Studying the possibility of implementing ICT for enhancing the quality of teaching at the Higher Institute of Science and Technology Badr: Faculty members' perspective

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Abstract

This research investigates how Information and Communication Technology (ICT) is incorporated at the Higher Institute of Science and Technology Badr, with a specific focus on faculty opinions and encounters. The study included a survey of 20 faculty members, along with semi-structured interviews and focus group discussions, using a combination of quantitative and qualitative approaches. The results show a mostly favourable outlook on ICT, as 75% of participants acknowledge its advantages for education. Nevertheless, there are on-going notable obstacles, such as out-dated infrastructure (40%), inadequate training (47%), and reluctance to embrace change (20%). Although 53% of faculty feel ready to integrate ICT, only 20% claim to be highly prepared. The research emphasizes the need for thorough faculty training programs and technology assistance to improve digital skills and successful ICT incorporation. In addition, it is crucial to align ICT projects with organizational goals in order to overcome obstacles and create a supportive atmosphere for integrating technology. The findings from this study help in comprehending the challenges of integrating ICT in higher education, offering beneficial suggestions for improving teaching standards with the use of technology.

Keywords: Information and Communication Technology (ICT), Faculty member perspective, Quality of teaching.

1. Introduction

Within a progressively digitizing worldwide atmosphere, the application of Information and Communication Technology (ICT) is becoming a fundamental component in elevating instructional and educational outcomes within the realm of higher education establishments. [1] The amalgamation of digital technologies, collectively designated as Information and Communications

Technology, has exerted a considerable influence on the higher educational terrain internationally. Entities of higher learning, such as the Higher Institute of Science and Technology Badr, have acknowledged and harnessed the potential embedded in ICT to augment the quality of pedagogical and learning experiences[2]. Such incorporation of ICTs into higher education frameworks has been propelled by an escalating awareness pertaining to the transformative capabilities that technological advancements can confer upon the educational sector.

1.1- What is ICT?

Information and Communications Technology embodies the amalgamation of telecommunication systems, computing devices, auditory-visual apparatuses, and requisite software applications, including middleware and data storage solutions, which collectively facilitate user capabilities to access, retain, transmit, and manipulate informational content[3]. The prevalence of ICT application within the context of higher educational establishments has witnessed a global augmentation, as various institutions endeavour to harness technological advancements to ameliorate the educational quality pertaining to instructional methodologies and learning experiences. As a higher education body with a pronounced emphasis on scientific and technological disciplines, the Higher Institute of Science and Technology Badr remains steadfast in its dedication to investigating the possibilities afforded by ICT integration aimed at enhancing the educational calibre delivered to its learner population, all the while acknowledging the pivotal influence that technological resources exert in empowering both academic personnel and students alike[4].

1.2- The significance of ICT for the enhancement of quality of higher education

Primarily, the amalgamation of digital technologies possesses the potential to foster learning experiences that are considerably more interactive and engaging for students, consequently promoting active participation, collaborative efforts, and the development of critical thinking skills[5]. Moreover, the application of ICT serves to streamline the dissemination of educational content, provide accessibility to extensive online resources, and offer more customized feedback and support tailored to learners' needs. Furthermore, insights derived from data analytics within educational technology can significantly contribute to the formulation of evidence-based pedagogical

methodologies and the structuring of curricula. Through the careful and strategic implementation of ICT, institutions of higher education are positioned to enable both educators and learners to realize the comprehensive capacity of teaching and learning processes, thereby resulting in an enhancement of the overall educational quality[6][7].

1.3 - Research objectives and questions:

The primary aim of this inquiry is to examine the prospects for the incorporation of ICT and its consequential influence on the quality of instruction at the Higher Institute of Science and Technology Badr, specifically from the viewpoint of the faculty members. The principal research questions that this study addresses comprise:

a) What are the advantages of integrating ICT into teaching and learning at the Institute of Science and Technology Badr?

b) What problems do faculty members face when trying to use ICT in their teaching?

c) What strategies and recommendations can be provided to effectively use ICT to improve teaching quality at the Higher Institute of Science and Technology Badr?

2. Literature Review

Several prior studies have focused on the influences of technology integration on higher education learning quality. The findings of the research provide insight to encourage interaction with digital tools and platforms in education for engaged student learning. Re-imagining educational digital resources: this may ultimately increase student engagement(participation) and access to many (a wealth of) educational online learning opportunities that lead toward more personalized, supportive situated learning. Moreover, the incorporation of educational technology offers a means to interpret real-time data which can be used for understanding insights to follow an evidence-based teaching approach towards effective teaching and learning experience as well as helping faculty and students in harnessing it effectively[8][9].

Yet, the integration of ICTs in higher education is not as easily established. While much has been written about the potential of ICT to change teaching and learning from a teacher-led process into one which is more student-focused, there can be little doubt that these aspirations have not always crystallised in practice. Accordingly, the majority of higher education institutions have established units or directorates to oversee staff development and training programs towards creating a

sufficient number of faculty members competent enough to integrate technology into their teaching efficiently[10].

The benefits of ICT in higher and academic education are evident, products from Consortium projects have also proved this after their implementation but implementing new technologies in a practical way face will some challenges. Challenges to effective use in teaching include outdated infrastructure, low digital literacy among faculty and resistance to change. The lack of ICT integration, may not enable the use of the available technologies designing an optimized manner and educators are using it optimally inside their pedagogical approaches[11].

Responding to these challenges, researchers have put forward a number of strategies and models designed to support higher education institutions in exploiting ICT for the sake of increased teaching effectiveness. The provision of comprehensive faculty development programs, establishing dedicated support and technical assistance teams, as well as aligning with their institution's overall strategic goals and vision for ICT integration[12].

From the literature review, ICT appears to have great potential to improve teaching and learning quality in higher education. However, the basic ingredient of this technology is the integration which has an underlying reality that for successful implementation one cannot put a full stop on only technological or pedagogical intervention. Consequently, the current study seeks to further this work by examining faculty members 'perceptions at the Higher Institute of Science and Technology Badr - an institution concerned with science and technology higher education level- toward such implementation in their specific context.

3. Methodology

This research used both quantitative and qualitative research methods to be able to understand the faculty members' perception towards the efficiencies that will be possible if ICT is implemented at the Higher Institute of Science and Technology Badr and its ability to improve the quality of teaching..

3.1- Quantitative data collection:

The current research approach is first to conduct a quantitative survey of the faculty members to obtain quantitative data on their perception, attitude, and experience towards the use of ICT in teaching. Questions in Google forms will cover; the perceived benefits of ICT integration,

challenges and barriers to; ICT adoption, perceived readiness and willingness of the faculty members to integrate technology-enabled teaching practices[13].

3.2 - Qualitative data collection:

The quantitative survey will be followed by qualitative face-to-face interviews which are semi-structured with a sub-sample of the faculty members to obtain a richer and detailed understanding of their perception.

In particular, the interview questions will focus on the concrete experiences, ideas and suggestions of the interviewed faculty members that will provide an opportunity to describe the given patterns and trends in more detail, using the data obtained from the survey[14].

In addition to the individual interviews, the researchers will convene a focus group discussion to have a significant number of varied faculty members join the discussion to add some extra information regarding the key issues under consideration in the study.

Here are some examples of questions that were asked in questionnaire, interview and group discussion:

1- Questionnaire Tools using Google Form

1- How advantageous do you think integrating ICT into your teaching practices would be, on a scale of 1 to 5?

> 1: Not beneficial at all
> 2 :Slightly beneficial
> 3 :Moderately beneficial
> 4: Very beneficial
> 5: Extremely beneficial

2- What challenges do you face in adopting ICT in your teaching? (Select all that apply)

- Outdated infrastructure
- Lack of technical skills
- Resistance to change
- Insufficient training

3- how ready do you feel to incorporate ICT into your teaching techniques?

- Very prepared
- Somewhat prepared
- Not prepared

4- Would you be open to adjusting your teaching method to include a greater variety of ICT tools?

- Yes
- No
- Maybe

2- Interview Questions

1- Can you share a specific instance where you used ICT in your teaching? What was the outcome?

2- What kind of assistance do you believe is necessary for successfully incorporating ICT into your teaching?

3-Based on your experience, what are the primary obstacles that hinder the successful utilization of ICT in your classroom?

4- In what ways do you believe ICT integration can be in harmony with the objectives of the Higher Institute of Science and Technology Badr?

3- Focus Group Discussion

1- Brief overview of the purpose of the discussion and the importance of faculty input on ICT integration.

2- What common experiences do you have regarding the use of ICT in your teaching?

3- What are the most significant challenges you collectively face in integrating ICT?

4- What tactics do you believe the institute could adopt in order to enhance faculty support in utilizing ICT?

5- In your opinion, what is the future role of ICT in teaching at the institute?

3.3- Data analysis:

The quantitative survey data will be analysed by the use of statistical procedures for instance use of Excel, and Google Charts in a view to establishing trends, patterns, and relationships.

The interviews conducted with participants and focus group discussions will also be analysed qualitatively, whereby the researchers will read through the transcriptions of the discussion determine the emerging themes and come up with meaningful conclusions to supplement the quantitative analysis.
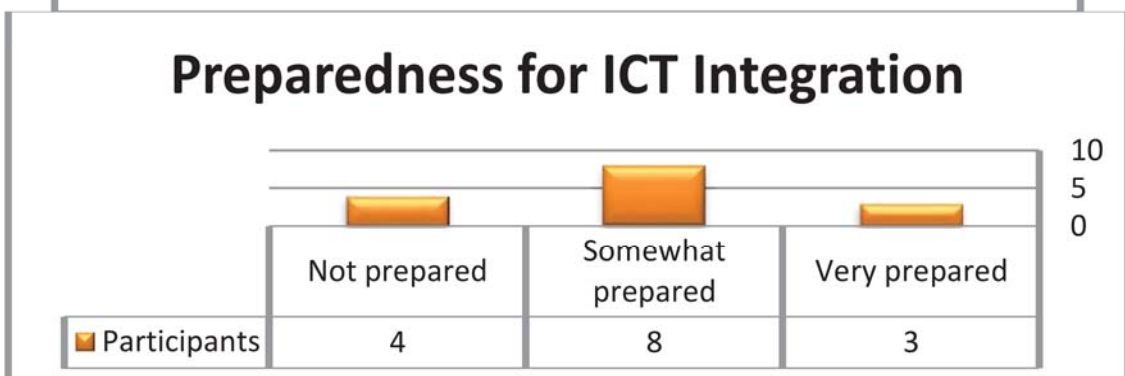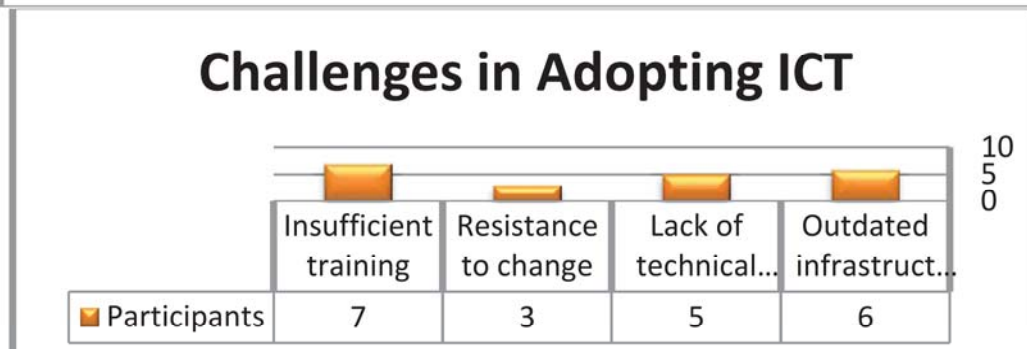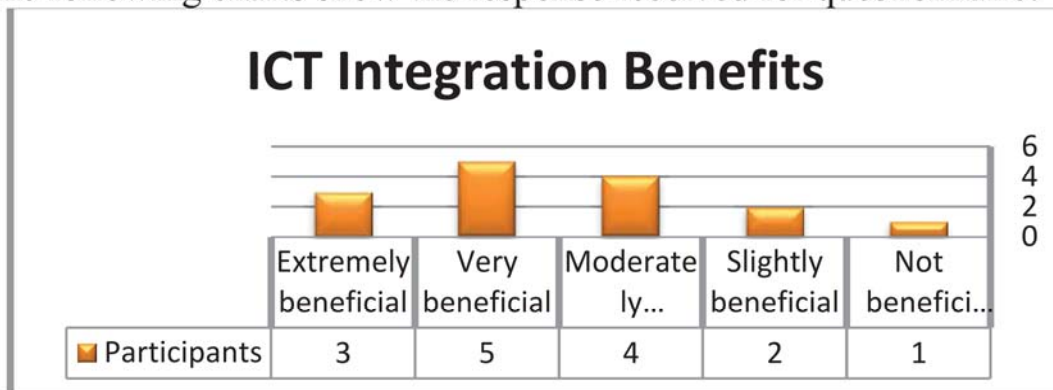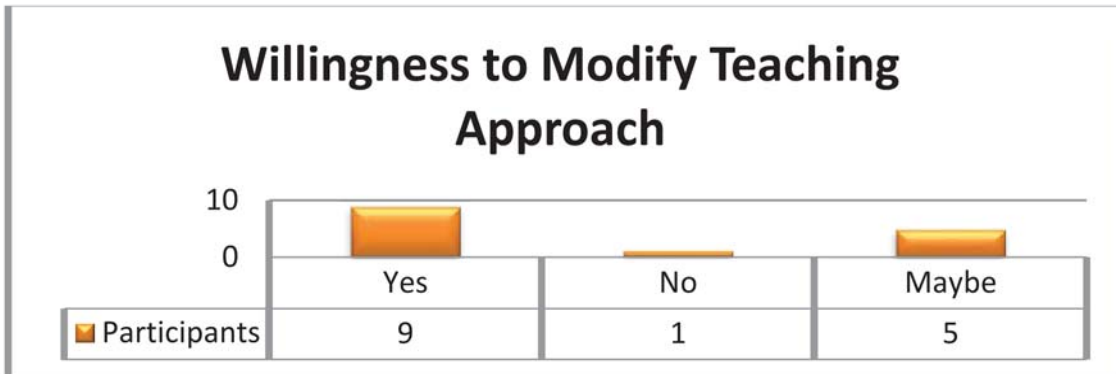
4. Findings and Discussion

In this regard, the study's findings provide a replicated and complex understanding of the ICT faculty members' perceptions of the positive

and negative aspects of adopting ICT to improve the quality of education at the Higher Institute of Science and Technology Badr.

The quantitative survey data was conducted using Google Forms, the number of participant was **20** faculty members including (adjuncts and collaborators); this indicated that out of all the respondents, **75%** while the rest show no positive interaction.

Indicator	Percentage	No.
Faculty members reported significant advantage in teaching and learning practices with ICT system implementation	75%	15
Faculty members show no response	25%	5

Table1: illustrates the percentage of faculty member response

The following charts show the response received for questionnaire:

ICT Integration Benefits

	Extremely beneficial	Very beneficial	Moderately...	Slightly beneficial	Not benefici...
■ Participants	3	5	4	2	1

Challenges in Adopting ICT

	Insufficient training	Resistance to change	Lack of technical...	Outdated infrastruct...
■ Participants	7	3	5	6

Preparedness for ICT Integration

	Not prepared	Somewhat prepared	Very prepared
■ Participants	4	8	3

Willingness to Modify Teaching Approach

	Yes	No	Maybe
Participants	9	1	5

The responses show an overall optimistic view of the advantages of incorporating ICT into teaching methods. 53% of participants in total rated the benefits as either 4 (33%) or 5 (20%). This indicates that most people view ICT as a beneficial supplement to their instructional techniques. Nevertheless, a significant 20% gave it a rating of 1 or 2, suggesting that some teachers may have doubts about the actual benefits of ICT in their classrooms. This contrast emphasizes the necessity for more education and proof to showcase the efficiency of ICT tools.

The difficulties identified are typical obstacles experienced in educational environments. Lack of proper training was identified as the most significant challenge by 47% of respondents, followed by out-dated infrastructure at 40%. This indicates that educators may understand the advantages of ICT, but frequently do not have the required assistance and resources for successful implementation. Furthermore, 33% expressed worry about their lack of technical skills, highlighting the significance of on-going professional growth. 20% of educators showing resistance to change suggests that there may be a reluctance to modify their current teaching methods, but this could be tackled with specific change management approaches.

The responses also show a combination of readiness levels. Although 53% of educators feel adequately ready to incorporate ICT into their teaching, only 20% feel highly prepared. This indicates that although educators are open to using ICT, they may need more skills and confidence to use it efficiently. The significant area for intervention is emphasized by the 27% who do not feel prepared, indicating that targeted training programs may help enhance their ICT tool readiness.

60% of participants are willing to adjust their teaching methods to include more ICT tools, indicating a positive outlook for future integration efforts. The 33% who responded with "Maybe" have the potential to become advocates with proper assistance and training.

Nonetheless, the 7% who are resistant to change represent a minority of teachers who might require additional persuasion regarding the advantages of integrating ICT in their teaching practices. This highlights the significance of continuous conversations on the importance of ICT in improving education.

While the interviews and the focus group discussion, the qualitative data helped me understand faculty members' experiences and their suggestions in a significantly better way. The interviews also yielded the information that a majority of the interviewed faculty members had positive attitudes toward ICT and its potential use in their teaching practice; however, the interviewees reported typical difficulties in the effective implementation of ICT, which resulted in the inefficiency of the technologies employed. Issues such as the need for extensive faculty development programs, staff support and technical help desks, and the correct correlation between ICT implementation and the institute's objectives and plans were also further brought out through the conducted focus group discussion.

Therefore, by integrating the results stemming from the quantitative and the qualitative data sources of the study, the paper offers a complex and multiple-dimensional picture of the faculty members' perceptions of the affordances and the limitations of ICT use in this particular context of higher learning institutions..

Challenges	Description
Out-dated Infrastructure	Most of the existing infrastructure is out-dated and not suitable for effective ICT integration
Lack of Faculty Preparedness	Faculty members are not well-equipped with the necessary skills and knowledge to use technology effectively in their teaching
Resistance to Change	Some faculty members are resistant to adopting and integrating new technologies in their teaching practices

Table 2: demonstrates challenges of implementation ICT in HIST Badr

The results of the present study are in full correlation with the results of studies conducted earlier, which indicates that although faculty

members commonly admit the tremendous potential of using ICT in the teaching and learning process, they do encounter a number of pragmatic and psycho-cultural challenges which hinder the smooth adoption and application of ICT investments in the teaching-learning process. This paper is significant in that it examines these senior issues within the specific background of the Higher Institute of Science and Technology Badr which is a specialized higher learning institution with an emphasis in science and technology. Through offering these important and situated findings, the research can credibly contribute to the important policy and practice questions in present and anticipated faculty development efforts at the institute to enhance the adoption and utilisation of technology-integrated pedagogy.

The study's main findings draw attention to the highly significant issue for the institute to embrace the developmental support to colleagues through extensive faculty development programmes aimed at securing and enhancing adequate digital literacy competencies as well as educational knowledge in ICT integration among teachers. Furthermore, the appointment of separate technical support personnel and facilities may be used to introduce and solve such practical issues as seen by the faculty with regard to the integration of ICT within the parameters of the institute as a whole The actual experience though has to reflect on the strategic plan and vision of the institute. Subsequent studies may further explore how it is possible to harness the best strategies that can enable the overcoming of the above multiple barriers noted in this study to enhance a positive attitude towards the use of technology and innovation in the Higher Institute of Science and Technology Badr.

Indicators	Findings
Attitudes toward ICT	Majority of the interviewed faculty members had positive attitudes toward the potential use of ICT in their teaching practice
Challenges in Effective Implementation	Its is reported typical difficulties in the effective implementation of ICT, resulting in inefficiency of the technologies employed

Faculty Development Needs	There is a need for extensive faculty development programs to help faculty members integrate ICT effectively in their teaching
Institutional Support Needed	It has been highlighted the need for staff support and technical help desks to facilitate the successful implementation of ICT
Alignment with Institutional Objectives	The focus group discussion revealed the importance of aligning ICT implementation with the institute's objectives and plans

Table 3: summarises the findings of the study

6. Conclusion

In conclusion, the findings obtained and analysed in the present study point out to a highly multifaceted and therefore rather nuanced picture of the faculty members' perceptions of prospects and issues of and with the use of ICT to improve the quality of education at the Higher Institute of Science and Technology Badr. As it is evident from this study, the majority of the faculty members acknowledge the fact that integration of ICT has the potential to bring about positive change in college education by making the teaching and learning process more interactive, enhancing the availability of quality educational resources on the internet and availabilities of; qualitative data that can be harnessed to support teaching and learning process. However, the faculty members are faced with a number of challenges that hinder the effective implementation of ICT in collegiate

The following key recommendations are derived from the study: There is a dire need for the institute to undertake extensive faculty development programmes, which will ensure that instructors are well equipped with the digital literacy competencies and the pedagogy necessary for integrating ICT into learning. Also, with regards to the technical support aspect its provision of dedicated technical support teams and systems may greatly aid in responding to the logistical issues facing faculty and significantly enhance the correspondence of the use of ICT with the institute's overall strategic plan as well as its general vision for using technology to enhance teaching and learning processes. By tackling these multiplexed barriers therapeutically, this institute can

positively influence the organisation's culture and instance the use, adoption, practice and implementation of innovation and technologies amongst its faculty staff thus ensuring that quality education is produced and availed to students and/or place them in a better position to respond to technology-driven world this century.

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