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Exploring the Role of ICT Resources and Teacher Competency in Student Engagement and Academic Performance in BCAED Student: A Sequential Explanatory Mixed Method

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Abstract

This mixed-method research study explored the Role of ICT resources and Teacher Competency on Student Engagement and Academic Performance of Pre-service teachers using a sequential mixed-method explanatory design. Data were collected from 60 respondents selected for the quantitative phase and 10% or 6 individuals of the respondents was used for the qualitative phase who met the qualification criteria. The quantitative results showed that students have high level of ICT resources, teacher competency, student engagement and academic performance and there is no significant difference in the overall responses of male and female students in relation to the aforementioned variables. On the other hand, analysis reveals that the respondents' ICT resources have no significant relationship with teacher competency, student engagement and academic performance indicating that the correlations between the variables have a very weak relationship. While the correlation between teacher competency and student engagement has no significant relationship. Moreover, the teacher competency has a significant relationship between academic performance and the correlation between student engagement and academic performance have a significant relationship indicating that the correlations between the variables have a strong relationship. Furthermore, themes have emerged from the qualitative findings supporting the result obtained from the quantitative phase, with the insights and opinion focusing on Pre-service teachers' high level and factors contribute to student's high level of teacher competency. These findings emphasize the importance of effective teaching in academic and the need for strategies that improve teacher effectiveness and enhance student engagement while ensuring equitable educational experiences for all students.

1. Introduction

1.1 Background of the study

In today's society, students have grown up with information and communication technology from a young age, and with time, the tools of ICT have become very important for providing quality education (Zhao & Chen., 2023). The higher education system has actually been greatly influenced by digital technology around the world (Hanaysha et al., 2023). Integration of technology in teaching and learning is an essential competency for teachers on the 21st century; it enables more active interaction in learning, more chances for collaboration and communication between teachers and students. ICT encourages initiative and creativity, helps make education more personalized, flexible, and makes it easier to learn knowledge (Ann et al., 2018). In addition, through a constructive learning approach, ICT enables students to focus more on higher-level concepts rather than less meaningful tasks (Fernandez & Mediavilla, 2021). Furthermore, for the development of human resources, education requires a strong sense of enthusiasm and responsibility (Yao et al., 2023). It is considered the building of knowledge as well as competency, and potential development has changed remarkably. Moreover, it is expected that students will be able to learn without any limitations in terms of time or place (Prasertcharoensuk et al., 2015).

With Teachers' Competency, it is significantly influences students' academic performance in schools (Kalim, 2024). Teachers play a very significant role because they prepare lesson plans that reflect their thoughts and ways of teaching, along with helping their students mature. (Nikou et al., 2023; San-Martin et al., 2022; & Zhu et al., 2023). Although much academic research has shown that student engagement is an important aspect of success, what drives engagement is still poorly understood (Korold et al., 2018). In fact, other studies stated that the most influential agents of academic success for students are the teachers (Bardach & Klassen, 2020).

Student engagement has long been recognized as a critical determinant of student performance and is defined as the level and nature of students' psychological, cognitive, emotional, and behavioral responses to both in-class and out-of-class academic and social activities aimed at achieving effective learning results. Engaged students often have a strong inner drive that motivates them to work hard in school, attend classes, and join other learning activities. They usually take part in class talks, use online tools for learning, share their thoughts, and are eager to learn new things. Committed students put much effort into their studies, which helps them succeed (Gunuc & Kuzu.,2015).

Academic performance is also an important indicator of how well students succeed in school, showing how much, they achieve their learning goals and abilities (Demir.,2009). Additionally, new technology has changed how colleges and universities connect with students and create a conducive learning environment that is vital for improving their academic performance (Sheard et al., 2010). Other studies have also shown that a teacher's competence is an important factor in improving students' academic success (Rockoff., 2004).

One possible reason for these different conclusions is the lack of adequate research on the aforementioned variables, which are still not well understood (Canales & Maldonado., 2018). Many

experts have cited the importance of ICT tools as tools for facilitating educational growth. However, one significant reason why ICT tools are rarely used in teaching is their insensitivity to the lack of sufficient knowledge among teachers, which impacts student engagement and academic outcomes at all levels, particularly for students from Bachelor of Culture and Arts Education. It is well known that the current technological world has prompted all governments to advocate the implementation of ICTs in higher learning to enhance performance in class among students. In the UAE, the government is trying to improve the education system by providing advanced technology. However, it is still unclear how these technologies impact student performance. One reason for this uncertainty might be that there is not enough research on this topic. Similarly, there is very little research on how ICTs affect students' performance in higher education, especially in developing countries (Karamti, 2016). This also applies to the current university, which has not conducted studies regarding the aforementioned components or its population, particularly in the program of the Bachelor of Culture and Arts Education.

Students in this program encounter minimal integration of technology in their educational program, even if they are digital natives. There are several interrelated reasons for this contradiction: knowledge gaps about how ICT affects student engagement and academic performance, insufficient training in digital pedagogy for teachers, institutional failure to address educator competency needs and limited research on technology effectiveness specific to arts education. The teacher aspirants are particularly affected by this research gap since there is no comprehensive study has explored the connection between these factors in this particular student population. In an area that may greatly benefit from the advancement of digital, this lack of evidence has hindered effective technological integration. Considering these identified gaps will help assess the four (4) components that are crucial in teaching and learning through the integration of Teacher competency, ICT resources, Student Engagement, and Academic Performance, this could help us measure the engagement and performance of students with their academics. It reflects how complicated the relationships among technology, teaching methods and knowledge that teacher aspirants might have in their respective subjects. Since this digital technology has become part of our daily life and new technologies pop quickly and begin appearing in classrooms, teachers must be very experienced at using and teaching their students in class how to use it to care for and support their students (Liang & Law, 2023).

1.2 Research Questions

This study aims to determine whether teacher competency, information communication technology have a positive impact on student engagement and academic performance among Culture and Arts Students in a University. This paper aims to answer the following research questions.

1. What is the level of Teacher Competency among the respondents?
2. What is the level of ICT Resources among the respondents?
3. What is the level of Student Engagement among the respondents?
4. What is the level of Academic Performance among the respondents?
5. Is there a significant difference on the respondents Teacher Competency when the data are grouped according to gender?

6. Is there a significant difference on the respondents ICT Resources when the data are grouped according to gender?
7. Is there a significant difference on the respondents Student Engagement when the data are grouped according to gender?
8. Is there a significant difference on the respondents Academic Performance when the data are grouped according to gender?
9. Is there a significant interrelationship among respondents Teacher Competency, ICT Resources, Student Engagement and Academic Performance?

2. Review of Related Reviews

2.1 ICT Resources

Information and communication technology (ICT) is an integral part of the education system today. There is a prolific stream of research that provides evidence of the positive effects that the use of ICT has on students' learning and, in turn, professional development for teachers in meeting the educational demands of today's knowledge society (Kounenou et al., 2015). ICT is regarded as one of the most vital tools for transforming education into the needs of today's information society (Maxim et al., 2015). In the modern age, ICT is used very effectively in teaching, learning, and testing and is a powerful tool for changing and improving education (Shipra et al., 2015). The ICT is now an essential component of education reform and a part of school subjects (Buabeng & Yidana, 2015). Furthermore, ICT is considered an important subject to learn and a major educational tool because it lays the foundation for what is termed 21st-century multiliteracy (Kruskopf et al., 2024). It also allows the exchange of information as well as its processing; in addition, it offers new means and methods, especially in communication (Hammoumi et al., 2022).

With the advancement of ICT over time, numerous studies have shown how it helps promote the success of students at school (Chiao et al., 2018). This is true not only for students but also for teachers, school leaders, and teacher educators (Gudmundsdottir et al., 2020). Building the ICT infrastructure gives students opportunities to take part in ICT-related activities and easy access to learning resources, which may help improve their academic performance (Li & Zhu, 2023). Researchers have suggested that if an ICT program helps students learn well and supports regular teaching, teachers may need to put in less effort to improve student performance (Bai et al., 2016). A more intense and better use of technology holds promise for improving the efficiency of schools, namely, their ability to maximize educational results for a given level of resources invested in their activities (Agasisti et al., 2023). ICT tools and skills are helpful in improving the learning of students. A detailed review revealed that technology in education has produced good results in different areas and subjects (Acosta et al., 2022). The digital competencies of lecturers are skills and practices necessary for lecturers to work effectively with new technologies in the teaching process. Competencies are regarded as tools for self-directed learning that enable lecturers to extend their knowledge and work (Ilomäki et al., 2016). Furthermore, another factor influencing ICT uptake is the self-efficacy of teachers because it requires a set of skills that change over time. Among these, one

crucial set is to be aware of the latest information and communication technologies and how to apply them in the classroom (Teo, 2015).

This study aims to enhance student learning and student engagement (Khlaif et al., 2021). ICTs also provide many opportunities and enable teachers to use a variety of teaching methods. Advances in technology have helped educators become skilled in its use. Furthermore, When teachers implementing technology creatively and thoughtful approach, they can adopt a positive attitude and enhance the learning experience for their students (Marchlik et al., 2021). Furthermore, ICT has transformed learning in all its contexts by improving student learning, supporting teacher development, and making institutions more effective. Although the advantages of ICT in education are well established, sustained efforts are required in building digital capacity, updating the infrastructure, and implementing effective implementation plans. Future research must maximize ICT adoption in various learning settings to achieve its maximum potential benefits in a fast-changing digital world.

2.2 Teacher Competency

Many studies have revealed that factors such as education, experience, determination, teacher ratings, and course preparation play important roles in improving student performance (Hammond., 2000; Milanowski., 2004 & Kane., 2008). Such competencies are necessary for adaptive instruction, which raises the levels of challenge adapted to each individual student. Teacher competencies are considered vital preconditions for the quality of instruction. According to (Zikuda & Fub., 2008) these competencies are conceptualized as hypothetical constructs that are developed mainly through a teacher's education, professional journey, and integration into the personality of the teacher. Furthermore, lectures are perceived as an inexpensive way to instruct numerous students and provide them with expertise (Dineke et al., 2004; Struyven et al., 2010). Lecturing is often used when a university teacher acts like a 'sage on the stage', speaking and displaying slides while students mainly listen and make notes. In lectures, students are mostly expected to sit for a long time while also understanding the material and thinking critically (Grant., 2019). When teachers support the independence of their students, they can increase inner motivation among students, thus improving learning and motivation (Ryan & Deci., 2000). Teacher behavior, such as teaching skills and pushing students to do well, together with student academic success and interest and a positive classroom atmosphere, is essential to students' happiness at school (Ed., 2000).

Currently, owing to the profound changes in our society, young people require talent and new fluencies. Education faces these challenges as well. The skills required to have a place in today's workforce change quickly, and the ability to work and live together must constantly be rebuilt. No education system can keep up with this necessity. Formal education, career advancement, and lifelong learning call for these skills. These are working collaboratively, critically thinking and communicating, being creative, and solving problems. All these apply to staying the course in meeting the adjustments and the new normal at the turn of the twenty-first century. A prime emphasis for enhancing teaching as an occupation in the future needs to be that of lifelong learning. The globalized world has its own set of problems, which should be handled by teachers, who must become lifelong

learners. They have to enjoy learning and hold the skills they will require throughout their lives. As lifelong learners, teachers are also flexible and are happy to make adjustments to changes from themselves as well as their surroundings. The most important part would, therefore, be teacher education for lifelong learning skills to be obtained by teachers (Thwe & Kalman., 2023). Another study indicated the digitalization and technology development have greatly changed the way people think, act, talk to others, and work. The rise of technology in the 21st century has changed learning places in education and, therefore, changed the students as well. Digital changes have made big differences in the world in education, especially pertaining to curriculum development and teaching methods. In the teaching-learning environment, technology provides opportunities for teachers and students to fit into the globalized digital era (Demissie et al., 2022). Moreover, educators need to combine their digital-age skills or competencies with their pedagogical practices (Cantabrana et al., 2019). Instead of merely aiming to be proficient in basic computer applications, teaching professionals must also effectively manage information, create content, and use technology to keep students engaged (Portillo et al., 2020).

These studies are crucial for the enhancement of quality in education and the improvement of students' performance. In essence, it allows the creation of knowledge regarding how various teacher competencies, including education, experience, and termination, influence instructional effectiveness and student achievement. Once these determining factors are realized, the researcher is able to describe the characteristics that contribute most to effective teaching practices. Moreover, it instills the concept of lifelong learning continuous professional growth. Research verifies that it is necessary for teachers and better equip their students with such skills as thinking, teamwork, problem-solving and using technology within educational practices is an essential direction of these investigations. As digitalization modifies learning environments, understanding how teachers can effectively incorporate technology into their pedagogy becomes vital. This accumulation not only enhances student engagement but also prepares them for success in the technology era. Additionally, the research underscores the importance of teacher competency, which promotes student motivation. By fostering an environment that encourages student autonomy, educators can significantly boost engagement and learning outcomes. This aspect highlights the dynamic relationship between teacher competencies and student success. These interconnected aims are essential, especially for enhancing the overall quality of education.

2.3 *Student Engagement*

Student engagement has been understood as a significant contributor to profound learning experiences (Goldspink & Foster, 2013). As a complex and multifaceted construct, student engagement may serve as an indicator for assessing the quality of learning outcomes (Baron & Corbin, 2012). The term "student engagement" refers to the time and energy a student puts into learning activities that enable him to increase the potential for desirable outcomes (Gunuc et al., 2022).

There are many definitions and conceptualizations of student engagement. This dimension has been recognized in the field of the pedagogy of education and the management of institutions in higher education environments (Kahu, 2013). There is a widely accepted conceptual framework that has three independent but interrelated dimensions: behavioral, cognitive, and affective (Fredericks & Jennifer, 2004). The first of these is behavioral, as it refers to acts demonstrating active involvement by students within the classroom context. These examples include listening carefully, following instructions, and

making an effort to complete tasks while cognitive engagement includes the use of metacognitive and deep learning strategies, such as planning, revising, and improving schoolwork, in organizing and enriching learning and affective engagement concerns students' emotions and attitudes toward learning and school, such as their interest in and enthusiasm for school activities, which gives them the energy needed to invest in the learning process (Skinner et al., 2008).

Another study stated that technology accessibility and use, university reputation, teaching motivational skills, and competencies related to implementing active learning are strong predictors of student engagement in higher education environments and given the educational ICT resources can improve students' motivation and engagement in the classroom and support "student-centered" instructional practices, the self-determination theory-based concept of "ICT engagement" was developed in response to the continued development of ICT and the growing body of research on student engagement (Almarghani & Mijatovic, 2017).

The importance of ICT-based curricula in teaching and learning and evaluates the connection between educational ICT resources and students' engagement in extracurricular and curricular activities to determine how well ICT is used in the classroom (Wang & Wang, 2023). Furthermore, emphasis should be placed on the complexity of student engagement and how essential it is for modeling learning outcomes and academic achievement. For both the students and the institutions, comprehending the factors and dimensions of engagement is very important, as it will help them create a more active learning-environment and better student outcomes. The way forward for research is to keep on investigating and coming up with innovative methods to engage students in various educational setting.

2.4 *Academic Performance*

Academic performance acts as an important indicator of success and effectiveness in the learning process, showing how well students achieve their educational goals and competencies (Cennet., 2009). Academic motivation is a significant factor influencing student performance in academic settings and investigations have revealed the connection between students' motivation and their involvement in behaviors that are academically focused, including studying, engaging in classroom discussions, collaborating with peers, and seeking out more challenging coursework for students (Allison & Helen, 2001; Robert et al., 2011). Additionally, learning and performance benefits were also observed in this research from the use of student strengths as leverage, exploration of interests, and promotion of personal goals (Beymer et al., 2020; Cellar et al., 2011; Flowerday & Shell., 2015; Waters., 2011; Wijnia et al., 2014). Moreover, research reveals that proactivity is critical in shaping the academic achievement of students (Ashforth et al., 2007; Kirby et al., 2002).

Another study reflects earlier conversations on educational achievement through the context of ICT-based education. For example, research has shown that although engaging in learning-related activities with ICT resources is strongly correlated with student academic performance, engaging in nonlearning-related activities is negatively correlated with student academic performance in Thailand

(Srijamdee & Pholphirul, 2020). Another different study indicated that academic engagement with ICT is negatively associated with academic performance, whereas entertainment engagement with ICT is positively correlated with academic performance (Hu et al., 2018). Teachers are encouraged to improve how they manage students' noncurricular activities and to offer clear guidance on how to use ICT resources effectively in school. This is an important issue that needs attention, as it can greatly impact students' engagement and overall learning experience. In addition, educators should create activities that help students develop the skills needed to choose and evaluate various educational ICT resources. Educators can develop the responsible and informed use of technology in their learning process by teaching their students how to skillfully and selectively use different digital tools and information which are most accessible to them. Concentrating on such areas will not only be a great way for students to improve their technological skills but, at the same time, will be a contributing factor to their academic success and will make them more ready for the future hurdles in the ever more digital world. Besides, this kind of method will lead students to being more active and effective learners (Wang & Wang, 2023).

The main goal of this study is to investigate the significant roles played by proactive learning strategies, academic motivation, and the effective use of ICT in the improvement of students' academic performance. The research points out the necessity for teachers to be aware of the interrelation of student motivation and engagement in learning activities through the consideration of these factors. The teachers who recognize the significance of these factors will thus be able to develop and implement such plans that not only include students actively in their learning processes but also keep them interested. This can enhance academic success and improve educational outcomes overall. By concentrating on nurturing a stimulating learning ambiance and promoting students' active involvement, it is possible to boost students' engagement and curiosity about academics. Besides, the proper application of ICT devices can render learning more accessible and engaging, hence, improving it. In the long run, this sums up a very comprehensive approach aimed towards helping learners achieve their educational dreams and develop the needed skills and competencies to succeed in the future.

3. Methodology

3.1 Research Design

This study was conducted to determine the Role of ICT Resources, Teacher Competency in Student Engagement and Academic Performance from the Culture and Arts students. The study employed a mixed-method explanatory sequential design. This design is a two-phase process in which the quantitative data are gathered first, followed by the qualitative data to thoroughly explain the findings of the quantitative data (Creswell, 2017). The data used in this study were gathered in numerical form. The study of Hanaysha et al. (2023) utilized a quantitative design in the first phase to quantify the variables in the study. The descriptive research design was used to determine the respondents' level of ICT Resources, Teacher Competency in Student Engagement and Academic Performance. This design also includes correlational methods to assess the strength of the relationship between two or more variables, and the study specifically examines whether there is a positive or negative relationship between the variables. This design determines whether there is a positive or

negative relationship between the variables. This study is also classified as cross-sectional because the data gathering process occurred in a short period of time.

In the second phase, the researcher utilized a qualitative design that encompasses various strategies, such as one-on-one interviews, group interviews, observations and a range of other investigative approaches (Hamilton & Finley, 2020). Employing this design, the researcher collects relevant information and data about the contributions to the high level of ICT Resources, Teacher Competency in Student Engagement and Academic Performance.

3.2 Respondents

This study investigates the variables among the Culture and Arts Education students. These students are teacher aspirants and specialize in teaching different forms of art.

The respondents of the study were randomly selected students across gender during the academic year 2024–2025. The researcher conducted a random sample of 60 culture and art education students enrolled in a university. A total of 50.0% of the respondents were male, and 50.0% were female. With a total of 60 respondents, the youngest respondents are 18 years old, and the oldest respondents is 24 years old.

3.3 Research Instrument

There is an adaption of research instruments happens from the prior research of Hanaysha et al. (2023) In which, there are 14 questions that are divided into four (4) parts that are equivalent to the study's variable. These include teacher competency (TC), information communication technology resources (ICTR), student engagement (SE), and academic performance (AP). The ICTR has 2 questions, whereas the TC, AP and SE have 4 questions, with a total of 14 homogenous items. The questionnaire was measured on a five (5)-point Likert scale: five (5) for strongly agree, four (4) for agree, three (3) for neutral, two (2) for disagree, and one (1) for strongly disagree. The researcher also conducts a reliability test, which is the Cronbach's alpha, to determine whether the instrument used is reliable. The reliability test reveals that the variable of ICT resources is not good, with a score of 0.316. TC has a score of 0.715, which indicates good reliability. Academic performance has a score of 0.821, which indicates good reliability. Finally, for student engagement, it has a score of 0.626, which indicates good reliability.

3.4 Semi-structured interview

In this qualitative phase, the researcher used semistructured interviews to collect data from the respondents. The researcher developed a semistructured interview consisting of warm-up questions, which asked about the demographics of the respondent and their consent to participate in the interview. This is followed by the interview questions, which address the respondents' factors that contribute to their high level of teacher competency. Finally, for clarity, cool-down questions are also

formulated. The interviews focused on only the 6 participants who participated in the quantitative phase. The semistructured interviews aimed to determine the factors that contributed to the students' high level of Teacher Competency.

3.5 Ethical consideration

The researcher informed the participants first about the study's purpose. All the consent was given to the participants, who were provided with a paper with the following details. The participants were given the opportunity to continue or withdraw from the study. The obtained questionnaires were then reviewed, and the researcher kept the participants' responses, which were stored securely and kept confidential to prevent leakage and unauthorized access to the data. For the qualitative phase, the researcher conducted interviews with the selected participants, which were recorded via audio recording to capture the participants' responses accurately. The participants' data, such as recordings, documents and interpretations, were kept anonymous, and the data were used solely for the purpose of this study.

3.6 Data collection procedure

In this investigation, the data were gathered via a five-point Likert scale, and the researcher used random sampling. The study was conducted during December 2024. The questionnaires were given by the researcher personally to the respondents. The respondent's participation was voluntary, and they had the right to withdraw from the questionnaire. The time it took for them to answer the questionnaire ranged from 5--8 minutes. The answers to the questionnaire were collected as soon as the participants answered. For the qualitative phase, the researcher chose 6 respondents who had participated in the survey to be interviewed. The researcher conducted multiple shots to ensure the reliability and accuracy of the data gathered.

3.7 Data analysis procedure

The researcher utilized the Statistical Package for Social Sciences (SPSS) version 20 to analyze the data. The respondents were also coded for analysis. 1 is used for males, 2 is used for females, and their ages are written in figures. The responses were also coded as 1 for strongly disagree, 2 for disagree, 3 for neutral, 4 for agree and 5 for strongly agree. To analyze the descriptive statistics of the variables, the frequency, median and standard deviation were used. The medians of the variables were examined via equal interval classification to determine the level of the variables among the respondents.

To determine whether the data were normally distributed, the Kolmogorov–Smirnov test was utilized. To determine significant differences in the variables, the Mann–Whitney U test was used, and for correlations among the variables, the Spearman test was utilized. The number of respondents was 60, and the result was 0.000, which is lower than the standard score of 0.05. This indicates that the items are significant; therefore, they are not normally distributed.

For the quantitative phase, the results were analyzed on the basis of their data, and inferential statistics were used. The study used the mean and standard deviation to interpret the data.

For the qualitative phase, the responses were transcribed in English, and thematic analysis was used to analyze and identify the themes on the basis of the responses from the participants. After the record interview and transcription, the responses were coded and grouped with their identified themes. These themes were combined, split and reviewed to ensure that the depth of the data was accurately captured. The participants were labeled as Informants 1--6, corresponding to their interview order.

3.8 Trustworthiness of the Data

The researcher informed the respondents about the study's purpose before conducting the interview, which was recorded via audio recording. Data such as the recordings and transcripts were stored and encrypted on a laptop. Notes and hard copies were secured in a cabinet accessible only to the researcher. The raw data collected from the interviews served as a basis for analysis to avoid biases.

4. Results and Discussion

Quantitative findings

4.1 Table 1. Descriptive analysis on the respondents' level of ICT Resources, Teacher Competency, Student Engagement and Academic Performance.

Variable	Median	SD	Interpretation
ICT Resources	4.000	0.722	High
Teacher Competency	4.000	0.458	High
Student Engagement	4.000	0.509	High
Academic Performance	4.000	0.437	High

Legend: 1.00--1.79 Very low, 1.80--2.59 low, 2.60--3.39 Moderately high, 3.40--4.19 High, 4.20--5.00 Very high

Table 1 presents the statistical data of the respondents' levels of ICT Resources, Teacher Competency, Student Engagement and Academic Performance.

ICT resources are high, with a median score of 4.000 and a standard deviation of 0.722, which indicates that students have good utilization of their ICT resources. According to Toma et al., (2023), good utilization of ICT tools at various levels of education allows stakeholders to generate an engaging learning atmosphere and increase the knowledge of students, whereas Hanaysha et al. (2024) reported that ICT resources have a direct and indirect impact on academic performance through student engagement. Moreover, ICT resources also enable academic staff and students to communicate with each other by allowing feedback and interactions.

In Teacher Competency, the respondents' level is high, with a median score of 4.000 and a standard deviation of 0.458, which means that they have a high level of teacher Competency to use as a conduit to their learning. Another study reported that teacher support plays a vital role in students'

positive psychological qualities through the motivation of students, words of affirmation, and awareness of students' learning, which could establish students' self-confidence, determination, and creativity as a result of fostering strength and constructive psychological traits (Li, 2007). Hanaysha et al. (2024) confirmed that teacher competency has direct and indirect impacts on academic performance via student engagement.

Furthermore, Student Engagement shows that the respondents' level of student engagement is high, with a median score of 4.000 and a standard deviation of 0.509, which implies that their engagement in their learning environment has a positive effect. According to the study of (Fan & Chan, 2022), students' academic engagement with the help of teacher–student interactions has a significant positive effect on their cognitive, behavioral, and emotional development. Moreover, Bolliger & Halupa, 2018; Song, (2022), reported that numerous researchers have studied the factors of student engagement within smart classroom environments, revealing that teacher–student interactions markedly enhance cognitive engagement, whereas student–student interactions improve students' behavioral engagement. Additionally, the study of Hanaysha et al. (2024) indicated that students' engagement can be reinforced when they have access to and make good use of the many ICT facilities available on campuses in HEIs. This suggests that ICT resources go beyond performing a basic role for the majority of students at HEIs.

Moreover, Academic Performance shows that the respondents' level is high, with a median score of 4.000, indicating that it is successful and effective in their learning process, as it increases their capacity to learn. Hanaysha et al. (2024) revealed that academic performance is positively affected by student engagement. This means that teachers can foster academic performance by ensuring that students have regular attendance, follow the policies, and develop positive attitudes toward them, management, and the institution as a whole. The studies of Waldeyer et al. (2022), Hamzah et al. (2017), and Rashid et al. (2020), have generally explored how time management plays a crucial role in students' academic performance. Researchers have examined the impact of time management, conscientiousness, and effort regulation strategies on students' academic performance, pointing out that conscientiousness is a trait transferred through these methods to performance.

4.2 Table 2. Significant differences in the respondents' levels of ICT Resources, Teacher competency, Student Engagement and academic Performance when data are grouped across gender.

Variable	p value	Interpretation
ICT Resources	0.255	Not significant
Teacher Competency	0.988	Not significant
Student Engagement	0.077	Not significant
Academic Performance	0.575	Not significant

Table 2 shows whether there is a significant difference or no significant difference between ICT Resources, Teacher Competency, Student Engagement and Academic Performance when data are grouped across gender.

In ICT Resources, there is no significant difference at the respondent level when the data are grouped across gender because its p-value is 0.255, which is higher than the significance level of 0.05, indicating that there is no significant difference when the variables are grouped across gender. In line with this, the study of Chen & Zhao (2024) suggested that with the advancement of ICT in education, students are working harder and spending more time on their studies. Additionally, ICT improves student responsiveness to learning and increases students' educational expectations in rural schools.

Teacher's Competency shows that there is no significant difference since the p-value of 0.988 is higher than the a-value of 0.05 showing that the advantage of having a good knowledge toward ICT, will most likely give the students the advantage of using it for academic purposes. Similarly, in the area of supporting the emotional development of students from Ukraine, almost 40 % of the respondents believed that their competencies were high, whereas just over 45 % rated them as sufficient. Teachers felt better prepared to implement activities that develop the independence of refugee students in their daily functioning, with over 36 % rating their competencies as high and just over half as sufficient (Cwirynkalo et al., 2024).

Furthermore, Student Engagement presents a significant difference in the respondents when the data are grouped across gender and shows that there is no significant difference when its p- value of 0.077 is greater than the a- value of 0.05, which means that it does not affect their engagement with ICT tools. In contrast, Goulet et al. (2024) claim that students who exhibit more aggressive, oppositional, and hyperactive behaviors are more likely to report lower levels of engagement because they are more acquainted with them, have learned traditionally and do not engage more on digital platforms.

Moreover, Academic Performance shows that there is no significant difference on the respondents' level when the data are grouped across gender because its p- value of 0.575 is greater than the a- value of 0.05. This means that, whether the subjects are rather hard, they still do good with their academics. Supporting studies also revealed that freshman students demonstrated a higher average score than did senior students. This finding indicates that students at the beginning of their studies tend to have greater academic success (Zhang et al., 2024).

4.3 Table 3. Spearman-rho correlation analysis of Teacher Competency, ICT resources, Student Engagement and Academic Performance.

Variables		p-value	Interpretation	r-value	Interpretation
ICT resources	Teacher Competency	0.176	Not Significant	0.177	Very Weak Relationship
ICT resources	Student Engagement	0.330	Not Significant	0.128	Very Weak Relationship
ICT resources	Academic Performance	0.50	Not Significant	0.254	Weak Relationship

Teacher Competency	Student Engagement	0.125	Not Significant	0.200	Weak Relationship
Teacher Competency	Academic Performance	0.000**	Significant	0.463	Strong Relationship
Student Engagement	Academic Performance	0.000**	Significant	0.450	Strong Relationship

** Correlation is significant at the 0.01 level (2-tailed)

Table 3 presents the Spearman-rho correlations among all the variables, which show that the results take two different perspectives, which are significant and not significant. The results reveal that the respondents' ICT resources have no significant relationship with teacher competence, with a significance level of 0.176 and a correlation coefficient value of 0.177, indicating that the correlations between the variables have a very weak relationship. This finding contradicts the findings of Bai et al. (2016), who reported that the use of ICT resources effectively enhances student learning and that teachers can improve students' academic success without requiring excessive effort or major changes in teaching methods. In essence, the good usage of ICT resources can simplify teaching methods, allowing teachers to work efficiently and effectively.

For ICT resources and Student Engagement indicates that there is no significant relationship, with a significance level of 0.330 and a correlation coefficient value of 0.128, indicating that the correlation between these variables has a very weak relationship. However, Li et al., (2020) reported that the performance of students is better, especially when educational ICT resources are utilized.

Furthermore, ICT resources and Academic Performance results that there is no significant relationship, with a significance level of 0.50 and a correlation coefficient value of 0.254, which indicates that the correlation between the variables has a weak relationship. However, the study of Sheard et al., (2010), stated that advancements in utilizing technology in learning have profoundly affected how higher education institutions can engage their students and establish a conducive learning atmosphere, which is crucial for enhancing students' academic success Mc Guiness and Fulton (2019).

Teacher competency and Student Engagement are statistically not significant, with a significance level of 0.125 and a correlation coefficient value of 0.200, which indicates that the relationship between the variables are weak. In the research of Lachebo et al. (2024), teachers must involve students in conversations and reflections on issues that matter within their communities. Such conversations enable students to assess their prior knowledge and to connect the old and the new knowledge. For example, if teachers are willing to identify their students' learning capacities and how students past knowledge complements current learning, then using the constructivism theory of learning would benefit both teachers and students. Therefore, teachers must shift and move from 'teacher-centered conversations' and find ways to interact with individual learners while solving real problems.

The results of the Teacher Competency and Academic Performance relationship show that there is no significant relationship, with a significance level of 0.000*** and a correlation coefficient of 0.463, which indicates that the variables have a strong relationship. Previous studies have shown

that establishing teachers' instructional competencies is strongly correlated with student academic performance (Kalim, 2024).

There is a significant difference between Student Engagement and Academic Performance, with a significance level of 0.000*** and a correlation coefficient of 0.450, which shows that the variables have a strong relationship. However, in the study conducted by Hanaysha et al. (2024), teachers may promote academic success by ensuring that students are attending class regularly, adhere to the classroom rules, and develop positive attitudes not just in class, but at the school overall.

5. Qualitative findings

The interview was structured with a single qualitative question—What are the factors that contribute to the students' high level of teacher competency? Responses were categorized and analyzed, revealing themes identified through in-depth analysis.

Theme 1: Passion for Teaching

Five out of the six respondents identified that passion for teaching is one of the key factors contributing to a high level of Teacher Competency.

The following excerpts are extracted from the interviews:

"…I truly enjoy teaching young learners… Despite struggles that I have faced, still I chose to woke up every day and filled myself with passion to help students learn in which this is what keeps me motivated to go on." (Informant 1)

"…Teaching is what makes myself feel alive; their excitement makes me driven to nurture them more deeply in their learning." (Informant 2)

"…Being a teacher, you are not just a task to inculcate knowledge to your students but also you must love what you are doing and be the safe place where students feel valued and motivated throughout their learning process." (Informant 3)

"…A passionate teacher is a big factor for students, especially in catering to their knowledge; I can prepare my lessons very well and use and create different strategies that could match their learning needs." (Informant 4)

"…The teacher innovates various teaching styles and invests several times in student success… Inspires students to pursue what their hearts desire." (Informant 5)

Informant 1 stated that joy derived from teaching young learners. Even though many challenges are faced, their commitment and dedication to waking up early each day with passion is a vital characteristic of a passionate teacher. This vital characteristic drives not only their teaching but also their ability to inculcate and enhance the learning experience of their students.

Informant 2 answered that the excitement of the students is a teacher's significant or great motivator. This connection highlights the reciprocal nature of teaching; when teachers feel alive through interactions with their students, it fosters a deeper nurturing environment, and students can also help teachers be more active in teaching. Passionate teachers thrive more energy, which inspires the students to invest more in their learning journeys.

Informant 3 stated that teaching goes beyond just delivering knowledge to students; however, it must establish a safe space where students feel valued, motivated and establish rapport between teachers and students in every aspect throughout their learning. This characteristic of a teacher is crucial for fostering a positive learning environment, where students are allowed to embark fully and explore their potential.

Informant 4 stated that a passionate teacher is an effective teacher where it prepares lessons and employs diverse and more creative strategies to meet the varying needs of students. According to (Berecksi & Karpati, 2018; Mullet et al., 2016), teachers tend to adopt a positive and democratic view of creativity at school. Furthermore, (Jeffrey & Craft, 2004; Selkrig & Keamy, 2017) creativity at school refers to the integration and promotion of pedagogical practices that encourage originality and innovation in students. This includes activities that stimulate divergent thinking and provide opportunities for self-expression and creative problem solving. This adaptability is crucial for sustaining various teaching techniques, ensuring that all students cater to the learning strategies they need because passionate teachers are committed to continuous improvement in their teaching methods.

Finally, Informant 5 stated the importance of innovation in teaching. Passionate teachers not only experiment with various teaching styles but also invest time in their students' success with dedication and eagerness to inspire students to prosecute their interests and aspirations, further emphasizing the role of passion in education.

In conclusion, this theme shows that a passionate teacher is not only devoted to conveying knowledge but also committed to establishing a substantiating and engaging learning atmosphere. This emphasizes that real passion in teaching involves fostering harmonious relationships with students, adapting unique teaching strategies to meet diverse needs, and encouraging learners to engage more and pursue their interests. This holistic approach enhances student engagement and success, highlighting the profound impact that passionate teachers have a crucial part of their students' lives.

Theme 2: Leveraging ICT Resources to Enhance the Learning Environment

Four out of the six respondents reported that teachers integrate ICT Resources in teaching is one of the key factors contributing to students' high level of Teacher Competency.

The following excerpts are extracted from the interviews:

"… Teachers can expand their teaching in using various ICT tools such as educational apps and make learning fun and more engaging inside the class." (Informant 1)

"… Integrating ICT tools is a big contribution to students most especially in access to a wealth of online resources, including research materials, tutorials, and collaborative platforms that enhance their learning experience." (Informant 2)

"… Integrating technology in the classroom could truly help students develop their essential digital literacy skills as well as the educators because, sometimes traditional teaching strategies can make students become bored and students in this generation are more reliant on technology-based… and with this strategy of teaching, it could help teachers to improve their skills in using technology in teaching and students can prepare themselves for future academic and career opportunities." (Informant 3)

"… ICT tools could be easier for both teachers and students in a learning environment where teachers can directly integrate various instructional strategies, making lessons or discussions more interactive and engaging and they could also more enhance their ICT literacy and allowing students' performance to be assessed directly and accurately to cater to the needs of the student." (Informant 4)

Informant 1 stated that ICT tools are very essential in teaching and learning (Molla & Seyoum, 2022). Furthermore, Hu (2023) stated that richness of smart classroom technology, we can find that with the continuous deepening of the testing depth of the smart teaching system in the classroom teaching quality, it can better arouse students' interest in learning also provides more comprehensive and sufficient learning resources for students' learning, which greatly increases students' interest.

Informant 2 answered that integration of ICT tools is significantly benefits the students, because, student can have easier comprehension of lessons and enhance the overall learning through the use of technological tools. Moreover, (Ronzhina et al., 2021) stated that, technology makes teaching more interactive and engaging and students can easily access a wide range knowledge of information and not just relying from the traditional way of teaching. Teachers are not just there to give information; instead, they support students as mentors and facilitators in their learning most especially in the digital age.

Informant 3 state that, it is essential to integrate technology in the, as this helps classroom both student and teachers promote and develop vital digital literacy skills and traditional teaching methods are increasingly viewed as outdated and often fail to capture student's attention. In this student's generation, learners are more inclined towards technology-driven approaches, making it crucial to adapt teaching strategies accordingly.

Furthermore, (González-Lloret and Ortega 2014) stated that using technology in classroom can lessen the student's anxiety, boost motivation and creativity also enhance student engagement in class participation. Moreover, (Golonka et al., 2012) ICT Resources into classroom environment can have a huge enhancement to student's motivation and boost their learning interest. Therefore, integrating ICT resources into classroom also help student to prevent boredom during their lessons or activities

and teachers can cultivate a more dynamic educational experience that students can actively involve as well as excited in their learning journey.

Lastly, the Informant 4 stated that integrating ICT could really help both student and teachers, ICT tools allow teachers to integrate various teaching methods more convenient and lessons can become more interactive, fostering greater student's engagement such as multimedia presentations, online discussions and interactive simulations. In today's world, familiarity with technology is increasingly important because ICT tools not only make lessons more engaging but also supports the development of essential skills and can facilitate directly and accurately, providing real-time feedback that can assess student's performance. By the help of ICT, educators can better cater to the diverse learning needs of their students and they could adapt different learning styles and paces ensuring a more effective educational experiences tailored to the needs of all students.

6. Conclusion

This study investigates both the quantitative and qualitative levels of culture and arts education students' ICT resources, teacher competency, student engagement and academic performance**.** The quantitative result shows that ICT Resources, Teacher Competency, Student Engagement and Academic Performance of the respondents indicated a high impact of these factors. These findings suggest that teacher's competency in integrating ICT resources have positively influences student engagement and academic performance. This emphasizes the significant role that both ICT resources and teacher competency play crucial roles in enhancing student's knowledge, learning experiences and academic outcomes, establishing their significant contributions in the field of education. However, the study revealed that there were no significant differences in teacher competency, ICT resources, student engagement, or academic performance when the data were grouped according to gender. These notable findings suggest that it does not play a role in affecting students' learning capacities within the educational environment; specifically, both male and female students are equally capable of benefiting from effective teaching practices and ICT resources. This advantage favors both students and teachers by making teaching and learning more efficient. While the correlation between teacher competency and student engagement has no significant relationship. This finding shows that though we have skilled teachers, it does not automatically lead to students more engage in learning and to boost student engagement. Educational strategies should also focus on understanding the unique needs and interests of each student. Moreover, the teacher competency has a significant relationship between academic performance. This suggests that when teachers possess strong knowledge skills and effective teaching strategies, students can achieve high academic outcomes. Furthermore, the correlation between student engagement and academic performance have a significant relationship indicating that the correlations between the variables have a strong relationship. The result shows that students can achieve a better academic result when the students are actively interested in their learning. Understanding the underlying factors of teaching competency, the availability and use of ICT resources, student engagement, and academic performance is important for enhancing educational practices. Educators and administrators must recognize how these elements interact and support one another in fostering a positive learning environment.

To gain deeper insight into the factors contributing to student's high level of teacher competency, researcher have performed qualitative analysis in which data are gathered and analyzed, resulting in the identification of key themes, passion for teaching and leveraging ICT resources to enhance the learning environment. A teacher with a passion for teaching is not only to enhance their student's learning but it inspires the students to strive more and learn creating a positive learning atmosphere that encourage student's academic growth. Additionally, leveraging ICT resources helps teachers to enhance their instructional methods and making learning easy and more interactive.

Overall, this study highlights the vital role of ICT resources, teacher competency, student engagement and academic performance and the key factors contributing to student's high level of teacher competency including a passion for teaching and leveraging ICT resources to enhance the learning environment. By focusing on these elements, educators can develop more effective strategies that cater to the needs of learners in today's modern education paradigm fostering a lifelong learning. To foster educational environment that promotes high teacher competence, schools should prioritize professional development that nurtures both passion for teaching and with the integration of technology in teaching and learning.

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