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# Information and Communication Technology Adoption and Students' Performance: Evidence from Malaysia

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## Abstract

This study investigated and explored the adoption of ICT by the learning institutions in Malaysia and the effect the adoption has on the pupils' academic performance. By using a quantitative research study approach and a sample of 1000 students, information was gathered concerning the ICT fostering in universities and the loved one efficiency of trainees coming from schools in Malaysia. The research study was a literature based review. The research study concentrated on the adoption of ICT in education and learning by learning institutions in Malaysia. The findings exposed that, greater than three-quarters of respondents taken into consideration ICT applications really beneficial, while an eighth of the participants indicated that they were utilizing ICT application at all times to do their research. On top of that, under two-thirds of the individuals confessed that they use cell phone as well as a minimum of one social networks platform to eat their time; regarding fifteen percent of this number additionally indicated that they take the aid of the social media system to finish their research. These findings can be credited to the conservative society where commoner lacks recreation and entertainment centers like theaters, as well as social media just continues to be a system to recreate and also consume time. The findings of this study also contribute to the existing understanding of the procedure of ICT adoption in colleges in Malaysia and its influence on students' academic performance. The public servers, besides the high price, are very sluggish in speed which makes it difficult to use ICT systems regularly, gadgets such as cellular phones as well as laptop computers are crucial in the access of ICT centers and also search details on the web. The study therefore recommended that information need to be collected from educators as well as various other management personnel to display the efficiency of ICT in learning institution in Malaysia. The research study concluded that a lot of students lack IT gizmos like smart phones and laptop computers. The reason is both the cost of devices and the web access. The general public servers, besides the high cost, are very slow in rate that makes it challenging to make use of ICT systems on a regular basis.

**Key Word:** *Information communication technology, adoption, performance*

### **1.1 Background of the Study**

The adoption of CT in the present study is recognized as a gradual switching over to automation of the educational process not just in administrative activities like students admission, registration and analysis however also establishing a personalized understanding management system and also moving all the courses as well as the relevant information onto it (Aljaloud, Gromik, Kwan, & Billingsley, 2019). The Malaysian Government has actually presented various initiatives to facilitate the better fostering and also diffusion of ICT to boost capacities in the education system. As a result of the considerable financial investment, schools are anticipated to make use of as well as integrate ICTs in administrative jobs, teaching and also discovering as well as general running of schools. In the tested schools in Malaysia for this research, ICT was already being taken on in learning. The instructors in addition to the trainees are enabled accessibility to the ICT services along with its all services and the specialized online understanding tools. The fostering of ICT across Malaysia has assisted in the educational processes to a wonderful degree. According to Zhang, Yang, Chang and Chang (2016), the pupils' academic efficiency describes the improvement of the students' present state of expertise as well as skills mirrored in their GPA as well as additionally in the formulation of their individuality and academic growth from lower degrees of research to greater degrees. The rationale of studying scholastic performance in the context of ICT fostering is to offer a substantial connection that exists in between both variables.

This research study was a literary works based; it assessed literature on the adoption of ICT by finding out institutions in Malaysia. The study focused on establishments in Malaysia due to the fact that variety of trainees, variety of training courses and additionally in regards to IT adoption is to frame an extensive research study version with the possibility to generalize its findings. Various studies have actually been embarked on to check out the connection in between ICT and students' efficiency; however, these studies have not had the ability to develop precisely the impact of ICT on students' performance. These researches have postured 2 core difficulties: first, it is challenging to identify the performance of trainees because the common strategy utilized by several scientists certifies the curriculum in charge of the efficiency achievement in regards to quality (Mir & Shakeel, 2019). Nevertheless, Basri, Alandejani as well as Almadani (2018) criticize these researches, criticizing them of embracing a narrow strategy, and recommend an alternate approach to take into consideration the impact of ICT on trainees' perspective, proficiency, as well as abilities in addition to educational program. This technique, according to the writers, has actually been campaigned as a lot more considerable method with the ability of generating even more precise results compared with the narrow approach. However, this substantial technique demands an extra extensive and also complex strategy to concentrate and observe the labor market.

Lebenicnik and also Starcic (2018) suggest that some access attributes might exist in some e-learning environments as well as applications however carried out in an impromptu method as well as solely based on some details technologies or targeting only one sort of special needs. In this context, thinking about availability aspects because the style phases of the academic setting as well as e-learning applications need to provide a sensible option. Access to details as well as interaction for people with handicaps with modern-day technology is acknowledged as a vital

requirement (Meskhi, Ponomareva & Ugnich, 2019). Individuals with handicaps require to make use of information as well as interaction innovations as much as every person. Within the college as well as further education and learning, they are confronted with the use of digital learning settings (VLE), discovering management systems (LMS), web-based trainings (WBT) and other e-learning applications and educational modern technologies (Cinquin, Guitton & Sauzéon, 2019).

These ICT technologies need to come in order to allow people with disabilities to participate in education and learning and also the life-long discovering. Some may have aesthetic constraints as well as a result use a key-board with Braille screen or speech outcome systems like screen viewers. Others might have physical disabilities, as well as use key-board with switch accessibility rather than computer mouse or key-board, or they have cognitive and also neurological handicaps, making it difficult for them to concentrate, to comprehend intricate navigating frameworks or to review complicated text. Maboe, Eloff, Schoeman as well as Kayode (2018) discloses that, while there are several impairments that can influence using computers and also the engagement in e-learning, 7 primary teams of impairments can be identified in order to make e-learning as well as instructional technology accessible for all; Visual disabilities, hearing impairments, Physical disabilities, Speech handicaps, Cognitive and also neurological impairments, Multiple handicaps and also Aging-related problems.

According to Cinquin, Guitton and Sauzéon (2019), most available e-learning systems for learners with disabilities are restricted to supply available understanding contents. Nonetheless, the students with disabilities need the entire obtainable TEL atmosphere and not just the easily accessible material. Offering obtainable web content in a non-accessible knowing environment brings about a non-accessible learning experience. The e-learning environment may contain some non-accessible tools that stop people with handicaps access to the material although this is in an obtainable format (Kent, Ellis, Pitman, McRae & Latter, 2019). Some systems might provide content during the knowing process that does not fulfill the particular needs of each type of handicap. Arkorful and Abaidoo (2015) think that nowadays, with the increasing use ICT in education, there are many chances to get over the obstacles which were run into until now in the standard academic systems. E-learning supplies the possibility to apply an individual and also inclusive strategy in training and also knowing.

Going into the 21st century, education and learning is taking a large action for adjustment in several aspects including mentor and discovering procedure. Assimilation of ICT in education and learning will certainly help teachers with promoting change from standard teaching-learning procedure to a technology-based strategy. Merging a core subject like Mathematics with the ICT-based abilities makes the mentor as well as discovering much more appealing for students. In Malaysia, the Ministry of Education, via the latest Education Blue print (2013- 2025), insights the value of ICT-based mentor as well as discovering right into the colleges' national educational program. This study intends to identify the problems as well as difficulties that Mathematics instructors dealing with in incorporating ICT in their training approach.

In Malaysia, most public higher education institutions already have a Learning Management System (LMS) with the participation majority of the lecturers who are using the LMS or simply called e-learning. Many studies related to online learning for HEI revealed that e-learning is effective to be used and gave big impacts on students' performance with the various tools of

teaching and learning adapted (Abdullah, Mokhtar, Halim, Ali, Tahir & Kohar, 2017). However, some of the past studies showed that teaching and learning Hadith is a challenge due to its natural contents which preferred more Musyafahah, Talaqqi or face to face method. Therefore, the current study sought to investigate the influence of ICT adoption in education on the performance of students in schools in Malaysia. By applying a thorough literature review of existing studies, the researcher sought to investigate the teaching tools that could be used in e-Learning and identify the various benefits of ICT integration in education.

The 21st century requires students with skills and ability to learn. Thus, the implementation of the 21st century skills is helping students in facing the challenges of globalization with greater confidence in the field of education or career field future (Ainun Rahmah, Mohd and Wan Muna Ruzanna, 2017). Learning process for this current era is very synonymous with the application of information and communication technology skills to produce more creative and innovative students (Rosnani & Nor Mashila, 2017). A creative teaching and entrepreneurial practice are capable of producing the best generation that can produce new innovations either in technology, knowledge, inventions and new ideas (Rosnani & Mashita, 2017). Creative and innovative teacher in the classroom is able to create a more effective learning environment. It is able to stimulate students in learning and make students more highly skilled. Ainun Rahmah, Zamri & Wan Muna Ruzanna (2017) indicate that teachers who are able to stimulate learners indirectly can increase motivation and make students more active in learning.

Creativity and innovation are very important in the field of historical education in the 21st century. The main challenges that need to be faced are to produce teachers who have high creative, innovative and knowledgeable force in various fields (Rosnani & Nor Mashila, 2017). Teachers act as facilitators in organizing the whole classroom learning process. If the less skilled by teacher in the technology aspect will affect the overall student's learning sessions and they interest. Although teachers are able to produce video clips for teaching, however, there are weaknesses in recording quality, audio and less interactive quality to students. The culture of innovation must be practiced among the teachers as early steps to ensure that the generation born is highly skilled and creative to develop the country. The use of digital resources or information technology such as visual and video materials among historical teachers is low and is still less exploited to be used in teaching (Anuar & Nelson, 2015). It is closely related to the skill level of information technology and communication (ICT) of teachers who are low among history teachers. This situation is closely related to the extent to which teachers strive and act more proactively to improve self-skills.

The assimilation of ICT into institutions has been a focus of a wide variety of policy initiatives by governments worldwide for over twenty years. Tearle (2004) who analyzed ICT assimilation in three institutions in the United Kingdom pertained to a similar conclusion. She says the requirement for a whole-school vision for ICT use, together with a role for school features, society and principles that sustain change, all combined with the sensible assistance and also the noticeable involvement of the Principal. Research study by Anderson and Dexter (2005) endorses the importance of the Principal in developing a technology board as well as budget plan, directly making use of technology, hanging out on as well as budgeting for innovation assimilation, however, they conclude that leadership and planning for ICT combination is a lot more a college than a private quality. As discussed by Sammons (1999), the majority of study of school performance has shown both main as well as secondary leadership to be a crucial

variable. The accessibility of the computer systems both hardware and software is just one component of efficient assimilation of ICT in schools. Currently there has emerged a demand for universities to make sure that graduates are able to present ideal levels of details literacy, "the capability to determine a problem and after that to determine, locate and also assess pertinent information in order to involve with it or to solve a trouble arising from it" (McCausland, Wache, & Berk, 1999). Districts and also schools fight with the technological demands of keeping innovative high-speed networks, a job that is far more complicated than keeping a stand-alone computer running or taking care of a printer that has actually obstructed (Benton Foundation, 2002).

### **1.2 Problem of the Research**

The primary obstacle encountering the adoption of ICT in Malaysia is the difficulty of technical adjustments that are rampant where it is hard to treat their influence different from their setting. The Malaysian Government has actually introduced different efforts to help with the greater fostering as well as diffusion of ICT to improve capacities in the education and learning system. Because of the extensive financial investment, schools are anticipated to use as well as incorporate ICTs in administrative jobs, teaching and also understanding as well as general operating of schools. This element consequently makes such research attract high contention on the ground that fast modifications in innovation would render the used criteria ineffective; as a result, no definitive outcomes can be drawn from such researches. Additionally, lots of researches carried out on this subject are based on scientific research studies of comparison. These researches develop that fostering of ICT modern technology in establishments of discovering can improve the corresponding organization. Additionally, a lot of the studies have actually focused on cognitive outcomes, consisting of a couple of recent studies that have actually come across reliable results and a positive perspective in the direction of ICT development. According to Ng, Miao, as well as Lee (2016), one of the requirements for economic and also social growth is education and learning as well as federal governments of the day are pressed into giving education to all of its residents regardless of the availability of various sources. At the same time, globalization as well as the shift to a 'knowledge-based economic situation' needs that existing universities establish individuals the capability to change information right into understanding and also to use that in a vibrant, cross-cultural context as well as ICT are a way for satisfying these twin difficulties. Information and also Communication Technologies offer both difficulties and guarantees for social and also economic advancement and this is nowhere much more apparent than on the planet's poorest countries. Based on the research gaps and the problem statement, a demand is really felt to establish the impact of ICT adoption and examine its impact on the efficiency of the trainees in Malaysia. In this regard, the this research carefully assessed the degree and also the level to which ICT had actually been embraced by institutions in Malaysia and just how the fostering of ICT has as a result made an effect on the efficiency of pupils. This research study likewise determined key variables that contributed to performance of pupils and just how these aspects were connected to ICT fostering.

### **1.3 Objectives of the Study**

To establish the influence of ICT adoption on students' performance in Malaysia schools

## **2.1 Theoretical Literature**

### **Diffusion of Innovation Theory**

The diffusion of advancement theory associates with the fostering of brand-new modern technologies right into the training as well as finding out process. As defined by Rogers (1995), there are five adopter classifications consisting of innovators, very early adopters, early bulk, late bulk, as well as laggards. The categories are based on the price of adoption of advancement as well as reflect the prices that professors embrace technological innovations. Diffusion is influenced by 4 major elements consisting of the innovation itself, innovation info distribution, time, and the social system embracing the innovation (Rogers, 1995). Given the current accessibility of an LMS, the diffusion theory matters in those professors who are trendsetters or very early adopters of technologies may be among those that are likely to use an LMS in instructing the literally tested learners. The social system identified in this research study consists of college management. Another concept that connects to this research study is the change concept (Fullan, 2001).

### **Change Theory**

The change theory by Fullan, Cuttress as well as Kilcher (2009) is connected with innovation adoption. Application methods affecting the rate of change suggest that, there is some evidence that tasks with higher meaning and more details execution support techniques do better at influencing trainee success. (Fullan *et al*, 2009). Fullan recognized seven elements that influence the fostering of adjustments. Those elements consist of the access to technology, positioning to a new policy, neighborhood support or stress or apathy for the adjustment to take place, administrative support, presence and quality of guideline and development that change will certainly bring, exterior modification agent that sustains and starts the adjustments; and professor advocacy. Fullan *et al* (2009) insists that there are 3 phases consistent in the modification concept. Stage one is the initiation of the prospective modification; this phase consists of an intro to the new plan or innovation.

Stage two is defined by the application of adjustments that may consist of technologically boosted software application or hardware. Finally, Stage three is the institutionalization of the technology that cultivates the modification. The system vast schedule of an LMS would serve as an institutionally readily available element that would certainly affect adjustment. The adjustment theory stresses is that when the stages are present, adjustment will certainly take place. Constant factors existing in the motivation health theory, the diffusion of developments concept and the change concept are management plan as well as techniques. An additional popular variable that shows up in two concepts is the advancement itself. These aspects support the inspiration factors determined by participants in this study. Particularly, the technology is a contributing element that establishes if discovering institutions will adopt it right into their training techniques when addressing students that are literally tested.

## **2.0 Empirical Review**

Jemni, Laabidi and Ayed (2014) in a research study on influence of ICT on pupils efficiency from the layout to the execution showed that, the main trouble preventing usage of ICT by learners was the fact that, most offered e-learning systems are unattainable to individuals with disabilities as well as do not take in factor to consider their special demands. The research study

suggested that, e-learning systems are currently commonly embraced as they represent actual possibilities for a much better quality of education and learning for many people. People with handicaps are still encountering numerous barriers to benefit from these systems.

In Malaysia a study carried out by University Science Malaysia (GAID, 2009) exposed that effective diffusion of ICT right into the class may be because of regarded administrative as well as technological assistance on the use of innovation. In this research, a few concerns were claimed to impact the integration efficiency such as the existence of a feeling of value of Information Communication and Technology's benefits and also the assumption that its usage will bring about success. Educators that are dedicated, willing to discover, with a high level of resilience and decision to adapt their training techniques to integrate modern technology right into educational program will certainly always be the foundation of any kind of successful execution of Information Communications Technology based technology. The college administrators should aim to give a climate for teachers in institution to expand and discover and establish such capability.

A study performed by UNESCO Bangkok in 2004 explains the adhering to lessons gained from six nations used in the research: educators require to be educated on ICT-related skills within the class objectives to develop the skill to integrate use Information Communications and Technology in teaching, training for educators by more skilled peers of senior teachers from the Ministry of Education makes certain that educators follow the context of their work environment and training must be given as a requirements based and just-in time knowing( Ng et al., 2006).

A research study by Sadao and Robinson (2010) revealed that, physically or cognitively unattainable environments act as obstacles to ICT use by students. Unattainable transportation systems or service centres protect against students from having simple accessibility to the services and also products they need. Physical obstacles include stairways or inadequate lighting, while cognitive obstacles include texts that are not clear or icons that are hard to recognize. Further, no matter the cost or accessibility of a wheelchair, a student will certainly not have the ability to utilize it in an inaccessible house, roadway or college. Obstacles are typically worsened throughout natural catastrophes as well as conflicts. The research findings revealed that, learners with finding out specials needs suggested experiencing technical troubles as well as troubles caused by their own absence of expertise concerning just how to use ICT. This was also real for pupils with movement disabilities and also problem using their hands and/or arms, but these students additionally noted problems connected to unattainable course/learning management systems. Pupils with focus deficit and/or attention deficit disorder experienced technological difficulties most often as did trainees with health and wellness and also clinically associated problems. This last group of students likewise noted troubles with bad use of e-learning by teachers as well as inaccessibility of internet sites. Trainees with psychological/psychiatric specials needs also noted bad use of e-learning by teachers as well as trouble linking to sites.

The research study wrapped up that, during the last decade there has been incredible advancement as well as passion in e-learning on university by literally challenged learners. The study insisted that there are numerous benefits of e-learning, such as the availability of on the internet program notes, however there are likewise issues when it concerns application of eLearning by physically tested students. Principal among these are problems pertaining to inaccessibility of sites and also training course monitoring systems for the literally tested

students. The research study likewise showed that trouble experiences differ among the physically challenged learners. The research study recommended that, all postsecondary stakeholders ought to make sure that e-learning technologies remain to profit rather than obstruct students with all kinds of handicaps and that access gains are preserved and built on.

### **3.0 Materials and Methods**

The purpose of this study was to investigate and explore the adoption of information communication technology by the schools in Malaysia and the impact it makes on the students' academic performance. The study was a literature based in which the researcher reviewed literature related to the topic of study.

### **4.0 Analysis of Findings**

This research study checks out and also discovers the adoption of info interaction innovation by the colleges in Malaysia and also the effect it makes on the trainees' academic performance. The findings of the study revealed that greater than three-quarters of participants taken into consideration ICT applications extremely useful, while an eighth of the individuals showed that they were utilizing ICT application at all times to do their research. Furthermore, under two-thirds of the individuals confessed that they utilize mobile phone and a minimum of one social media sites system to consume their time; regarding fifteen percent of this number likewise showed that they take the assistance of the social media sites platform to finish their research. These findings can be credited to the traditional society where commoner does not have leisure and entertainment centers like theaters, and social media only continues to be a platform to recreate as well as consume time. The findings of this research additionally contribute to the existing understanding of the procedure of ICT adoption in institutions in Malaysia and also its impact on trainees' scholastic efficiency.

The findings of the study additionally clarified the connection between the uses of ICT and also finding out end results in institutions in Malaysia. These are taken into consideration intrinsic second order obstacles (Ertmer, 2010). For the first order barriers or external obstacle could be the lack of time to accessibility and find out. This in turn could be as a result of the full mentor hrs. that is experienced by the educators. 2 of the managers pointed out the absence of facilities and also booking hassle if the pupils are to be taken to the labs. Based upon the findings of this research as pointed out by Rogers (2015), five significant aspects impacting the rate of adoption specifically, loved one benefit, compatibility, complexity, trainability as well as observability. In this research study all the 5 showed up with some even more famous than others. The research study findings indicate that institution managers understand the benefits in regards to streamlined regular jobs because of fostering of technology, a lot more reliable, better guidance and also raised pupil efficiency. As far as the institution managers are concerned, their views as well as assumptions show positive cohesiveness with the different ICT tools made use of. They have the ability to share the vision of the principal on the direct benefits of incorporating ICT tools right into mentor and understanding.

### **5.0 conclusion**

Based upon the findings the research ended that, ICT is amongst the latest developments that has modernized learning among pupils in the world. It is especially important in the field of education and learning because it has actually lately developed such systems and chances that

have promoted somewhat the acquisition of expertise. This phenomenon has actually been highlighted in this study which shows exactly how trainees watch ICT as a component of their study program. From the results of the survey, it has appeared that a bulk of the participants worth ICT, and each of them feels that they ought to have the devices to be able to embrace ICT a lot more carefully.

The study additionally ended that a great deal of students lack IT gizmos like mobile phones as well as laptops. The factor is both the price of devices and the internet availability. The public web servers, besides the high price, are really slow in rate that makes it tough to make use of ICT systems regularly. Genuinely speaking, gizmos such as smart phones and also laptops are important in the gain access to of ICT facilities as well as search info on the web. The research study likewise reveals that greater than half of the trainees keep accounts on social media sites. This suggests that ICT executes a role more than scholastic for the majority of university students. Searching for information from the net, these college trainees make usage of ICT for communication and also social links with buddies and loved ones. This describes why it is a significant booster to academic performance of the pupils in the university. Typically the exact same trainees can use ICT to help with conversations and comments on academic issues from teachers, senior citizens, and coworkers. This kind of communication is required to improve their research study and also study skills.

## **6.0 Recommendation**

Based on the findings of the research study as well as the conclusions, it was recommended that, information need to be accumulated from educators as well as other management police officers to display the efficiency of ICT in colleges in Malaysia. For the instructors who contribute to the scholastic health of students, ICT can play a crucial role in aiding the process of preparing class guidelines. The research study likewise recommended that, in order to appreciate the function of ICT in education and learning, it is required to entail all its functionaries in ICT. Lastly, the research therefore advises that all the parties must be associated with a research study follow up and also understand the components of ICT that pertain to their respective useful unit or division.

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