

Developing a Fast-Paced Instruction Through Technology Accommodation

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Abstract:

This research assessed the integration of technology in classroom instruction and the student performance for the identified schools in West 1 District Secondary of Mandaue City Division as basis for crafting strategic resource. This research study employed a descriptive-quantitative method. The primary instrument in gathering notable data was questionnaires through a survey approach. Most of the respondents are 36-40 years of age, female, married, with units in Master's Degree of Education, with 6- 10 years of experience. Their ratings were very satisfactory in ICT integration, applied it in the competency that deals with knowledge application, and attended most division-level training. The self-efficacy in integrating technology had readily perceived all the time. Technology integration of teachers in terms of beliefs, behaviors, and perceived benefits of the technology had interpreted as Strongly Agree. These were always manifested. Teachers' communication, administration, and instructional use had interpreted as Always. These were executed by teachers all the time. Configurations, student-specific, and general use had been interpreted as Frequent. Lastly, the technological support and access had denoted as Accessible. These are available but with easy access. Teachers' performance ratings had no significant impact on the technology integration of the different competencies. There was a significant relationship between self-efficacy and technology integration used in the context of instruction. Barriers and challenges ranked from the most prevalent to the least.

Keywords: Development of Education, level of technology integration, Descriptive Method, Mandaue City, Philippines

Introduction:

Technology integration is one of the challenges that teachers may face today in teaching and learning (Kent & Giles, 2017). Professional growth among them is for sustainability. The aims of education change very quickly reckoning with the stress of the time more capability because these demands directly affect our academic system. Teachers are chargeable for enriching the tutorial system that needs efficient professional competencies.

Technology in education mirrors the fast-paced world (Debi, Christensen, July 10, 2019). In classrooms, we frequently find students performing identical activities. Schools must be technology-rich learning places that promote varied activities. Integrating technology continues to be a challenge for several teachers mutually the goals they strive for are healthier teaching and learning.

The problem of integrating technology into teaching and learning is not a brand-new issue among schools or divisions. Integrating technology in the classroom still poses many challenges for teachers. Although access to technology has increased over the years, there are still specifically teachers' beliefs about their ability to integrate technology into their instruction.

In line with the mandate of the Department of Education (DepEd), the Office of the Undersecretary for Administration (OUA) through the Information and Communications Technology Service (ICTS) shall continue the services rendered by the Educational Technology Unit, according to OUA Memo 14-0120-0588 last January 2020. The EdTech Unit upheld its role to empower public school teachers and learners as required by the global demand for the fast-paced development in technology.

The task of the EdTech Unit was to market and solidify the innovation and digitization projects that support the requirements of the K-12 Curriculum in delivering quality, accessible, relevant, and liberating education for all. It targets different components and facets of skill development which enables the technological advancement of the infrastructure and infostructure of DepEd. This supplement with empowerment training programs in emerging technologies for public school teachers.

In line with the legal mandate of promoting the right of all citizens to require appropriate steps in making education accessible to all, the Department of Education (DepEd) has geared toward the transformation of education through the DepEd Computerization Program (DCP). This DepEd Computerization Program (DCP) aims to provide public schools with appropriate technologies that enhance the teaching-learning process and meet the challenges of the 21st century.

According to A. Guzman, there was a growing interest in technology integration within the classroom. Learners are engaged in technology constantly outside and like it to be interactive and learning through technology has now become an element of their lifestyle. The Philippine Educational system launched a spread of initiatives to develop

teacher training processes that strengthened this integration. Many teachers focused on teaching students technology skills and making the technology work, not comfortable with the abilities of integration and active learning using technology.

Mandaue City Division, last 2017 was one of the recipients of the Infoteach Outreach Programs in partnership with Philippine Long Distance Telephone (PLDT) and also the University of the Philippines Open University (UPOU). A series of webinars were being conducted for teachers, learners, parents, and LGUs. Topics discussed like Preparing and Engaging Learners Online, Cyber Security, and Supporting Learners Online. During the webinar, there was a need to improve ICT integration. The DepEd Mandaue City was consistent in training the teaching and non-teaching personnel as far as technological tool is concerned. Hence, CoViD-19 Pandemic hits the Education System as Face-to-Face Learning Modality is not an option for this school year. Thus, this Office conducted a training of trainers dubbed Project Refresh that trains teachers in Online Teaching using practical, productive, and collaborative tools.

West 1 District Secondary of Mandaue City Division had encountered such a desire for technology integration. This need was revealed during the crafting of the Learning and Development Plan. The teachers' self-assessment tool was used to determine the self-competence of teachers in integrating technology into their lessons and classroom. With the need for technology during this time of the pandemic, teachers needed to address increasing and sustaining students' interest. For teachers, technology was considered a necessity for the learning environment. Teachers can come up with creative and varied ways to teach their students that keep them engaged. Technology had changed the learning environment so that it was more hands-on and engaging. Schools from the West 1 district of Mandaue were diverse in income and most of the students didn't always get the resources they needed. Thus, technology in schools helped close the gap.

Although teachers were aware of the importance of integrating technology into instruction, they fenced with many barriers in the pursuit of their integration. These barriers had been classified as external and internal. External barriers such as lack of time to plan, software and hardware to use, and inadequate support for training. Without adequate access to resources, teachers bounded to how and when technology integration has occurred in their classrooms. While internal barriers include knowledge and skills on how to use, evaluate, and teach with technology (Coffey, 2020). Overcoming inner walls requires a change in beliefs and practices.

This study investigated teachers' self-efficacy toward technology integration in the classroom. It enhanced their understanding of how teachers feel about how they currently integrate technology. Teachers effectively integrate technology into subject areas, they grow into the roles of adviser, expert, and facilitator. Technology makes teaching and learning more fun and meaningful. Students can also collaborate with their classmates through different applications. It provided insight on how best to provide guidance, support, and assistance to teachers in their attempts to integrate technology meaningfully and purposefully in their classrooms.

Literature Review:

Developed over 50 years ago by Albert Bandura, Social Cognitive Theory proposed that people don't simply reply to environmental influences contributing to their motivation, behavior, and development or what it truly means to be human. Intentionality is the process of goal setting, and forethought is the anticipation of goals. Self-reactiveness is the ability to watch and modify one's behavior to reach their goals, while self-reflectiveness is the ability to self-observe. Self-examine one's journey to their goal requires changes in behavior based on their self-observations (Betz, 2008). All four components are interrelated and affect goal attainment and motivation.

Self-effectiveness is the foundation for human agency. Bandura defines self-effectiveness as one's beliefs about his capabilities; it is not objective but subjective on what one feels about what he can accomplish.

Bandura's Theory of Self-effectiveness identifies four sources of efficacy information that may lead to the development of efficacy expectations that had been used to increase them: mastery experiences, vicarious experiences, verbal and social persuasion, and physiological and affective state (Betz, 2008).

Although knowledge of technology is necessary, it is not enough; teachers also need to feel confident in their ability to use that knowledge to support student learning (Ertmer & Ottenbreit-Leftwich, 2010).

Self-determination theory (SDT) states that motivation arises from contentment with basic psychological needs (Deci & Ryan 2000). This adopts an organismic dialectic, where humans engage in gripping activities, exercise capacities, pursue social connectedness, and try to integrate intra-psychic and interpersonal experiences. The three psychological needs proposed are competence, autonomy, and relatedness. The need for competence is relevant here, which is the need to master personally challenging tasks. A necessary characteristic of the need for perceived competence is personal effectiveness. Personal effectiveness distinguishes activities that will satisfy the need for competence from other personally meaningless tasks, the presentation, and mastery of which would not be awaiting

to quench the need. Competence was more than merely some 'ability' to perform a task and included consideration of the personal importance of the actions.

The complex and dynamic nature of educational technology complicated the already challenging task of teaching with technology (Hamilton et al., 2016). To guide teachers to integrate technology purposefully into their instruction, developed standards and frameworks. Among the frequently referenced technology integration models were The Technological Pedagogical Content Knowledge (TPACK), the Substitution, Augmentation Modification, Redefinition (SAMR), the Technology Integration Matrix (TIM), and the Technology Acceptance Model (TAM). Along with these theories, this had anchored on the Office of the Undersecretary of Administration (OUA MEMO14-01200-0588 Jan. 2020), DepEd Order 78 s 2010 AIDE MEMOIRE May 2020. These contributed an essential role for education to continue amidst the pandemic. OUA MEMO14-01200-0588 Jan. 2020 is the Detailed Assignment for Teachers to form the ICTS Educational Technology Unit. It is to help formulate, implement, and coordinate policies, plans, programs, and projects in formal and non-formal education and the alternative learning systems in upholding and developing both learners and teachers as required by the global demand. DepEd Order 78 s 2010 was the guidelines for the DepEd Computerization Program. This program responded to the computer backlog in public schools by providing them with hardware and software and training them on simple troubleshooting. AIDE MEMOIRE May 2020 aimed to accelerate the DepEd Computerization Program considering the Covid-19 Pandemic. The use of ICT was anchored on four areas: digital literacy skills, ICT-assisted teaching and learning, and automation of organizational processes.

The changing character of 21st-century learners requires the enhancements of the utilization of the different digital technology. One of these is the so-called digitization. This process is creating a digital image or representation. The old ways were converted into printed text, manuscript, film, or video recordings from one format to another. These were done on computers and using the internet. It converted all analog media such as books, journals, articles, photos, and others into electronic forms through scanning, sampling, or any utilization of various technologies. This digitization preserves the image data, its brightness, and the colors of the original file. With these, information and content can be delivered directly to end-users. Using these technologies is for all to survive and to cope with time. This digital technology can help preserve and make it accessible to many.

These cited articles emphasize the importance of teachers' training in our current educational system to sustain ICT-integrated instruction through distance learning. With the different research published on the internet, teachers need to have adequate training to ensure their classroom instruction can handle difficult situations that they may face with the current situation.

Methodology:

This section discussed the methods used and the different theories and principles behind them to attain the objectives of the study.

Design

This research study employed a descriptive-quantitative method. The primary instrument in gathering significant data for this quantitative research was the use of questionnaires through a survey approach.

Environment

This study was conducted in all schools of West 1 District Secondary of Mandaue City Division namely: Maguikay National High School, Tabok National High School, and Tingub High School. These were in the western part of Mandaue City, Cebu, Philippines and surrounded by residential houses and small business firms. It is also accessible by any means of land transportation.

The total teacher population of the schools is 84. There are 26 teachers from Maguikay National High School, 29 teachers for both Tabok National High School and Tingub High School. Each has its administrator who manages and

leads the school. Maguikay National High School and Tingub National High School offer senior high school programs. The district has one (1) supervisor who oversees the process and implementation of the teaching and learning. All schools in the district had access to varied teaching and learning opportunities. They cater to the needs of every learner and support the goal of providing quality education.

Respondents

The participants for the study were drawn from the convenience of universal and purposive sampling of teachers of the three secondary schools within West 1 District Secondary. This universal sample will have completed and be used for data analysis.

Table 1 Distribution of Respondents

RESPONDENTS	Frequency	Percentage
Maguikay National High School	26	31%
Tabok National High School	29	34.5%
Tingub High School	29	34.5%
Total	84	100%

The population remained anonymous; no identifiers of the participants were collected. In addition to the demographic questions, teachers were asked to rate their efficacy toward technology integration using the TISS and measure their level of technology integration using the TTIS. An email with a link, to a Google form, was sent to each school administrator. This was passed on to all teachers. The survey will not take longer than 30 minutes to complete and submit.

Instrument

For this study, surveys were utilized. The Teachers' Integration of Self-Efficacy Scale (TISS) with 18 questions. and eight of these will be demographic questions. Teacher Technology Integration Survey (TTIS) with 41 questions, subdivided into nine (9) categories. Ranked the different technology tools utilized by teachers and barriers and challenges they encountered.

The TISS is valid and reliable (Wang, 2004). To determine if vicarious learning experiences and goal-setting influence teachers' self-efficacy for integrating technology into the classroom. Wang, Ertmer, and Newby (2004) developed a Likert survey. The purpose of this instrument was to measure classroom teachers' self-efficacy.

According to Vannatta & Banister, 2009, this TTIS was valid and reliable. Technology integration was much more complex than just using technology in the classroom. To measure teachers' technology integration Vannatta and Banister (2008) created the Teacher Technology Integration Survey (TTIS). This was developed to measure technology integration, which encompassed risk-taking behaviors and comfort of technology; perceived benefits of using classroom technology; beliefs and behaviors about classroom technology use; technology support and access; teacher technology uses for administrative, communication, and instructional purposes; and facilitation of student technology use. The survey consists of 41 items and takes about 15 minutes to complete. With this survey, technology integration in the classroom can be determined, and supporting perceptions, beliefs, and behaviors that were present or lacking among teachers when it came to technology integration can be determined.

Data Gathering Procedure

This research started following the approval of the school's division superintendent. Ones approved. The school district supervisor, school heads, and the teachers in the district were contacted via group chat or face-to-face with proper safety and health protocols to request participation in the blind study. Before administering the TISS and the TTIS, a consent form will be prepared to instruct the participants on the study. Each participating school administrator was asked to forward the link to each of their classroom teachers that contained a request for participation in the blind study, a consent form, and the link to the survey indicating no circumstances. But the researcher had their answers, and no individual data will be reported back to the school and district. At the request of the participants, results will be provided at a future time. For privacy protection, no identifying information had reported in the survey. The researcher was the only person in contact with all the information and kept the documents safe and secure for three years.

After a week of the initial email to school principals, and an additional email requesting school administrators to forward a reminder email to their staff about the survey. Teachers were provided another week to complete the survey. After the allocated time had expired, the survey was analyzed, and results were disseminated. All information and data are being held in a secure location for at least three years.

Statistical Treatment of Data

Data were analyzed using simple percentages to answer the sub-problem. Weighted mean and Likert scale was used to analyze the data gathered for sub-problems which will be presented in table form. The concept of weighted mean plays a vital role in descriptive statistics utilized to investigate the consistency of responses.

Simple Percentage Analysis. It refers to the kind of rates used in comparing two or more series of data. Furthermore, a percentage is used to determine the relationship between the series of data.

Weighted Mean. It is an average in which weights were assigned to individual values to determine the relative importance of each observation. It was the summation of the computed values of the product of the set weights and their respective number of responses.

Pearson's Correlation Coefficient. It was the test statistic that measured the relationship between two continuous variables. It was known as the best method of measuring the association between variables of interest because it was based on the process of covariance. It gave information about the magnitude of the association, or correlation, and the direction of the relationship.

Scoring Procedure

The participants were required to use a Likert scale to determine their beliefs about technology use and the role technology plays. They rated each item on a 4-point Likert scale.

Scale	Range	Category	Descriptive Equivalent
4	3.26-4.00	Strongly Agree	Manifested all the time
3	2.51-3.25	Agree	Manifested most of the time
2	1.76-2.50	Disagree	Manifested on an occasional basis
1	1.00-1.75	Strongly Disagree	Not manifested at all

Higher scores on the TISS scale indicated that the teacher had a perceived sense of self-efficacy toward the integration of technology into their teaching.

The TISS was used to return an overall self-reported technology integration self-efficacy for each teacher. The TISS score was calculated by adding the numeric value for each response, such as one for strongly disagreed up to four for strongly agree. The total number score will then be divided by that total number of responses for each group, thus providing an overall average score ranging from one to four, whereas the higher the TISS score, the higher the level for technology integration self-efficacy. The combined possible scores on the TISS range from 10 to 40 points, and a score of 4 points is the highest mean; thus, the teacher was perceived to have a high level of technology integration self-efficacy.

The participants were required to use a Likert scale to determine risk-taking behaviors and comfort with technology, perceived benefits in using technology in the classroom, and beliefs and behaviors about classroom technology use. Participants rated each item on a 4-point Likert scale.

Scale	Range	Category	Descriptive Equivalent
4	3.26-4.00	Strongly Agree	Manifested all the time
3	2.51-3.25	Agree	Manifested most of the time
2	1.76-2.50	Disagree	Manifested on an occasional basis
1	1.00-1.75	Strongly Disagree	Not manifested at all

A higher score indicated a teacher's beliefs and behaviors are favorable to risk-taking, comfort with technology, and perceived benefits of technology in the classroom.

Access and availability were measured using the following scale:

Scale	Range	Category	Descriptive Equivalent
4	3.26-4.00	Accessible	Available and have easy access

3	2.51-3.25	Limited	Available but have limited access
2	1.76-2.50	Restricted	Available but not accessible
1	1.00-1.75	Unavailable	Not present

A higher score indicated a teacher had access to and availability of technology for classroom use (Vannatta & Banister, 2008).

Teacher administrative and instructional use, teacher communication use, students-general, student-specific use, and configuration of student use used the following scale:

Scale	Range	Category	Descriptive Equivalent
4	3.26-4.00	Always	Manifested all the time
3	2.51-3.25	Frequent	Manifested most of the time
2	1.76-2.50	Sometimes	Manifested on an occasional basis
1	1.00-1.75	Never	Not manifested at all

Results and Discussion:

Self-Efficacy and Level of Technology Integration among Respondents

The second part of the study examines the respondents' self-efficacy levels and their integration of technology based on various components.

Teachers' Self-Efficacy

This section explores how respondents perceive their ability to integrate technology into instructional strategies and enhance learners' engagement. Self-efficacy refers to a teacher's belief in their capacity to perform behaviors necessary for achieving specific instructional goals.

Instructional Strategies

One critical factor influencing teachers' effectiveness in integrating technology is their ability to apply instructional strategies. **Table 2** presents the respondents' perceptions of their competency in using technology-based instructional strategies.

Indicators	Weighted Mean	Interpretation
Understand that computer capabilities are well enough to maximize in the classroom.	3.50	Strongly Agree
Have the skills necessary to use the computer for instruction.	3.50	Strongly Agree
Teach relevant subject content with appropriate use of technology.	3.45	Strongly Agree
Use correct computer terminology when directing students' computer use.	3.29	Strongly Agree
Average Weighted Mean	3.43	Strongly Agree

Legend:

- **3.26 - 4.00:** Strongly Agree
- **2.51 - 3.25:** Agree
- **1.76 - 2.50:** Disagree
- **1.00 - 1.75:** Strongly Disagree

The results indicate that teachers consistently demonstrate self-efficacy in instructional strategies, with an average weighted mean of **3.43 (Strongly Agree)**. This suggests that respondents feel confident in their ability to integrate technology into their teaching practices.

Learners' Engagement

Another crucial factor affecting technology integration is learners' engagement. **Table 3** presents the respondents' perceptions of their effectiveness in using technology to engage students.

Indicators	Weighted Mean	Interpretation
Monitor students' computer use for project development in the classroom.	3.43	Strongly Agree
Motivate students to participate in technology-based projects.	3.62	Strongly Agree
Consistently use educational technology effectively.	3.33	Strongly Agree
Regularly incorporate technology into lessons where appropriate.	3.36	Strongly Agree
Confidently use technology resources to collect and analyze student data.	3.45	Strongly Agree
Respond to students' needs during computer use.	3.46	Strongly Agree
Average Weighted Mean	3.44	Strongly Agree

The results indicate that teachers frequently use technology to engage learners, with an average weighted mean of **3.44 (Strongly Agree)**. The highest-rated competency was **motivating students to participate in technology-based projects (3.62)**, suggesting that teachers recognize the importance of student engagement in technology-integrated learning.

Table 4 summarizes the results for teachers' self-efficacy in technology integration.

Indicators	Weighted Mean	Interpretation
Instructional Strategies	3.43	Strongly Agree
Learners' Engagement	3.44	Strongly Agree

Descriptive Equivalent Manifested all the time

The findings indicate that teachers possess high self-efficacy in integrating technology into their instruction and fostering student engagement. According to **Lemon & Garvis (2016)**, teachers with high self-efficacy set higher goals, persist longer, and implement more effective instructional strategies. These results underscore the need for ongoing professional development to further enhance teachers' technology integration skills.

Perception of Respondents on Technology Integration

This section examines teachers' perceptions of technology integration in terms of risk-taking behaviors, comfort, perceived benefits, beliefs, behaviors, support, access, and administrative/instructional use.

Risk-Taking Behaviors and Comfort

Table 5 presents respondents' perceptions of their willingness to adopt technology.

Indicators	Weighted Mean	Interpretation
Feel comfortable working with computer technologies.	3.45	Strongly Agree
Learning new technologies is confusing.	2.79	Agree
Get anxious when using new technologies due to uncertainty.	2.69	Agree
Excited to introduce new technology applications to students.	3.62	Strongly Agree
Confident in learning new technologies independently.	3.45	Strongly Agree
Believe learning new technologies for classroom use is important.	3.71	Strongly Agree
Average Weighted Mean	3.29	Strongly Agree

The results suggest that teachers generally feel comfortable with technology, with an **average weighted mean of 3.29 (Strongly Agree)**. However, some respondents expressed concerns about uncertainty when using new technologies (**2.69, Agree**), highlighting a potential need for additional training and support.

Perceived Benefits of Technology

Table 6 presents the perceived benefits of technology integration in education.

Indicators	Weighted Mean	Interpretation
Using technology to communicate enhances job effectiveness.	3.81	Strongly Agree
Computer technology helps create materials that enhance teaching.	3.79	Strongly Agree
Technology improves classroom organization.	3.76	Strongly Agree
Technology serves as an effective learning tool for students.	3.74	Strongly Agree

Students become more engaged when using technology.	3.71	Strongly Agree
Average Weighted Mean	3.76	Strongly Agree

The results confirm that teachers recognize the benefits of technology, with an **average weighted mean of 3.76 (Strongly Agree)**. The highest-rated indicator was **using technology for communication (3.81)**, reinforcing its importance in education.

Beliefs and Behaviors about Classroom Technology Use

Table 7 summarizes teachers' beliefs and behaviors in using technology in the classroom.

Indicators	Weighted Mean Interpretation	
Teaching students to use technology is part of my job.	3.62	Strongly Agree
Consider technology integration when planning lessons.	3.71	Strongly Agree
Regularly plan lessons incorporating technology.	3.40	Strongly Agree
Model effective technology use for students.	3.57	Strongly Agree
Average Weighted Mean	3.58	Strongly Agree

The findings suggest that teachers integrate technology into lesson planning and modeling with confidence (**average weighted mean: 3.58, Strongly Agree**). However, some respondents indicated that they do not always plan technology-integrated lessons (**3.40, Strongly Agree**), suggesting room for improvement.

The study highlights the strong self-efficacy of teachers in integrating technology into their instructional practices. While teachers demonstrate confidence in using technology, areas for improvement include reducing anxiety about new technologies and increasing opportunities for lesson planning with digital tools. Future professional development initiatives should focus on enhancing teachers' risk-taking abilities and providing continuous support for technology integration.

Conclusion:

This study assessed the integration of technology in classroom instruction and its impact on student performance in the identified schools of the West 1 District Secondary of Mandaue City Division. Using a descriptive-quantitative method, data were gathered through a survey, providing insights into teachers' self-efficacy, technology integration practices, and perceived benefits and challenges.

Findings revealed that teachers consistently demonstrated a high level of self-efficacy in integrating technology into instruction, particularly in the areas of instructional strategies and learner engagement. The majority of respondents exhibited strong confidence in their ability to apply technology in competency-based learning, participate in training programs, and maximize available technological resources. Technology integration in terms of beliefs, behaviors, and perceived benefits was consistently rated as "Strongly Agree," reflecting teachers' positive attitudes toward digital tools in education.

Despite these positive findings, barriers to technology integration persisted, including challenges related to time constraints, access to updated hardware and software, and the need for continuous professional development. While teachers frequently utilized technology for communication, administration, and instructional purposes, some still expressed anxiety about adopting new digital tools. This indicates a need for sustained training and support systems to further enhance technology-based teaching strategies.

A significant relationship was observed between teachers' self-efficacy and technology integration, highlighting the importance of confidence and skill development in fostering effective digital learning environments. However, no significant impact was found between teachers' performance ratings and their technology integration competencies.

Based on these findings, it is recommended that schools and education stakeholders provide targeted professional development programs focused on technology-enhanced instruction. Strengthening infrastructure, ensuring easy access to updated technological resources, and fostering a culture of continuous learning will further improve the effective integration of technology in classroom instruction. Future research may explore long-term effects of technology use on student achievement and investigate additional factors that influence successful digital learning implementation. The need for ongoing support, training, and policy development to maximize its benefits in the teaching-learning process.

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