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Effects of Students' ICT Competencies on Their Research Capabilities and Productivity

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Abstract: *This study was conducted to understand the limits and impacts of the Effects of Students ICT Competencies on Their Research Capabilities and Productivity. The researchers gathered the data and evaluated a sample size of 88 Senior High School students in private school at Marilao, Bulacan during the school year of 2020-2021. Relatively the main tool in terms of gathering the data that was used in this research is a likert scale survey questionnaire on determining the effects of students ICT competencies on their research. The study made use of a quantitative research strategy, they were also reliable given its structured format providing fixed and linear results appropriate for the study. Using a questionnaire, from the book of "Overview of Qualitative and Quantitative Data Collection Methods" in 2017, was proven to define the insights of the respondents and its standardized nature enabled the researchers to make generalizations out of the results. According to the data that was investigated, it generally affected the students upon conducting a research in terms of creating adjustments, specifically in constructing a survey. The researchers were able to provide a different perception and information, it would help them, and it will be useful to formulate unprecedented approaches in the procedures of each method. The results of this study were also desired to assess the students with information on where they should prevent a bad situation and excel in improving regarding about their designated study. The intention of this research is to exclusively help the students who are in circumstancial difficulties about their research, concluding that utilizing technologies gave an adjustment period for most of the students since most of them are incapable and unfamiliar to begin with. The study recommended that students must be given a guidance in terms of the type of research that the teachers instigate, rectifying the errors, assessing their works and potential.*

Keywords—ICT Competencies, Research Capabilities, Research Productivity, Quantitative Study

1. INTRODUCTION

Teachers use instructional strategies to help students Global changes put pressure on Nations of the world to constantly acquire/apply new skills and techniques in teaching through adoption of relevant technologies to cope with trends of globalization. Education, with the help of ICT is at the confluence of powerful and rapidly shifting technological and political forces that will shape the structure of educational systems across the globe.

Previous studies on the relationship between the support and academic success of students' home and school Information and Communication Technology (ICT) has yielded unclear outcomes. It has been found that the availability of ICT services at school is irrelevant or negatively linked to academic achievement, whereas the availability of ICT resources at home has been found to be related to academic performance both positively and negatively [1].

ICT is often perceived as a catalyst for change, change in teaching styles, and change in learning approaches and in access to information [2]. In learning, the use of multiple information technology systems has become inevitable for learners. Students can recover the appropriate data within a limited period by using advanced information communication technologies

ICT develops students' new understanding in their areas of learning [14]. ICT offers more imaginative answers to multiple kinds of learning problems. In a literacy class, for instance, e-books are widely used in literacy aloud programs. Learners can easily access all forms of texts from phones, smartphones, personal digital assistants (PDAs), or iPads, from beginning to advanced stages. More importantly, these e-books can contain several reading apps that include a reading-aloud interface, appropriate vocabulary-building exercises, Games related to literacy ability and the learning of vocabulary, and more. ICT therefore provides purpose-built apps that offer creative ways to satisfy a range of demands for learning.

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2. RELATED WORKS

Today, a great number of experiences with educational technology in higher education exist worldwide, especially in the developed world. This has resulted in new opportunities in the integration of pedagogical and technological resources, which has enlarged flexibility across the learning process. It has equally improved the communication between lecturers and students and the interaction between different educational resources. [3] asserts that the use of ICT in higher education enhances student-centered learning.

The direct link between ICT use and students' performance has been the focus of extensive literature during the last two decades. Several studies have tried to explain the role and the added value of these technologies in classrooms

and on student's performances. The first body of literature explored the impact of computer uses. Since the Internet revolution, there has been a shift in the literature that focuses more on the impact of online activities: use of Internet, use of educative online platforms, digital devices, use of blogs and wikis, etc.

This literature shows mixed results. On one hand, some research demonstrates that there is no evidence of a key role for ICT in higher education [4] On the other hand, some studies show a real impact of ICT on students' achievement [7]

Looking at the link between ICT and student performance seems nowadays a misunderstanding of the role and nature of these technologies. In fact, since ICT is general purpose technology (GPT), it needs to be specified in order to meet the needs expressed by students and to be adapted to the local context and constraints [11]

A variety of models of usages can be identified leading to the same outcome. ICT brings widened possibilities for the learning processes that are independent from place and space. ICT also allows more flexible (asynchronous) and more personalised learning. It offers new methods of delivering higher education. Taking advantage of these opportunities needs a profound change in the organisation of the higher education system.

3. STATEMENT OF THE PROBLEM

This study aims to determine the effects of gaining knowledge or being competent in technology when it comes to doing research or being productive. In other words, this study's primary focus is on the effectiveness on students in ICT competencies on their research. Specifically, the study seeks to answer the following questions:

1.How may the students' ICT competencies be described?
2.What is the status of students' capabilities and productivity in research?
3.Does the students' ICT compentencies significantly affect their research capabilities and productivity?
4.What implications may be drawn from the findings of the study?

4. METHODOLOGY

The researchers collaborated and made used of the likert scale method of survey since this is primarily intrigued in describing relationships among variables. The study adopted likert scale survey design in order to establish the relationship that exists between the dependent and independent variable [12]. Moreover, this study is utilized to determine the ICT competencies of students on their research capabilities.

Primarily the research methods that are discussed and the other types of variables suited for this study is explained. A likert scale survey questionnaire is particularly chosen in order to simply collect the data regarding the ICT competencies of students to explain a proper justification or method. To identify a number of issues to consider when selecting questions, constructing questions, deciding on the type of question and finalizing the format of the questionnaire. [13]

The respondents of the study made a sufficient effort to clarify and provide distinctions to allocate the amount of SHS students in a designated institution, sorting out 88 SHS students during the school year of 2020-2021. As for the section of sample of the study, the researchers used convenience sampling technique.

Informations from the designed standarized survey questionnaire are formed and in another manner about gathering the data relunclantly for this study. The differences between the ten (10) questions in each two (2) sections determine the strategies specifically regarding about the ICT competencies of the students on research.

1.Questionnaires were then distributed to 25 students per grade through the use of Google Forms.
2.The researchers verbally introduced the study and explained its purpose to the respondents before they answered.
3.They were given ten minutes to answer the survey sheets.
4.The researchers often asked if they have questions and where did they need help in answering the questionnaire.

5.After the respondents were done answering, the researchers expressed their gratitude by giving their thanks to the respondents for participating and gathered all the survey.

The main objectives of this study were, firstly, to give an insight to educators on which of the two methods do the students prefer, through this, the researchers will be able to help the students formulate different approaches on how the students maintain academic achievement. Secondly, the study was conducted for its results to give the students an idea on where should they improve and how would they assess themselves better in order for these methods to work in increasing their opportunity to succeed in terms of their research.

5. RESULTS

ICT Competencies of Students in their Capabilities on Research

The competencies that students have been using for technological tools productively and ethically in the search and organization of information, in problem solving and collaborative work, as well as in improving their

communication processes, are vital for efficiently responding to the demands that arise in teaching contexts that significantly integrate ICT.

The 10 questions that integrate the perception of the students towards ICT competencies were divided into two main dimensions: Capabilities in terms of Research and Capabilities in terms of Productivity.

The integrated set of questions in table 1 and 2 values of between 1.0 - 4.0, which can be considered satisfactory since the mean value of the perception of the students towards ICT competencies is around 3.75. It is relevant to note that these data were obtained with respect to student's self perceived beliefs. The researchers validates this data with their relation with their real skills and knowledge about ICT.

Table 1. ICT Competencies of Students in terms of Research

Indicators	Mean	Interpretation
1) I feel confident learning new computer skills.	3.96	Agree
2) I find it easier to study by using ICT.	3.52	Agree
3) I am aware of the great opportunities that ICT offers for effective studying.	3.90	Agree
4) I think that ICT supported studying makes learning more effective.	3.98	Agree
5) The use of ICT helps students to improve with their research.	4.34	Agree
6) I think the use of ICT improves the quality of research.	4.28	Agree
7) I think the use of ICT helps to prepare students resources and materials.	4.14	Agree
8) The use of ICT enables the students' to be more active and engaging in the lesson.	3.68	Agree
9) I think the use of ICT in studying is a waste of time.	1.78	Disagree
10) I am confident that student's learn best without the help of ICT.	2.62	Neutral
Average	**3.75**	**Agree**

As you can percieve in Table 1 that the students' ict competencies in terms of research were prominently "agree" as shown by the average score of 3.75. Enabling to show the following sequence of behaviors of students whenever they engage or display their skills and potentials in experiencing or using advanfed technology. The highest mean score went to question 5 with a corresponding Likert interpretation of "agree". Question 9 got the lowest mean score with a corresponding Likert interpretation of "disagree"

The ICT competencies of students in terms of research capablities do not significiantly affect their Productivity in Research as evidenced by 0.2876 correlation coefficients.

ICT Competencies of Students in their Capabilities on Productivity

The ICT competencies in whereas the students recognized the need for further explore their strengths in regarding of their association with ict can be obtained in multiple informations and other forms of varied sources.

Meanwhile, the questions on Table 2 identifies the strengths and weaknesses of the students in productivity with the relation to their ICT competencies, implying complex topics and other personal mediums that relatively is distinguished by the students.

Table 2. ICT Competencies of Students in terms of Productivity

Indicators	Mean	Interpretation
1) ICT allows student's to be more creative and imaginative.	4.24	Agree
2) The use of ICT helps students to find related knowledge and information for their hobbies.	4.29	Agree
3) The use of ICT encourages students to communicate more with their friends.	4.37	Agree
4) The use of ICT increases students' confidence to speak out online.	4.08	Agree
5) I think students are still learning about ICT.	4.24	Agree
6) I think the use of ICT helps to broaden students' knowledge about social media.	4.32	Agree
7) I think the use of ICT helps to improve students' ability specifically in reading, writing.	3.82	Agree
8) The students are more behaved and under control with the use of ICT.	3.37	Neutral
9) The use of ICT enables students' to express their ideas and thoughts better.	3.87	Agree
10) The use of ICT promotes active and engaging lesson for students' best learning experience.	4.07	Agree

Average	**4.22**	**Agree**

In Table 2 showed that the students ICT competencies in terms of productivity were relunclantly mostly familiar and hands on with their engagement activities, interpreting the final as "agree" with a 4.22 as shown by the average score. Question 3 garnered the highest mean score of 4.37 which is interpreted as "agree" in the Likert scale. However, question 8 with 3.37 got the lowest mean score but still got the same Likert interpretation of "neutral".

The role of parents in the new learning modaloties does not significantly affect the students' academic perfomances as evidenced by 0.2391 correlation coefficients.

To provide further details on the manner in which students from acknowledged themselves as competent in various activities and in research relating to the use of ICT, the mean obtained for each question comprising the two different dimensions are presented. The activities and research progress in which students claim to be highly proficient and lower proficient are also pointed out.

ICT Competencies can be considered basic for platform for school performances or other activities. But this type of medium is related to activities such as interaction with others through the social media, looking through the web with ease, the application of tools used to find information from various sources, the productive use of applications and the use of the main informatics resources. Furthermore, stating that it is relatively prominent for students to implore their abilities in terms of this basis which can be done immediately or can be identified as much more accessible.

6. DISCUSSION

The expenditure per student in terms of ICT competencies are high and cohesive are for their activties and compensation for school related ventures. There has been some improvements in educational indices, also has little or no change in various aspects. Moreover, based on the gathered findings in the study, every spectrum has been allocated in different procedures and concluded with the following priorities. The effects ICT Competencies in terms of research were displayed as "agree" and evaluated as relatively helpful in some given circumstances and state for the students. Rating how it displayed as this type of medium is accessible, can be expressed and go in-depth through specific meanings regarding phrases and words, this also gives the students a chance to explore their capabilites in where they can improve more.

In the effect of ICT competencies in terms of productivity it displayed that the students "agree" on their final interpretation and it was evaluated with satisfactory and efficiency. Claiming that the students gain a high expression and ponder in the use of ICT in means of learning, producing efficient activities and use of social communication. Rates have been consistently lower for people with a tertiary education. To be educated up to tertiary level makes a significant difference in an individual's earnings. The students also felt the productive use of the various applications that were relunclantly introduced or offered. Although, their main key point is using this as a tool to obtain potential relevant informations and resources.

Referring to the data we gathered, the researchers can say that in some areas there were significant differences between the participants in reference to the students' perception regarding about their ICT Competencies.

It is relevant to remember that the competencies that has a relation to the use that is given to ICT is much more complex that it is profound. Activities such as the creation of work as a medium of expression, the planning, as well as the resolution of problems through digital resources, the participation in groups that use these tools and effective communication using a variety of informatics resources. So, it is definitely recommendable and a collaborative effort for developing strategies that promote the effective use of technology resources by students alike in order to improve and develop this type of ICT competencies.

7. CONCLUSIONS

Based on the gathered findings in the study, every spectrum has been allocated in different procedures and concluded with the following priorities. The effects ICT Competencies in terms of research were displayed as "agree" and evaluated as relatively helpful in some given circumstances and state for the students. Rating how it displayed as this type of medium is accessible, can be expressed and go in-depth through specific meanings regarding phrases and words, this also gives the students a chance to explore their capabilites in where they can improve more. In the effect of ICT competencies in terms of productivity it displayed that the students "agree" on their final interpretation and it was evaluated with satisfactory and efficiency. Claiming that the students gain a high expression and ponder in the use of ICT in means of learning, producing efficient activities and use of social communication. rates have been consistently lower for people with a tertiary education. To be educated up to tertiary level makes a significant difference in an individual's earnings.

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8. RECOMMENDATIONS

With the data gathered by the researchers, it can be implied that the role of the students in terms of research and productivity is that their behavior when engaging with advanced technology. Furthermore, students have been found to prefer utilizing ICT to study and create research easier. The collected information has also showed that students perceive ICT as a convenient tool to study with. The implication that advanced technology paves the way for students to increase their expertise in creativity and knowledge can also be made. Additionally, with improved skills through ICT, students can express their thoughts and ideas better.

The researchers suggest that ICT give more importance. Schools with adequate ICT assets accomplished superior comes about than those that are not well-equipped. There's a critical change on learners' exhibitions. At last, instructors ended up more persuaded that instructive accomplishments of students are due to great ICT utilize. Still modern innovations empower autonomous and dynamic learning, and students' obligation for their possess learning. ICT demonstrates that understudies who utilized instructive innovation felt more effective in school they are more propelled to memorize more and have expanded self- confidence and self-esteem. It is additionally affirmed that numerous understudies found learning in a technology-enhanced setting more fortifying and much way better than in a conventional classroom environment.

The use of ICT, students become more confident in communicating with their peers and family members online. The researchers relied on their respondents, Senior High School Students of Barcelona Academy, to provide data that would be conducive to reaching the group's objectives. The information gathered exhibits that ICT helps the student to expand their imagination. It can also be said that ICT engages the students to improve their conduct concerning studying, making for the best learning experience. Lastly, the evidences presented show that ICT helps to ease arduous studying amid the pandemic.

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