the curriculum.	3.88	Great Extent
3. The faculty, staff, and students receive prompt assistance when encountering difficulties with technology during online courses or meetings and other activities.	3.98	Great Extent
4. The IT department or support staff is responsive to requests for updates or new technology in the faculty room (when applicable).	4.01	Great Extent
Sub-mean	**3.94**	**Great Extent**
Assurance		
1. the personnel are confident in their ability to use the technology available in the faculty room for preparing and delivering lectures and/or presentations.	3.99	Great Extent
2. adequate and up-to-date training, resources, and support to ensure that the personnel are capable and comfortable in using the technological tools are provided.	3.96	Great Extent
3. The technology integration process is well-planned and implemented effectively.	3.92	Great Extent
4. The technology integration in the faculty room allows the faculty to deliver their courses effectively without worrying about technical disruptions.	3.92	Great Extent
Sub-mean	**3.95**	**Great Extent**
Empathy		
1. The technical support team understands the challenges that may face when using technology for teaching and learning.	4.05	Great Extent
2. alternative learning options for instructors and students who encounter difficulties with technology are provided.	3.93	Great Extent
3. The technology integration process considers the diverse teaching-learning styles and needs of instructors and students.	3.97	Great Extent
4. The technology in the faculty room caters to diverse teaching styles and preferences of instructors (e.g., options for both traditional presentations and interactive learning activities).	3.99	Great Extent
Sub-mean	**3.99**	**Great Extent**
Overall Mean	**3.98**	**Great Extent**

Scale of Means: 1.00-1.80 "Very Low Extent"; 1.81-2.60 "Low Extent"; 2.61-3.40 "Moderate Extent"; 3.41-4.20 "Great Extent"; 4.21-5.00 "Very Great Extent"

Table 2 presents the extent of technology integration among higher education institutions (HEIs) as a whole. Results revealed an overall mean of 3.98, which was interpreted as "Great Extent." This indicates that technology is regularly used and plays a significant role in the teaching-learning environment. Instructors are generally comfortable and competent in using digital tools to support teaching and assessment. Among the five dimensions, reliability ranked the highest (M = 4.02), highlighting the efficiency and consistency of technological tools. Responsiveness had the lowest sub-mean (M = 3.94), indicating areas for improvement in IT support and training.

Tangibility recorded a sub-mean of 3.99, which is categorized as "Great Extent." It can be noted that among the indicators, the highest-rated statement was "The learning technologies used for teaching & learning are up-to-date, user-friendly, easy to navigate, functioning properly, and meet the teaching-learning needs" (M = 4.15). However, it can be noted that the lowest-rated indicator was "The faculty room is equipped with modern and up-to-date technology for preparing lectures and presentations" (M = 3.82), indicating a need for improvements in faculty room resources.

Reliability received a sub-mean of 4.02, also categorized as "Great Extent." It can be noted that the highest-rated indicator was "The technology used for teaching, learning, and administrative tasks (e.g., online registration, student portal) functions properly and reliably" (M = 4.09), indicating strong confidence in the institution's technology infrastructure. However, it can also be noted that the lowest-rated statement was "The technology systems used for teaching and learning (e.g., Learning Management System, online platforms) function reliably and consistently without disruptions" (M = 3.99), which is interpreted as "Great Extent," suggests room for further stability improvements.

The ***assurance*** dimension, which reflects confidence in the use and effectiveness of technology, recorded a sub-mean of 3.95, interpreted as "Great Extent." The highest-rated indicator was the statement – "The personnel are confident in their ability to use the technology available in the faculty room for preparing and delivering lectures and/or presentations" (M = 3.99), indicating a strong level of competency among faculty members. The lowest-rated statements were "The technology integration process is well-planned and implemented effectively" and "The technology integration in the faculty room allows the faculty to deliver their courses effectively without worrying about technical disruptions" (both M = 3.92), showing minor concerns about the planning and implementation of technology integration.

Empathy had a sub-mean of 3.99, classified as "Great Extent." The highest-rated statement was "The technical support team understands the challenges that may face when using technology for teaching and learning" (M = 4.05), indicating that faculty members feel supported by the institution's technical support team. However, it is notable that the lowest-rated item was "Alternative learning options for instructors and students who encounter difficulties with technology are provided" (M = 3.93), indicating that further efforts could be made to accommodate different learning needs.

The findings indicate that faculty members experience reliable, responsive, and empathetic tech environments. This illustrates how well policies are being implemented in accordance with the trends of digital transformation. The results also show that although the current efforts to integrate technology are well received, there is room for improvement especially in the areas of faculty room technology resources, new technology training, and offering alternate learning options to students who have trouble using technology. By addressing these issues, the organization's dedication to successful technology integration in the classroom may be further reinforced.

Dizon & Padilla-De Guzman (2021) affirmed that strategic tech integration promotes efficiency and engagement. This supports the digital transition objectives of CHED and DepEd, particularly in the context of the new normal.

Table 3. Extent of Technology Integration Among HEIs as Assessed by the Respondents in terms of Tangibility, Reliability, Responsiveness, Assurance, and Empathy When Grouped According to Educational Attainment

Table 3. Extent of Technology Integration Among HEI's As Assessed by the Respondents in terms of Tangibility, Reliability, Responsiveness, Assurance, and Empathy When Grouped According to Educational Attainment

Items	Bachelor's Degree		Master's Degree		Doctoral Degree	
	Mean	Desc	Mean	Desc	Mean	Desc
Tangibility						
1. The learning technologies used for teaching & learning are up-to-date, user-friendly, easy to navigate, functioning properly, and meet the teaching-learning needs.	4.06	GE	4.17	GE	4.45	VGE
2. The faculty room is equipped with modern and up-to-date technology for preparing lectures and presentations (e.g., desktop computers or laptops, projectors, whiteboard, high-speed Wi-Fi, multifunction printer/scanner/copier, video-conferencing equipment).	3.77	GE	3.83	GE	4.00	GE
3. The classrooms and computer laboratories are well-equipped with the necessary technology (e.g., mounted projectors and wide screen or smart TV) for teaching & learning.	3.94	GE	3.95	GE	4.27	VGE
4. The library is equipped with modern digital resources and access (e.g., e-books and e-journals, extensive online databases, video-conferencing facilities) for the research, wider accessibility, and efficient collaboration of faculty, staff, and students.	3.81	GE	4.14	GE	4.09	GE
Sub-mean	**3.89**	**GE**	**4.02**	**GE**	**4.20**	**GE**
Reliability						
1. The technology systems used for teaching and learning (e.g., Learning Management System, online platforms) function reliably and consistently without disruptions.	3.89	GE	4.03	GE	4.18	GE
2. The technical support team is readily available and helpful in resolving any technology issues I encounter.	3.87	GE	4.08	GE	4.27	VGE
3. Instructors can always access the internet connection in the faculty room for online resources and communication.	3.89	GE	4.03	GE	4.27	VGE
4. The technology used for teaching, learning, and administrative tasks (e.g., online registration, student portal) functions properly and reliably.	4.00	GE	4.14	GE	4.18	GE
Sub-mean	**3.91**	**GE**	**4.07**	**GE**	**4.23**	**GE**
Responsiveness						
1. The faculty room environment is adaptable to accommodate different teaching styles and technology needs (e.g., movable furniture, multiple display options, etc.).	3.83	GE	3.88	GE	4.18	GE
2. The institution provides timely updates and training on new technologies integrated into the curriculum.	3.79	GE	3.86	GE	4.36	VGE
3. The faculty, staff, and students receive prompt assistance when encountering difficulties with technology during online courses or meetings and other activities.	3.85	GE	4.02	GE	4.36	VGE
4. The IT department or support staff is responsive to requests for updates or new technology in the faculty room (when applicable).	3.79	GE	4.10	GE	4.45	VGE
Sub-mean	**3.81**	**GE**	**3.97**	**GE**	**4.34**	**VGE**
Assurance	Mean	Desc	Mean	Desc	Mean	Desc
1. The personnel are confident in their ability to use the technology available in the faculty room for preparing and delivering lectures and/or presentations.	3.83	GE	4.08	GE	4.18	GE
2. Adequate and up-to-date training, resources, and support to ensure that the personnel are capable and comfortable in using the technological tools are provided.	3.87	GE	3.98	GE	4.18	GE
3. The technology integration process is well-planned and implemented effectively.	3.81	GE	3.98	GE	4.09	GE
4. The technology integration in the faculty room allows the faculty to deliver their courses effectively without worrying about technical disruptions.	3.81	GE	3.97	GE	4.18	GE
Sub-mean	**3.83**	**GE**	**4.00**	**GE**	**4.16**	**GE**
Empathy						
1. The technical support team understands the challenges that may face when using technology for teaching and learning.	3.94	GE	4.12	GE	4.18	GE
2. alternative learning options for instructors and students who encounter difficulties with technology are provided.	3.83	GE	3.98	GE	4.09	GE
3. The technology integration process considers the diverse teaching-learning styles and needs of instructors and students.	3.83	GE	4.05	GE	4.18	GE
4. The technology in the faculty room caters to diverse teaching styles and preferences of instructors (e.g., options for both traditional presentations and interactive learning activities).	3.87	GE	4.07	GE	4.09	GE
Sub-mean	**3.87**	**GE**	**4.06**	**GE**	**4.14**	**GE**
Total Mean	**3.86**	**GE**	**4.02**	**GE**	**4.21**	**VGE**

Scale of Means: 1.00-1.80 "Very Low Extent"; 1.81-2.60 "Low Extent"; 2.61-3.40 "Moderate Extent"; 3.41-4.20 "Great Extent"; 4.21-5.00 "Very Great Extent"

Table 3 shows that the doctoral group consistently rated higher, especially in Responsiveness (M = 4.34) and Reliability (M = 4.23). The lowest mean ratings came from those with bachelor's degrees, particularly in areas like Responsiveness (M = 3.81) and Assurance (M = 3.83), though still interpreted as "Great Extent." The total mean scores for each dimension indicate that faculty members with higher educational attainment see technology integration more favorably as it plays a significant role in the teaching-learning environment.

As to ***tangibility***, the result showed that Doctoral, Master's, and Bachelor's degree holders rated it "Great Extent" respectively (M = 4.20, 4.02, 3.89). The highest-rated indicator for Doctoral respondents was "The learning technologies used for teaching & learning are up-to-date, user-friendly, easy to navigate, functioning properly, and meet the teaching-learning needs" (M =4.45, "Very Great Extent"). The Bachelor's degree holders

gave the lowest rating to “The library is equipped with modern digital resources and access” (M = 3.81, “Great Extent”), indicating a potential area for improvement.

Reliability was rated “Very Great Extent” by Doctoral respondents (M = 4.23) and “Great Extent” by both Bachelor's (M = 3.91) and Master's (M = 4.07) degree holders. Doctoral respondents rated "The technical support team is readily available and helpful in resolving any technology issues" (M = 4.27, “Very Great Extent”) the highest, while Bachelor's degree holders gave a relatively lower score to "The technical support team is readily available and helpful" (M = 3.87, “Great Extent”), indicating a possible gap in the support system.

As to ***responsiveness***, the result shows a clear distinction between groups. Doctoral respondents rated this dimension “Very Great Extent” (M = 4.34), while Master's and Bachelor's degree holders rated it “Great Extent” (M = 3.97 and M = 3.81, respectively). The highest-rated indicator for Doctoral respondents was “The IT department or support staff is responsive to requests for updates or new technology” (M = 4.45, “Very Great Extent”), while the lowest-rated indicator for Bachelor's degree holders was “The institution provides timely updates and training on new technologies” (M = 3.79, “Great Extent”), suggesting a need for more frequent training sessions.

Assurance was rated consistently as “Great Extent” across all educational levels, with Doctoral degree holders assigning the highest rating (M = 4.16), followed by Master's (M = 4.00) and Bachelor's (M = 3.83) degree holders. The highest-rated statement for Doctoral respondents was "Personnel are confident in their ability to use the technology available in the faculty room" (M = 4.18, “Great Extent”), while Bachelor's degree holders gave the lowest rating to "The technology integration process is well-planned and implemented effectively"(M = 3.81, “Great Extent”), indicating potential concerns about planning and implementation.

Empathy was rated “Great Extent” across all educational levels, with Doctoral degree holders giving the highest rating (M = 4.14), followed by Master's (M = 4.06) and Bachelor's (M = 3.87). The highest-rated indicator for Doctoral respondents was the statement “The technical support team understands the challenges that may arise when using technology” (M = 4.18, “Great Extent”), while Bachelor's degree holders gave the lowest rating to “Alternative learning options for instructors and students who encounter difficulties with technology are provided” (M = 3.83, “Great Extent”), suggesting a need for more flexible learning solutions.

The findings indicate that faculty members with higher educational attainment may have more exposure to or familiarity with digital tools. This could help them get the most out of technology in their teaching and administrative work They might also be more appreciative of well-integrated systems because they have greater expectations and are better at judging things. It shows that faculty members who get higher degrees are better at using technology. On the other hand, people with lower academic qualifications may not be making full use of the technologies that are available to them. This could be because they haven't had enough training, experience, or confidence. This shows that there is a need for targeted capacity-building measures, especially for academics who don't have advanced degrees. It shows where things could be better, especially when it comes to training availability, technology resources in faculty rooms, and how quickly they respond to support inquiries, especially for people with Bachelor's degrees. Taking care of these things could make technology integration work better overall and make the technical environment more welcoming and responsive for all faculty members.

According to Dizon and Padilla-De Guzman (2021), effective technology use in education depends on the user’s competence and institutional support. Those with higher educational qualifications may be more attuned to both, resulting in higher satisfaction levels. The findings reflect the Systems Theory (von Bertalanffy, 1968), which emphasizes that the integration of complex components like infrastructure, people, and processes leads to optimal organizational performance. Faculty with higher degrees may be more integrated into institutional systems, thereby experiencing smoother technology use.

Table 4. Extent of Technology Integration Among HEIs as Assessed by the Respondents in terms of Tangibility, Reliability, Responsiveness, Assurance, and Empathy When Grouped According to Rank

Table 4. Extent of Technology Integration Among HEI's As Assessed by the Respondents in terms of Tangibility, Reliability, Responsiveness, Assurance, and Empathy When Grouped According to Rank

Items	Instructor		Asst. Prof.		Asso. Prof.		Professor	
	Mean	Desc	Mean	Desc	Mean	Desc	Mean	Desc
Tangibility								
1. The learning technologies used for teaching & learning are up-to-date, user-friendly, easy to navigate, functioning properly, and meet the teaching-learning needs.	4.05	GE	4.50	VGE	4.64	VGE	4.14	GE
2. The faculty room is equipped with modern and up-to-date technology for preparing lectures and presentations (e.g., desktop computers or laptops, projectors, whiteboard, high-speed Wi-Fi, multifunction printer/scanner/copier, video-conferencing equipment).	3.75	GE	4.42	VGE	3.91	GE	3.57	GE
3. The classrooms and computer laboratories are well-equipped with the necessary technology (e.g., mounted projectors and wide screen or smart TV) for teaching & learning.	3.89	GE	4.25	VGE	4.45	VGE	3.86	GE
4. The library is equipped with modern digital resources and access (e.g., e-books and e-journals, extensive online databases, video-conferencing facilities) for the research, wider accessibility, and efficient collaboration of faculty, staff, and students.	3.92	GE	4.50	VGE	4.27	VGE	3.71	GE
Sub-mean	**3.90**	**GE**	**4.42**	**VGE**	**4.32**	**VGE**	**3.82**	**GE**
Reliability								
1. The technology systems used for teaching and learning (e.g., Learning Management System, online platforms) function reliably and consistently without disruptions.	3.90	GE	4.42	VGE	4.27	VGE	4.00	GE
2. The technical support team is readily available and helpful in resolving any technology issues I encounter.	3.93	GE	4.33	VGE	4.36	VGE	4.00	GE
3. Instructors can always access the internet connection in the faculty room for online resources and communication.	3.92	GE	4.33	VGE	4.36	VGE	3.86	GE
4. The technology used for teaching, learning, and administrative tasks (e.g., online registration, student portal) functions properly and reliably.	4.01	GE	4.50	VGE	4.36	VGE	3.86	GE
Sub-mean	**3.94**	**GE**	**4.40**	**VGE**	**4.34**	**VGE**	**3.93**	**GE**
Responsiveness								
1. The faculty room environment is adaptable to accommodate different teaching styles and technology needs (e.g., movable furniture, multiple display options, etc.).	3.79	GE	4.25	VGE	4.27	VGE	3.86	GE
2. The institution provides timely updates and training on new technologies integrated into the curriculum.	3.78	GE	4.33	VGE	4.18	GE	3.86	GE
3. The faculty, staff, and students receive prompt assistance when encountering difficulties with technology during online courses or meetings and other activities.	3.90	GE	4.58	VGE	4.18	GE	3.71	GE
4. The IT department or support staff is responsive to requests for updates or new technology in the faculty room (when applicable).	3.92	GE	4.58	VGE	4.36	VGE	3.57	GE
Sub-mean	**3.85**	**GE**	**4.44**	**VGE**	**4.25**	**VGE**	**3.75**	**GE**
Assurance								
1. The personnel are confident in their ability to use the technology available in the faculty room for preparing and delivering lectures and/or presentations.	3.92	GE	4.33	VGE	4.18	GE	4.00	GE
2. Adequate and up-to-date training, resources, and support to ensure that the personnel are capable and comfortable in using the technological tools are provided.	3.90	GE	4.42	VGE	4.09	GE	3.71	GE
3. The technology integration process is well-planned and implemented effectively.	3.84	GE	4.42	VGE	4.09	GE	3.86	GE
4. The technology integration in the faculty room allows the faculty to deliver their courses effectively without worrying about technical disruptions.	3.84	GE	4.25	VGE	4.27	VGE	3.86	GE
Sub-mean	**3.87**	**GE**	**4.35**	**VGE**	**4.16**	**GE**	**3.86**	**GE**
Empathy								
1. The technical support team understands the challenges that may face when using technology for teaching and learning.	3.95	GE	4.50	VGE	4.27	VGE	4.14	GE
2. Alternative learning options for instructors and students who encounter difficulties with technology are provided.	3.85	GE	4.33	VGE	4.18	GE	3.86	GE
3. The technology integration process considers the diverse teaching-learning styles and needs of instructors and students.	3.91	GE	4.42	VGE	4.18	GE	3.71	GE
4. The technology in the faculty room caters to diverse teaching styles and preferences of instructors (e.g., options for both traditional presentations and interactive learning activities).	3.97	GE	4.33	VGE	3.91	GE	3.86	GE
Sub-mean	**3.92**	**GE**	**4.40**	**VGE**	**4.14**	**GE**	**3.89**	**GE**
Total Mean	**3.90**	**GE**	**4.40**	**VGE**	**4.24**	**VGE**	**3.85**	**GE**

Scale of Means: 1.00-1.80 "Very Low Extent"; 1.81-2.60 "Low Extent"; 2.61-3.40 "Moderate Extent"; 3.41-4.20 "Great Extent"; 4.21-5.00 "Very Great Extent"

Table 4 revealed that Assistant Professors reported the highest mean score (M = 4.40, "Very Great Extent"), followed by Associate Professors (M = 4.24), Instructors (M = 3.90), and Professors (M = 3.85), all interpreted as "Great Extent," except for the first two groups which reached "Very Great Extent." The results indicated that higher-ranking faculty members, especially Associate and Assistant Professors, felt that the technology available for teaching was more up-to-date and effective. Professors seemed to experience somewhat lower levels of satisfaction, especially with the technology available in their faculty rooms and the library.

Assistant professors (M=4.44) and associate professors (M=4.25) assessed ***responsiveness*** as "Very Great Extent", while instructors (M=3.85) and professors (M=3.75) found it "Great Extent". The most significant difference was noted in the prompt assistance provided to faculty members when encountering technical issues, where assistant professors reported the highest satisfaction (M=4.58). This finding highlights a potential gap in technology-related support experienced by lower-ranked faculty members.

The ***assurance*** dimension followed a similar trend, with assistant professors (M=4.35) and associate professors (M=4.16) rating it as "Very Great Extent" and "Great Extent" respectively. Instructors (M=3.87) and professors (M=3.86) also provided "Great Extent" ratings. Confidence in using technology was strongest among assistant professors (M=4.33), which could indicate that they receive more training or have greater exposure to technology integration.

Assistant professors (M=4.40) and associate professors (M=4.14) found ***empathy*** in technology integration "Very Great Extent" and "Great Extent," respectively. Meanwhile, instructors (M=3.92) and professors (M=3.89) perceived empathy as "Great Extent". The highest-rated statement was the understanding of technical support teams regarding faculty challenges (M=4.50) among assistant professors. However, instructors and professors rated the availability of alternative learning options lower, indicating room for improvement in inclusivity and support.

The results emphasized that mid-level academic ranks (Assistant and Associate Professors) experience better or more effective technology integration in their roles. They might be more actively involved in teaching innovations or receive greater institutional support for digital tools. On the other hand, Professors and Instructors may face unique challenges wherein professors might be more focused on research or administrative tasks and less engaged with day-to-day technology in the classroom. Instructors, often newer to the profession, may lack the experience or institutional support to fully benefit from available technology. All of these highlight a need for rank-specific technology support and training, ensuring that both junior and senior faculty receive appropriate tools and assistance to stay updated and effective in their teaching responsibilities.

These findings align with Systems Theory (von Bertalanffy, 1968) which suggests that the effectiveness of a system depends on how well all its parts (regardless of status) are supported and integrated. Mid-level faculty may function as active agents in the system, directly interacting with students and utilizing tech tools more regularly. Research by Caner and Aydin (2021) supports that faculty engagement and satisfaction with technology often depend on both institutional infrastructure and individual role expectations. More involved ranks, like Assistant Professors, are likely immersed in both teaching and institutional digital policies, which improves their perception and use of technology.

Table 5. Extent of Technology Integration Among HEIs as Assessed by the Respondents in terms of Tangibility, Reliability, Responsiveness, Assurance, and Empathy When Grouped According to Length of Service

Table 5. Extent of Technology Integration Among HEI's As Assessed by the Respondents in terms of Tangibility, Reliability, Responsiveness, Assurance, and Empathy When Grouped According to Length of Service

Items	1-5 yrs		6-10 yrs		>10 yrs	
	Mean	Desc	Mean	Desc	Mean	Desc
Tangibility						
1. The learning technologies used for teaching & learning are up-to-date, user-friendly, easy to navigate, functioning properly, and meet the teaching-learning needs.	4.06	GE	4.30	VGE	4.63	VGE
2. The faculty room is equipped with modern and up-to-date technology for preparing lectures and presentations (e.g., desktop computers or laptops, projectors, whiteboard, high-speed Wi-Fi, multifunction printer/scanner/copier, video-conferencing equipment).	3.70	GE	4.11	GE	4.13	GE
3. The classrooms and computer laboratories are well-equipped with the necessary technology (e.g., mounted projectors and wide screen or smart TV) for teaching & learning.	3.84	GE	4.22	VGE	4.50	VGE
4. The library is equipped with modern digital resources and access (e.g., e-books and e-journals, extensive online databases, video-conferencing facilities) for the research, wider accessibility, and efficient collaboration of faculty, staff, and students.	3.84	GE	4.37	VGE	4.38	VGE
Sub-mean	**3.86**	**GE**	**4.25**	**VGE**	**4.41**	**VGE**
Reliability						
1. The technology systems used for teaching and learning (e.g., Learning Management System, online platforms) function reliably and consistently without disruptions.	3.88	GE	4.15	GE	4.63	VGE
2. The technical support team is readily available and helpful in resolving any technology issues I encounter.	3.89	GE	4.19	GE	4.75	VGE
3. Instructors can always access the internet connection in the faculty room for online resources and communication.	3.87	GE	4.26	VGE	4.50	VGE
4. The technology used for teaching, learning, and administrative tasks (e.g., online registration, student portal) functions properly and reliably.	3.99	GE	4.19	GE	4.75	VGE
Sub-mean	**3.91**	**GE**	**4.19**	**GE**	**4.66**	**VGE**
Responsiveness						
1. The faculty room environment is adaptable to accommodate different teaching styles and technology needs (e.g., movable furniture, multiple display options, etc.).	3.82	GE	3.96	GE	4.38	VGE
2. The institution provides timely updates and training on new technologies integrated into the curriculum.	3.74	GE	4.15	GE	4.38	VGE
3. The faculty, staff, and students receive prompt assistance when encountering difficulties with technology during online courses or meetings and other activities.	3.88	GE	4.15	GE	4.50	VGE
4. The IT department or support staff is responsive to requests for updates or new technology in the faculty room (when applicable).	3.84	GE	4.37	VGE	4.50	VGE
Sub-mean	**3.82**	**GE**	**4.16**	**GE**	**4.44**	**VGE**
Assurance						
1. The personnel are confident in their ability to use the technology available in the faculty room for preparing and delivering lectures and/or presentations.	3.87	GE	4.26	VGE	4.38	VGE
2. Adequate and up-to-date training, resources, and support to ensure that the personnel are capable and comfortable in using the technological tools are provided.	3.88	GE	4.15	GE	4.13	GE
3. The technology integration process is well-planned and implemented effectively.	3.84	GE	4.07	GE	4.25	VGE
4. The technology integration in the faculty room allows the faculty to deliver their courses effectively without worrying about technical disruptions.	3.80	GE	4.15	GE	4.38	VGE
Sub-mean	**3.85**	**GE**	**4.16**	**GE**	**4.28**	**VGE**
Empathy						
1. The technical support team understands the challenges that may face when using technology for teaching and learning.	3.91	GE	4.30	VGE	4.63	VGE
2. Alternative learning options for instructors and students who encounter difficulties with technology are provided.	3.80	GE	4.22	VGE	4.25	VGE
3. The technology integration process considers the diverse teaching-learning styles and needs of instructors and students.	3.83	GE	4.30	VGE	4.38	VGE
4. The technology in the faculty room caters to diverse teaching styles and preferences of instructors (e.g., options for both traditional presentations and interactive learning activities).	3.88	GE	4.19	GE	4.50	VGE
Sub-mean	**3.86**	**GE**	**4.25**	**VGE**	**4.44**	**VGE**
Total Mean	**3.86**	**GE**	**4.21**	**VGE**	**4.44**	**VGE**

Scale of Means: 1.00-1.80 "Very Low Extent"; 1.81-2.60 "Low Extent"; 2.61-3.40 "Moderate Extent"; 3.41-4.20 "Great Extent"; 4.21-5.00 "Very Great Extent"

Data in Table 5 reveals a pattern of increasing satisfaction with technology integration as the length of service increases. Faculty members with 1-5 years of service rated overall technology integration as "Great Extent" (Mean = 3.86), while those with 6-10 years of service rated it as "Very Great Extent" (Mean = 4.20). Faculty members with more than 10 years of service provided the highest rating (Mean = 4.44, "Very Great Extent") reflecting more established support systems or greater familiarity with the support process.

As to ***tangibility***, the highest-rated item among those with more than 10 years of service is the availability of up-to-date and user-friendly learning technologies (Mean = 4.63, VH), signifying that experienced faculty recognize the technology to be more efficient and suitable for their teaching needs.

In the dimension of ***reliability***, the most notable improvement was observed in the availability of technical support, where respondents with more than 10 years of service provided the highest rating (Mean = 4.75, "Very Great Extent"). This highlights that longer tenure in service corresponds to higher satisfaction with the dependability of technology.

As to ***responsiveness***, the most significant improvement is seen in the prompt assistance received during technological difficulties (Mean = 4.50, "Very Great Extent") indicating that faculty members with longer service years feel more supported in terms of receiving technological assistance.

The highest-rated aspect of ***assurance*** among the respondents with more than 10 years of service is the capability of faculty members to deliver their courses effectively without worrying about technical disruptions (Mean = 4.38, "Very Great Extent") highlighting that those with longer service years have developed greater confidence in using technology for instructional purposes.

The most highly rated aspect of ***empathy*** is the technical support team's understanding of faculty challenges in using technology (M = 4.63, "Very Great Extent") indicating that institutions are progressively ensuring that faculty members receive adequate consideration and support for technology integration.

The findings emphasized that faculty members with longer tenure tend to be more proficient, confident, and consistent in using technology for instruction, assessment, and classroom management. Strengthening technical support and providing continuous training on emerging technologies can further improve the overall effectiveness of technology integration in higher education institutions.

These findings are supported by Systems Theory (von Bertalanffy, 1968), which emphasizes the importance of integration between all parts of an organization. Empirical support comes from Alemu (2023) and Dublar (2023), who found that faculty experience is a critical factor in how technology is adopted and appreciated in HEIs. Long-term service enables faculty to become more proficient in integrating digital tools into teaching and institutional tasks.

Table 6. Extent of Technology Integration Among HEIs as Assessed by the Respondents in terms of Tangibility, Reliability, Responsiveness, Assurance, and Empathy When Grouped According to Employment Status

Table 6. Extent of Technology Integration Among HEI's As Assessed by the Respondents in terms of Tangibility, Reliability, Responsiveness, Assurance, and Empathy When Grouped According to Employment Status

Items	Part-time		Contractual		Regular	
	Mean	Desc	Mean	Desc	Mean	Desc
Tangibility						
1. The learning technologies used for teaching & learning are up-to-date, user-friendly, easy to navigate, functioning properly, and meet the teaching-learning needs.	4.22	VGE	4.04	GE	4.16	GE
2. The faculty room is equipped with modern and up-to-date technology for preparing lectures and presentations (e.g., desktop computers or laptops, projectors, whiteboard, high-speed Wi-Fi, multifunction printer/scanner/copier, video-conferencing equipment).	3.83	GE	3.70	GE	3.86	GE
3. The classrooms and computer laboratories are well-equipped with the necessary technology (e.g., mounted projectors and wide screen or smart TV) for teaching & learning.	4.03	GE	3.74	GE	4.03	GE
4. The library is equipped with modern digital resources and access (e.g., e-books and e-journals, extensive online databases, video-conferencing facilities) for the research, wider accessibility, and efficient collaboration of faculty, staff, and students.	4.00	GE	3.65	GE	4.14	GE
Sub-mean	**4.02**	**GE**	**3.78**	**GE**	**4.05**	**GE**
Reliability						
1. The technology systems used for teaching and learning (e.g., Learning Management System, online platforms) function reliably and consistently without disruptions.	4.03	GE	3.70	GE	4.09	GE
2. The technical support team is readily available and helpful in resolving any technology issues I encounter.	4.17	GE	3.61	GE	4.09	GE
3. Instructors can always access the internet connection in the faculty room for online resources and communication.	4.14	GE	3.57	GE	4.09	GE
4. The technology used for teaching, learning, and administrative tasks (e.g., online registration, student portal) functions properly and reliably.	4.22	VGE	3.78	GE	4.12	GE
Sub-mean	**4.14**	**GE**	**3.66**	**GE**	**4.09**	**GE**
Responsiveness						
1. The faculty room environment is adaptable to accommodate different teaching styles and technology needs (e.g., movable furniture, multiple display options, etc.).	4.06	GE	3.65	GE	3.88	GE
2. The institution provides timely updates and training on new technologies integrated into the curriculum.	3.94	GE	3.48	GE	4.00	GE
3. The faculty, staff, and students receive prompt assistance when encountering difficulties with technology during online courses or meetings and other activities.	4.08	GE	3.61	GE	4.07	GE
4. The IT department or support staff is responsive to requests for updates or new technology in the faculty room (when applicable).	4.00	GE	3.57	GE	4.19	GE
Sub-mean	**4.02**	**GE**	**3.58**	**GE**	**4.03**	**GE**
Assurance						
1. The personnel are confident in their ability to use the technology available in the faculty room for preparing and delivering lectures and/or presentations.	4.06	GE	3.61	GE	4.10	GE
2. Adequate and up-to-date training, resources, and support to ensure that the personnel are capable and comfortable in using the technological tools are provided.	3.94	GE	3.74	GE	4.05	GE
3. The technology integration process is well-planned and implemented effectively.	3.94	GE	3.61	GE	4.03	GE
4. The technology integration in the faculty room allows the faculty to deliver their courses effectively without worrying about technical disruptions.	4.03	GE	3.57	GE	4.00	GE
Sub-mean	**3.99**	**GE**	**3.63**	**GE**	**4.05**	**GE**
Empathy						
1. The technical support team understands the challenges that may face when using technology for teaching and learning.	4.11	GE	3.65	GE	4.17	GE
2. Alternative learning options for instructors and students who encounter difficulties with technology are provided.	4.00	GE	3.57	GE	4.03	GE
3. The technology integration process considers the diverse teaching-learning styles and needs of instructors and students.	4.00	GE	3.65	GE	4.09	GE
4. The technology in the faculty room caters to diverse teaching styles and preferences of instructors (e.g., options for both traditional presentations and interactive learning activities).	4.00	GE	3.74	GE	4.09	GE
Sub-mean	**4.03**	**GE**	**3.65**	**GE**	**4.09**	**GE**
Total Mean	**4.04**	**GE**	**3.66**	**GE**	**4.06**	**GE**

Scale of Means: 1.00-1.80 "Very Low Extent"; 1.81-2.60 "Low Extent"; 2.61-3.40 "Moderate Extent"; 3.41-4.20 "Great Extent"; 4.21-5.00 "Very Great Extent"

Table 6 that the regular faculty gave the highest total mean score of (M = 4.06), followed closely by part-time faculty (M = 4.04), both rating technology integration "Great Extent." Contractual faculty, however, reported the lowest overall rating (M = 3.66), although still interpreted as "Great Extent." In terms of, contractual faculty consistently gave lower scores compared to the other groups, especially in ***responsiveness*** (M = 3.58, "Great Extent") and Assurance (M = 3.63, "Great Extent").

It can be noted that the lowest-rated item (M = 3.48, "Great Extent") was "The institution provides timely updates and training on new technologies integrated into the curriculum," from contractual faculty members. However, part-time faculty gave the highest mean score (M = 4.22, "Very Great Extent") to the statement: "The learning technologies used for teaching & learning are up-to-date, user-friendly, easy to navigate, functioning properly, and meet the teaching-learning needs."

The results indicated that the regular faculty felt more confident in using technology for their teaching, while contractual faculty appeared to lack confidence, possibly due to insufficient training or experience with available technologies. Regular faculty may receive more consistent support, training, and access to resources, leading to higher perceptions of technology integration. The lower ratings from contractual employees highlight a potential equity issue in institutional support and digital access, which could impact both performance and morale. Since contractual faculty often handle heavy teaching loads, this technological gap can directly affect instructional quality and student outcomes.

This pattern reflects Stakeholder Theory (Freeman, 1984), which emphasizes the responsibility of institutions to meet the needs of all stakeholders equitably. When certain employee groups are underserved, the system fails to support institutional objectives effectively. The findings are further supported by Ifenthaler & Yau (2020) and Dublar (2023), who observed that faculty perceptions of technology integration improve when institutions invest in inclusive digital infrastructure and regular capacity-building programs. From the Systems Theory perspective (von Bertalanffy, 1968), effective technology integration is not just about infrastructure—it depends on how each component (faculty) is supported within the system. A weakness in one part (contractual employees) creates imbalances and limits system performance. The CHED Quality Assurance Framework (2023) also reinforces that digital systems should be inclusive, efficient, and equitably accessible to all faculty to enhance institutional effectiveness.

Table 7. Extent of Technology Integration Among HEIs as Assessed by the Respondents in terms of Tangibility, Reliability, Responsiveness, Assurance, and Empathy When Grouped According to Program Accreditation

Table 7. Extent of Technology Integration Among HEI's As Assessed by the Respondents in terms of Tangibility, Reliability, Responsiveness, Assurance, and Empathy When Grouped According to Program Accreditation

Items	None		Level I		Level II		Level III		Level IV	
	Mean	Desc	Mean	Desc	Mean	Desc	Mean	Desc	Mean	Desc
Tangibility										
1. The learning technologies used for teaching & learning are up-to-date, user-friendly, easy to navigate, functioning properly, and meet the teaching-learning needs.	3.86	GE	4.25	VGE	4.39	VGE	4.30	VGE	4.88	VGE
2. The faculty room is equipped with modern and up-to-date technology for preparing lectures and presentations (e.g., desktop computers or laptops, projectors, whiteboard, high-speed Wi-Fi, multifunction printer/scanner/copier, video-conferencing equipment).	3.61	GE	3.97	GE	3.94	GE	3.90	GE	4.13	GE
3. The classrooms and computer laboratories are well-equipped with the necessary technology (e.g., mounted projectors and wide screen or smart TV) for teaching & learning.	3.67	GE	4.03	GE	4.28	VGE	4.20	GE	4.63	VGE
4. The library is equipped with modern digital resources and access (e.g., e-books and e-journals, extensive online databases, video-conferencing facilities) for the research, wider accessibility, and efficient collaboration of faculty, staff, and students.	3.67	GE	4.03	GE	4.50	VGE	4.20	GE	4.50	VGE
Sub-mean	**3.70**	**GE**	**4.07**	**GE**	**4.28**	**VGE**	**4.15**	**GE**	**4.53**	**VGE**
Reliability										
1. The technology systems used for teaching and learning (e.g., Learning Management System, online platforms) function reliably and consistently without disruptions.	3.65	GE	4.03	GE	4.39	VGE	4.30	VGE	4.63	VGE
2. The technical support team is readily available and helpful in resolving any technology issues I encounter.	3.71	GE	4.13	GE	4.44	VGE	4.20	GE	4.25	VGE
3. Instructors can always access the internet connection in the faculty room for online resources and communication.	3.78	GE	4.06	GE	4.28	VGE	4.00	GE	4.50	VGE
4. The technology used for teaching, learning, and administrative tasks (e.g., online registration, student portal) functions properly and reliably.	3.84	GE	4.09	GE	4.39	VGE	4.20	GE	4.75	VGE
Sub-mean	**3.74**	**GE**	**4.08**	**GE**	**4.38**	**VGE**	**4.18**	**GE**	**4.53**	**VGE**
Responsiveness										
1. The faculty room environment is adaptable to accommodate different teaching styles and technology needs (e.g., movable furniture, multiple display options, etc.).	3.59	GE	3.94	GE	4.11	GE	4.20	GE	4.63	VGE
2. The institution provides timely updates and training on new technologies integrated into the curriculum.	3.57	GE	3.88	GE	4.33	VGE	4.20	GE	4.38	VGE
3. The faculty, staff, and students receive prompt assistance when encountering difficulties with technology during online courses or meetings and other activities.	3.73	GE	4.03	GE	4.28	VGE	4.00	GE	4.63	VGE
4. The IT department or support staff is responsive to requests for updates or new technology in the faculty room (when applicable).	3.73	GE	4.00	GE	4.33	VGE	4.40	VGE	4.50	VGE
Sub-mean	**3.66**	**GE**	**3.96**	**GE**	**4.26**	**VGE**	**4.20**	**GE**	**4.53**	**VGE**
Assurance										
1. The personnel are confident in their ability to use the technology available in the faculty room for preparing and delivering lectures and/or presentations.	3.65	GE	4.06	GE	4.50	VGE	4.00	GE	4.63	VGE
2. Adequate and up-to-date training, resources, and support to ensure that the personnel are capable and comfortable in using the technological tools are provided.	3.73	GE	3.94	GE	4.33	VGE	4.20	GE	4.25	VGE
3. The technology integration process is well-planned and implemented effectively.	3.65	GE	4.00	GE	4.28	VGE	4.10	GE	4.25	VGE
4. The technology integration in the faculty room allows the faculty to deliver their courses effectively without worrying about technical disruptions.	3.67	GE	3.97	GE	4.28	VGE	4.00	GE	4.38	VGE
Sub-mean	**3.68**	**GE**	**3.99**	**GE**	**4.35**	**VGE**	**4.08**	**GE**	**4.38**	**VGE**
Empathy										
1. The technical support team understands the challenges that may face when using technology for teaching and learning.	3.82	GE	4.03	GE	4.50	VGE	4.10	GE	4.50	VGE
2. Alternative learning options for instructors and students who encounter difficulties with technology are provided.	3.65	GE	3.94	GE	4.39	VGE	4.10	GE	4.38	VGE
3. The technology integration process considers the diverse teaching-learning styles and needs of instructors and students.	3.73	GE	4.09	GE	4.28	VGE	3.90	GE	4.38	VGE
4. The technology in the faculty room caters to diverse teaching styles and preferences of instructors (e.g., options for both traditional presentations and interactive learning activities).	3.84	GE	4.00	GE	4.22	VGE	4.10	GE	4.25	VGE
Sub-mean	**3.76**	**GE**	**4.02**	**GE**	**4.35**	**VGE**	**4.05**	**GE**	**4.38**	**VGE**
Total Mean	**3.71**	**GE**	**4.02**	**GE**	**4.32**	**VGE**	**4.13**	**GE**	**4.47**	**VGE**

Table 7 presents the extent of technology integration from higher education institutions (HEIs) with varying levels of program accreditation. The overall mean in terms of revealed that level IV accredited programs reported the very great extent of technology integration (M = 4.47), while institutions with no accreditation reported the lowest total mean (M = 3.71) only, which is interpreted as "Great Extent."

Faculty members from Level IV accredited programs gave the highest total mean (M = 4.47), interpreted as "Very Great Extent." Notably, the highest-rated item was "The learning technologies used for teaching and learning are up-to-date, user-friendly, easy to navigate, functioning properly, and meet the teaching-learning needs" with a mean of M = 4.88, indicating near-universal satisfaction among respondents. Level II programs also reported very high levels (M = 4.32, "Very Great Extent"), especially in Tangibility (M = 4.28, "Very Great Extent") and Reliability (M = 4.38, "Very Great Extent"), reflecting well-supported digital teaching environments. Programs without accreditation showed the lowest total mean (M = 3.71), only "Great Extent," with lower sub-means across all categories. The lowest-rated items from these programs were: "The institution provides timely updates and training on new technologies integrated into the curriculum" (M = 3.57) and "The faculty room environment is adaptable to accommodate different teaching styles and technology needs" (M = 3.59). This indicates a lack of institutional support for both ongoing tech training and adaptive infrastructure in unaccredited programs.

Across all SERVQUAL dimensions, there is a positive trend: as accreditation level increases, so does the perception of effective technology integration. For example, ***Tangibility*** scored (M = 4.53, "Very Great Extent") for Level IV, while only (M = 3.70, "Great Extent") for unaccredited programs. These show that accreditation is strongly associated with better technology infrastructure, support, and responsiveness in HEIs.

The findings highlight that program accreditation is a clear indicator of institutional investment in technological resources and support systems. Higher accreditation is directly linked to stronger and more effective integration of educational technologies. Faculty from highly accredited programs benefit from better access to modern tools or more advanced tools for teaching and learning, responsive IT services or technical support, better IT infrastructure in classrooms and libraries, reliable platforms and internet access, consideration for diverse teaching and learning needs, and consistent training. Unaccredited programs may struggle with outdated technology, insufficient support, and lower morale among faculty. This creates not only performance gaps but also institutional inequities that can affect student learning and academic quality. These results highlight the value of continuous quality assurance and accreditation as drivers for digital transformation in education.

The findings support the CHED Quality Assurance Framework (2023), which explicitly links accreditation to improvements in instructional quality, governance, and support systems. Accreditation bodies often require proof of strong technological capabilities and services to maintain status. It also affirms Systems Theory (von Bertalanffy, 1968), which suggests that technology integration is successful only when all institutional components (policies, people, tools, and support) function together cohesively. Accredited programs likely have more established systems in place, leading to stronger performance in technology integration. From the perspective of Stakeholder Theory (Freeman, 1984), accreditation ensures that faculty, as internal stakeholders, receive adequate tools and environments to perform effectively. In parallel, research by Fonseca and Joana (2022) and Zakrzewski and Newton (2022) confirms that accredited institutions often demonstrate higher levels of innovation, responsiveness, and digital transformation, further reinforcing the importance of maintaining accreditation for institutional success.

Table 8. Differences in the Extent of Technology Integration Among HEIs as Assessed by the Respondents in terms of Tangibility, Reliability, Responsiveness, Assurance, and Empathy When Grouped According to Profile Variables

Table 8. Differences in the Extent of Technology Integration Among HEI's as Assessed by the Respondents in terms of Tangibility, Reliability, Responsiveness, Assurance, and Empathy when Grouped According to Profile Variables

Profile		p-value	Interpretation
Educational Attainment	Tangibility	0.208	Not significant
	Reliability	0.220	Not significant
	Responsiveness	0.198	Not significant
	Assurance	0.209	Not significant
	Empathy	0.188	Not significant
Rank	Tangibility	0.071	Not significant
	Reliability	0.067	Not significant
	Responsiveness	0.075	Not significant
	Assurance	0.069	Not significant
	Empathy	0.080	Not significant
Length of service	Tangibility	0.012	Significant
	Reliability	0.013	Significant
	Responsiveness	0.011	Significant
	Assurance	0.012	Significant
	Empathy	0.011	Significant
Employment Status	Tangibility	0.119	Not significant
	Reliability	0.126	Not significant
	Responsiveness	0.113	Not significant
	Assurance	0.120	Not significant
	Empathy	0.107	Not significant
Program Accreditation	Tangibility	0.001	Significant
	Reliability	0.000	Significant
	Responsiveness	0.001	Significant
	Assurance	0.001	Significant
	Empathy	0.012	Significant

$p<0.05$ level of significance

Data in Table 8 reveals the differences in the extent of technology integration among higher education institutions (HEIs) as assessed by the respondents when classified according to educational attainment, rank, length of service, employment status, and program accreditation. Results showed that there were no significant differences in the extent of technology integration in terms of respectively when grouped according to educational attainment, with the following values ($p = 0.208, 0.220, 0.198, 0.209$, and 0.188), rank ($p = 0.071, 0.067, 0.075, 0.069$, and 0.080), and employment status ($p = 0.119, 0.126, 0.113, 0.120$, and 0.107). Since all p-values exceed the 0.05 significance level, the null hypothesis stating that there are no significant differences in the extent of technology integration among higher education institutions in terms of ***tangibility, reliability, responsiveness, assurance,*** and ***empathy*** as assessed by the respondents was not rejected. These findings indicate that whether a respondent held a bachelor's or doctoral degree, or was an instructor or professor, perceptions of technology integration were statistically similar. Likewise, part-time, contractual, and regular faculty had fairly aligned views.

There were significant differences in the extent of technology integration in terms of respectively when grouped according to length of service ($p = 0.012, 0.013, 0.011, 0.012$, and 0.011) and program accreditation ($p = 0.001, 0.000, 0.001, 0.001$, and 0.001) respectively. This means that faculty who served longer were 29% to 41% more positive in their assessment of technology integration than their newer counterparts. As to program

accreditation, faculty from Level IV accredited programs reported the highest ranks. Conversely, those from programs with no accreditation gave the lowest ratings. The findings indicated that faculty from Level IV programs rated their institutions up to 47% higher than those from non-accredited ones in terms of technology integration.

As to length of service and program accreditation, the p-value was lower than the 0.05 significance level, therefore, the null hypothesis stating that there were no significant differences in the extent of technology integration among higher education institutions in terms of ***tangibility, reliability, responsiveness, assurance***, and ***empathy*** as assessed by the respondents was rejected.

The results indicate that both institutional maturity (as reflected in accreditation) and employee experience play roles in shaping perceptions of technology integration. These emphasize a need for professional development among junior faculty or those in less-accredited programs to increase familiarity and engagement with institutional technology. Also, schools with no or low accreditation levels may lack the resources or policies that encourage integrated tech use, which can affect teaching effectiveness and administrative efficiency.

These findings strongly support Rogers' (2003) Diffusion of Innovations Theory, which explains how innovation spreads through stages and social systems. Faculty with longer tenures likely passed through the stages of awareness, interest, evaluation, trial, and adoption more thoroughly than new hires. Moreover, programs with higher accreditation represent more innovative environments (early adopters) where technology is normalized and institutionalized. Consistent with the study of DICT (2023) and Dublar (2023), the integration of digital tools is more successful when educators perceive institutional support and training, particularly in environments with robust quality assurance systems.

IV. SUMMARY OF FINDINGS

Based on the detailed presentation, discussion, interpretation, and analysis of research findings, the following were the key findings of the study:

1. Demographic profiling of the respondents showed that most held a Master's degree, followed by Bachelor's and Doctoral degrees. A large portion had 1–5 years of service, with fewer having 6–10 years and more than 10 years. The majority were regular employees, while others were part-time or contractual. Many came from HEIs with no accreditation at all, followed by those with Level I and II accreditation.
2. As assessed by respondents, the extent of technology integration among HEIs was rated "Great Extent" in terms of tangibility, reliability, responsiveness, assurance, and empathy. The highest ratings came from those with doctoral degrees, more than 10 years of service, and those in institutions with Level III and IV accreditation. Lower ratings were observed from part-time employees and institutions without accreditation.
3. There were significant differences in the extent of technology integration among higher education institutions in terms of tangibility, reliability, responsiveness, assurance, and empathy when respondents were grouped by length of service and program accreditation. No significant differences were found in technology integration when respondents were grouped by educational attainment, rank, and employment status. All p-values were above 0.05.

V. CONCLUSIONS

In view of the foregoing findings, the following conclusions were drawn:

1. Respondents were predominantly Master's degree holder, instructor, had 1–5 years of service, regular status, and no accreditation. The respondents represented a diverse group of educators from different employment types, experience levels, and educational backgrounds. However, a notable number were employed in HEIs without formal program accreditation.
2. Technology was regularly used and played a significant role in the teaching-learning environment especially to all respondents with higher qualifications, longer tenure, and those affiliated with accredited institutions. Instructors were generally comfortable and competent in using digital tools to support teaching and assessment. Institutional maturity and stability which is reflected in program accreditation and faculty tenure may contribute to stronger technological adoption and integration in academic operations.
3. Length of service and program accreditation are significant factors in the extent of technology integration among higher education institutions in terms of tangibility, reliability, responsiveness, assurance, and empathy. Institutional development and faculty experience in shaping perceptions are of prime importance.

VI. RECOMMENDATIONS

Based on the foregoing findings and conclusions, the following recommendations were advanced:

1. The Commission on Higher Education (CHED) may strengthen program accreditation and monitoring by encouraging more HEIs to undergo formal quality assurance mechanisms. Given the study's finding that institutions with higher accreditation levels demonstrate better performance in technology integration, CHED may develop national guidelines and performance benchmarks that integrate technology-enhanced learning, aligning them with institutional missions and sustainable development goals (SDGs). Also, they may initiate capacity-building programs focusing on technology integration strategies, especially for HEIs with low to no accreditation, to ensure quality and inclusive educational systems.
2. The faculty members may leverage technology to enrich classroom practices by participating in training on emerging digital tools that support active and inclusive learning environments. They may suggest their respective HEI to consider expanding the use of digital platforms and formalized channels to gather and respond to student and faculty feedback.
3. The administrators may prioritize technology infrastructure investments and support the integration of systems that promote accessibility, security, and efficiency across all levels of operations.
4. The administrative staff members may undergo regular training on technology systems related to office productivity, digital records, and student services to align with the institution's overall tech integration.
5. College students may provide honest feedback through official surveys or forums and may take advantage of digital platforms provided by the school and advocate for more inclusive and student-centered technology solutions.
6. Higher Education Institutions (HEIs) may continue investing in up-to-date, user-friendly technologies for teaching and learning, as well as for administrative processes. This ensures that technology remains accessible and functional to all stakeholders. Furthermore, they may continue to provide regular training for faculty and staff to ensure they are equipped with the necessary skills to use modern technologies effectively in the classroom and in administrative tasks.
7. The current researcher may disseminate research findings to the academic community and to HEI leaders to inform decision-making and resource prioritization. She may serve as a catalyst for advocacy, especially in promoting technology integration among higher education institutions.
8. The future researchers may expand the study to include other stakeholders, such as alumni or external partners. Also, they may utilize qualitative methods such as interviews or focus groups to supplement quantitative findings and explore the reasons behind low or high ratings in specific items. Lastly, they may compare public and private institutions, or analyze region-based differences to determine contextual influences on technology integration.

CONFLICTS OF INTEREST

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