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# Increasing Technological Awareness Through Systems Development

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# Abstract

In lieu of the new millennium, and with the increase of the need for technological advancement in all sorts of operations, students would need the skill to cope up with the everchanging landscape which is faster than ever before. By harnessing their skill in Systems Development, the gap between professional competencies and student apprenticeship will be bridged.

This research focuses mainly on the use of available technologies to reach out to students in helping them build their first working system which they can tweak to serve different needs and demands of their perspective clients. By taking a more practical approach in teaching development, such as hands-on programming and debugging, students will be able to be immersed in creating their own systems and programs.

# Introduction

The role of Information and Communication Technology increased rapidly in recent times. In March 9 2020, the Philippine government issued Proclamation No. 922 which formally acknowledges a public health emergency, giving authority to local government units (LGU) to invoke their local disaster risk reduction management funds (Parrocha, 2020). This proclamation also ordered quarantine schemes which halted many businesses from operating, stopping majority of the economic sectors which results to the termination of industries and retrenchment of employees. However, the ICT sector has never seen a more important role as it was recently. According to Allyxon Cua, President of AMTI, "this pandemic presented the value of technology and innovation to moderate the adverse effects it brought." (ADVT, 2020) . This demand for ICT is reflected by the rise of video streaming contents. According to the VERGE, there is a 40% to 100% increase in demand for content related streaming across all platforms especially YouTube, Netflix, and Amazon (Alexander, 2020). Such developments will mainly be seen on developing countries. The United Nations Conference on Trade and Development (UNCTAD) in a report last September, said that while the pandemic dealt a "severe blow" to the services sector, particularly in tourism, hospitality, and retail, the ICT services sector will see windfall opportunities (Ibañez, 2020).

Unfortunately, the Philippines lack ICT Professionals or qualified personnel to meet these demands and opportunities. TESDA reported that expansions in ICT services lack qualified professionals who were both certified and experienced (TESDA, 2016). This also coupled with the increased drop-out rate of 11% across all basic and secondary levels since 2012 (Porcalla,

2017). There was also a decrease of 25% of ICT related course graduates since 2015 (Philippine Statistics Authority, 2018).

In terms of technological awareness, only 14.28% of Grade school and secondary school students have computers (Perez, 2016). This was one main factor as to why many students were not aware of technological advances and only know how to use them but not create. In terms of ICT Global Index, the Philippines was ranked 101 (2017), which was down from its previous rank ($100^{th}$, 2016) as per the ITU Global ICT Development Index (Philippine Statistics Authority, 2018).

This problem was also acknowledged by the Asian Development Bank, pointing the necessary steps of primary and secondary schools to step-up in making their students aware of technology and how it can be implemented to help solve social problems affecting many people (Asian Development Bank, 2020).

With these at hand, schools and educational institution should take into consideration how to make their students get more advantage of technology. By doing so, students will gain a deep appreciation as to how technology works and how it can be used to solve different social and economical problems.

## Methodology

Students should have a separate specialization on the development of systems and information handling. The following are the proposed tracks which will greatly enhance their skills and make them employable:

| **Subject Title** | **Subject Matter Focus** | **Goal** |
|---|---|---|
| Fundamentals of Programming | Basic programming and basic algorithmic appreciation. | To solve basic mathematical problems using computer algorithms. |
| | Focus will be on syntax and semantics of computer languages | |
| | Best Computer language: C++ and C | |
| Object Oriented Programming | Advanced programming methodologies in creating objects, functions, and methods. | To create their first working application and systems information |
| | Will focus in creating more advanced applications that deals with systems and information | |
| | Best Language: C-Sharp or Java | |

| | | |
|---|---|---|
| Web design and development | Industry related development and deployment of server-based applications. | To create their first complete system and environment |
| | Focusing mainly on systems performance and efficiency of design | |
| | Best Language: MERN Stack | |
| User Experience and User Interfaces | Mobile application development where the version or module of the system that was built can be accessible. | To create a mobile version of the complete system, or at least a module from that system |
| | Focuses mainly on the user-side experience and tools to increase user productivity. | |
| | Best Language: Android | |

The proposed subjects were to be administered during the academic year to enhance the student's capability in being proficient in the different programming languages existing in the industry. With this, the high demand of the businesses and industries can basically be met on a certain standard, making them aware that such technologies exist.

It is highly recommended that these subjects be an add-on full subject or the main focus of students who would like to pursue such career in the future. However, it is not recommended to spend time in lectures and theory discussion. As the nature of the subject, programming language is mainly effective as a laboratory subject wherein the students will get a hands-on experience on the implementation and construction of the programs and systems.

It is important for students who will take this to complete preceding courses as pre-requisite and not jump to subjects that are far more advanced. It will damage or confuse the learning track and may cause them to lose interest.

## Expected Results

After a semester of diving into the subjects, students were expected to be proficient in the aforementioned languages. They are expected to be more confident in building solutions and harnessing technology as a tool in solving different problems.

With this, it is also expected that the students will gain a deeper appreciation as how technology works and how it can be integrated in the society to introduce more efficient way of doing things. Students will also gain proper understanding on both technical and productive know-how.

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