

Teachers Adapting to Curricular Change: Basis for Teacher Education Curriculum Review

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Abstract

Implementing the flexible mode of instruction at all levels is a challenge to the educational system, especially to teachers who deliver subjects that are highly skill-based. This two-phase study investigated the strategies that enabled teachers to adapt to curricular change. Phase one of the study involved a phenomenological inquiry into the new demands of flexible delivery of TLE/TVL among secondary level teachers in the Philippines and the competencies that enabled them to meet these emerging demands. Data were gathered through semi-structured individual interviews with five teachers at the secondary level. Phase two of the study utilized the preliminary findings to review how the new teacher education curricula for TLE/TVL promote the necessary competencies to train teachers who are adaptable to curriculum change. Findings revealed that flexible learning modes demand teachers to explore creative and resourceful ways of delivering the same core practices such as teaching, assessment, and establishing connections with clients and stakeholders. Teachers meet these challenges through a combination of institutional training, resources, and personal learning initiatives. Further, opportunities to develop the competencies that teachers need to adapt to the curricular change are provided in the new teacher education curriculum. With the importance of self-learning and expansion of research skills development in the TLE/TVL teacher education curricula was then recommended.

Keywords: online, modular, blended, technology and livelihood education, technical and vocational education

Introduction

This evolving world require an evolving education that would ensure its continued relevance amid changes. Consequently, teachers as front liners in education delivery must not only be aware of the need for continuous change. They should also be equipped with the necessary competences to support and implement these changes.

Indeed, education's multiple functions including the qualification, socialization and subjectification functions (Biesta, 2009) are influenced by the changes in the global and local society such as globalization, technology developments, changing social values, and economic landscape, among others. For instance, the developments in the competencies, and skills required by the economy shaped the demands on how the schools should train graduates to be productive members of the local and global economy. It is clear that education affects the society and society affects education in an endless cycle. Hence, with continuous

changes in the society, it is expected that education will continue to evolve and reshape itself to meet the emerging demands of the new landscape. One of the education sector's means of adapting to the emerging demands is through the regular review and revision of the curricula. After all, a good curriculum should be evolving to respond to the emerging needs and demands of the learners and dynamic society (Villena, et al, 2015).

In the Philippines, two of concrete attempts to keep up with the non-stop change in the context of education include the shift to the K to 12 basic education program (Bongco & David, 2020) and the recent exodus of teaching and learning to the flexible modes of delivery in response to the COVID-19 pandemic. The former was a gradual process that involved a lot of time, budget, and collaboration with multiple stakeholders. It is quite true that a curriculum should be a product of long-term effort (Villena, et al, 2015). However, the latter was more of a “perturbation” type of change which compelled the whole system to adjust to the change at a limited period (Bilbao, et al., 2015). While the shift to flexible learning delivery mode only involved, modifications on select components of the curriculum such as the rationalization of content, and adjustment in learning experiences and evaluation, the short preparation time and mobility restrictions made the shift quite challenging.

Nevertheless, as Bongco and David (2020) along with many other educators and curricularists, emphasized, teachers are key players in implementation of any change in the curriculum, whether it be a change in the *whats* or *hows*. Too much focus on programs and missing the people factor could easily lead to failures in implementation. Hence, this study sought to explore the struggles and coping strategies of teacher as they shift to the flexible delivery modes. Since, curriculum is expected to be evolving in nature, it is expected that this is not going to be the last curriculum change that teacher will encounter in their careers. As such, findings on teachers' coping strategies were utilized to review how the new teacher education curricula for TLE/TVL promote the necessary competencies to train teachers who are adaptable to curriculum change.

Objectives of the Study

This study aimed to review how the teacher education curriculum for TLE/TVL could train teachers who are adaptable to curriculum change. Specifically, it sought to:

1. Identify the new demands of the flexible learning mode to the TVL/TLE teachers;
2. Describe how TVL/TLE teachers meet the new demands of teaching in the flexible mode; and
3. Evaluate TVL/TLE teacher education curriculum for competencies necessary to train teachers who are adaptive to change.

Methodology

This is a two-phase study. Phase 1 employed the phenomenological design in qualitative research. This design allows the researchers to look into the essence of experience (Creswell, 2007) of TLE/TVL teachers were explored to provide basis in analyzing the current teacher education curricula's sufficiency in preparing teachers to the delivery of the flexible learning modalities. On the other hand, Phase 2 involved policy curriculum review of for the teacher education programs.

Participants and Inclusion Criteria. This study involved the participation of TLE/TVL five male and female teachers through the social network to ensure their anonymity. The following inclusion criteria served as basis in selecting participants: (1) currently teaching TVL/TLE in the secondary level of the basic

education, whether public or private; (2) teaches using any of the flexible delivery modes of instruction; and (3) have experience in teaching in the face-to-face setting.

Table 1

Summary of the participants in terms of their age, sex, and institution

Participant Code	Sex	Age	Type of School
Participant 1	Female	31	Public
Participant 2	Female	36	Private
Participant 3	Male	22	Private
Participant 4	Male	38	Public
Participant 5	Female	44	Public

Participants gave their voluntary consent to participate in the study through an electronic consent form. All participants belong to young adulthood to middle aged in terms of life cycle generation. Among the five participants, only Participant 2 specialized in the field for their undergraduate program. Participants 1 and 3 took teacher education programs but specialized in Science and Mathematics respectively. Meanwhile, Participants 4 and 5 came from fields such as Nursing and Information technology before they moved to the teaching profession through the Continuing Professional development (CPD).

Instrumentation and Data Gathering. Data were gathered through semi-structured individual interviews. Questions were self-constructed by the researchers and were subjected to a series of validation before actual facilitation. To verify the relevance to the interview questions to the research objectives, expert validation was conducted. Four experts in research in the fields of psychology, teacher education, and basic education gave their insights on the relevance of the initial questions. These questions were revised based on the comments and suggestions of the expert validators. Upon refinement, pilot testing was conducted with a male, middle-aged teacher with 17 years of teaching TLE, among other subjects in the secondary level. The purpose of pilot testing was to check the instrument in terms of clarity, level of difficulty, and facilitation requirements. The participant gave positive feedback on the questions in terms of clarity and level of difficulty. The researchers, however, decide on the following refinements in terms of facilitation: (1) use of follow-up questions, (2) asking for the learning delivery mode (LDM) chosen by the participants schools, and (3) need to explore other possible demands on the teachers aside from the use of technology. Based on this two-phase validation, interview questions were finalized. Listed are interview questions used for data gathering: What is the actual work demands of you as a TLE/TVL teacher in this delivery mode? How are these work demands (in flexible mode) different from the demands of F2F? How did you obtain the skills required to meet these challenges? Interviews were conducted with the participants which lasted for an average of 40 minutes and 7 minutes. These interviews were conducted online through video conferences. The sessions were recorded for transcription, with consent of the participants.

Data Validation. Interviews were transcribed in Filipino. They were saved in a PDF file with line numbers for member checking. Truthfulness is essential to a qualitative study (Birt et al., 2016). Hence, prior to data analysis, researchers return these verbatim transcripts to the participants for their valuation. This is to give them the opportunity to add, delete or alter entries on the transcript. Member checking ensure that the data resonates with the reality of the participants in the study. Four of the five participants approved the transcript without revision. Meanwhile, Participant 5 gave an addition to the transcript. This additional information was incorporated to the transcript prior to the analysis.

Data Analysis. Data were analyzed verbatim using the QDA Miner Lite to organize the bulk of data (Saldaña, 2009). Initial analysis was done through the recognition of significant statements and applying descriptive codes. There was a total of 236 coded sections (including multiple codings).

Initial analysis generated a total of 27 codes. These codes were categorized under the Research Objective (RO) which they answer. Respectively, there were 12 codes that were generated under RO 01 (new systems, new assessment) and 15 for RO 02 (research, training, creativity). Second level analysis which clustered codes based on their similarities generated themes that answered the first two RO and provided a basis in analyzing the teacher education curriculum for RO 3. Second cycle coding generated three themes under RO 01 and two themes under RO 02.

Results and Discussions

This study aimed to explore the new demands in flexible mode delivery of TLE/TVL, as well as how teachers meet these new challenges. These data were used as the basis for reviewing how the current teacher education program could help develop the competencies needed by teachers to adapt to the curricular changes. Answers to each of the three research objectives were discussed in the succeeding paragraphs.

1. The new demands of the flexible learning mode to the TVL/TLE teachers

Data present three new demands in teaching TVL/TLE in flexible delivery modes. These are: (1) adapting to emerging technologies; (2) developing innovative strategies in delivering core teaching practices; and (3) dedicating more time for work delivery.

1.1. Adapting to Emerging Technologies

Schools have options in flexible delivery modes. Among the five participants, only those teaching in private schools reported that their schools focus on full online delivery. Other public schools offer more varied modalities in delivering instruction, especially in consideration of the resources of the schools, as well as the students. Nonetheless, regardless of the chosen modality for instruction, the majority of the work of the teachers migrated its operation to the digital platform, compelling teachers to be adapted to the emerging technologies. Participant 2 shared that they mostly rely on digital technology. When they are not familiar with the platform, they had to explore them.

For some teachers, especially those who specialize in ICT, this is a relatively smoother shift such as for Participant 4. This is also true to the younger adult GenZ teachers like Participant 3 who confessed that he did not really find it difficult to migrate to the online delivery mode.

He shared, *“I did not find it challenging to adjust because I am adept in using computers.”* These skills were recognized by their colleagues which made them a source of information and help when colleagues needed assistance in technology. Participant 4 shared, *“Especially for me as an ICT coordinator in the school. I must teach the teachers, as well.”* Similarly, Participant 3 who is not officially designated for the role shared similar experiences of being approached for help, *“Actually I am one of the people who is approached here if, for instance, a teacher is having difficulty with this or that...”*

Technology has indeed influenced many aspects of the society (Norcliffe, 2020; Potts, 2014, Popp, et al., 2010). With the pandemic, education too was forced to migrate to the online platforms, (Sun, Tang, Zuo, 2020). While online teaching was not adopted fully by schools because of context variations, other works like reports creation, submission, professional learning among others had to maximize the online platforms to proceed with delivery of education in spite of the limitations in mobility. This required teachers to engage in the digital world in greater part of their work. While all generations of teachers struggled with the adjustment phase, this shift was relatively easier for the Generation Z who were raised in an era where gadgets were nannies and pacifiers (Bongco, 2020).

1.2. Developing Innovative Strategies in Delivering Core Teaching Functions

Most of the adjustments teacher needed to deal with in using flexible delivery modes involved performing same core teaching functions but using innovative strategies that would take into consideration the new contexts such as the limitation due to the pandemic, along with school and student resources. These core tasks that teachers need to find new ways to deliver include systematic operations, teaching, managing “classes,” motivating students, assessing learning, and connecting with students and parents.

Participant 1 shared, “*We know that in TLE, we really need the skills... but it is so difficult to teach skills.*” This challenge was echoed by almost all participants. Another challenge in teaching the subject through flexible mode is the limitations of available resources. “*Unlike with face to face, they can assemble, disassemble because there are computers in school,*” Participant 4 said.

Another major concern among teachers is conducting student assessments that would yield authentic insights on student learning. Participant 2 echoed the concern of other participants “*.... we really don’t know if they really have learned or if they are really the ones who answer their quizzes.*” In practical activities, one common solution that the participants use to address this concern are video recordings. As Participant 3 shared “*My plan was for them to record a video of themselves while they were making their plates. Then we have rubrics. They will send it to me and I will grade based on that.*”

Finally, teachers also struggled to connect and motivate the students. Teachers recognize many challenges in establishing connections with their learners which might include the limitations in resources or lack of interest on the part of the students. In such cases, teachers reported the use of varied strategies and multiple modalities to communicate with students. They also use other routes to connect with the learners by contacting the parents of unresponsive students.

While it is true that aspects of teaching and learning remain the same regardless of the mode of delivery, variation in the context in the three of the important elements of teaching which include the learner, the teacher, and the learning environment (Corpuz & Salandanan, 2007) alters the ways by which these functions would be performed. Just as global and local contexts have shaped education through the K to 12 Program, this new context of the COVID-19 pandemic similarly altered the “hows” of education (Bongco & David, 2020) if not the “what’s” which makes it more imperative that teachers be innovative while deeply rooted to the principles of these core functions.

1.3. Dedicating More Time for Work

Teachers reported that the flexible delivery required them to render more time in accomplishing their tasks. This has basically intruded their personal life. Male, participant 4 shared that in the past, they go to work from 7:30 in the morning to 3:00 in the afternoon. When they go home, they could do everything else. However, with the flexible delivery, their work goes on until 8:00 in the evening.

Similarly, female Participant 1 shared, “*Before, we only work from eight to five, seven to four. We tend to work overtime now, compared before. You must keep on answering students’ queries even in the evenings.*” Similarly, Participant 2 shared, “*sometimes, students would ask questions even after working hours and you still need to reply to them.*” However, Participant 4 is also of the opinion that the demand for more time is not only due to the need to respond to the queries of students. It is also due to the reports required from teachers.

According to a study of Bongco and Ancho (2020) on the workload of teachers in small barangay schools, teachers were already working beyond the eight mandated working hours especially with several designations, compelling many teachers to take their work at home. With the work-from-home set-up, the distinction between domestic and productive has become less distinct. This clash of domestic and

productive spheres of teachers are challenging, especially so for married females (Bongco & Abenes, 2019; Bongco & Ancho, 2020). Nonetheless, because of their dedication to get the work done, they find ways to manage the demands even beyond their official hours.

2. TVL/TLE teachers overcoming the new demands of teaching in the flexible mode

Teachers showed that existing knowledge, skills, attitudes, and values enabled them to meet the new demands of delivering TVL/TLE in flexible modes. For instance, empathy and consideration helped teachers connect with the students in the new setting and deliver learning in ways that would respond to the context of the learners. Whatever skills and knowledge the teachers lack to deliver the new demands of flexible delivery mode, they learn them through institution-sponsored programs or through their own initiatives.

2.1. Existing internal resources

In the context of diversity in the learners' context, teachers have exhibited resourcefulness, creativity, and determination to meet the new demands of flexible learning mode delivery. Participant 4 shared how they exhaust every possible means to communicate with the students in order to deliver the lessons in spite of the limitations. Participant 5 further emphasized, *"You have to be resourceful."*

Willingness to adjust to changes and the growth mindset capacitates the teachers to continue to adapt to the flexible mode delivery. Participant 1 asserted, *"...I am eager to learn. I am adaptable and I accepted the situation, rather than complain."* Participant 3 also shared, *"...we just explore. We could also ask other people who are more knowledgeable."* Participant 4 who is more adept at using technology even hinted that creativity of teachers could compensate for their difficulty in using technology. He said, *"There are a lot of teachers who are not adept at using computers, but you will be inspired by how they deliver the lesson... it seems so easy for them to make the students learn using their technique. That's why I say that teachers could really develop strategies to make students learn, if their heart is in it."*

Other participants also acknowledged their education and experiences. Participant 1 shared, *"...my learnings in the principles of teaching helped me."* Further, Participant 5 mentioned how her experiences as a volunteer in a community activity helped her. Teaching is a profession that does not only require skills and knowledge but also professional and personal values. These competencies are developed through years of formal and informal learning, including pre-service to in-service trainings. As the Philippine Professional Standards for Teachers assert, a teaching career is a continuum (DepEd 2017). Anchored on the principle of lifelong learning, it is recognized that teachers continue to develop skills, knowledge, and values that enables them to perform their functions and respond to the educational reforms.

2.2. Acquiring New Skills and Knowledge through Institutional Programs and Resources

Among the demands that required the teachers to adjust most is the migration to the digital mode. Teachers however assured that their institutions provided training to capacitate them for this challenge. Participant 2 shared, *"We were trained on how to use the platform, how to implement it, and how to teach in the online platform."* Participant 5 shared that these trainings cover varied topics, *"There are topics about module, coping, how to adjust..."* Participants also shared that the institutional resources helped them adapt to the new demands. For instance, there are the internet connection which is more stable at school rather than at home (Participant 3) and free account from DepEd to access wider range of resources (Participant 4). Initiating change is typically confronted with resistance. Nonetheless this could be balanced with driving forces such as the administrative support (Bilbao, et al., 2015) through human and material resources. One

way to support teachers who are among the essential players in implementing change in education is providing continuous information support as active thinkers in the process rather than one-shot trainings which assume teachers would automatically understand the change policy and capable of implementing them should they want to (Blackman, 2016).

2.3. Acquiring New Skills and Knowledge through Individual Initiatives

Attempts to acquire new skills and knowledge to meet the new demands of flexible delivery does not end with the opportunities provided by the educational institutions. Teachers have showed personal initiatives to learn on their own. Two of the strategies that teachers use to achieve this is through connecting with colleagues and personal research endeavors.

Teachers see their colleagues as potential important resource to help them learn and adjust to the flexible learning delivery. Participant 2 shared, “...if there are problems, we seek help from the expert, the department head or the concerned teacher.” Meanwhile, Participant 4 shared, “I learned a lot of things which I could use in class and also share with my colleagues in school.” The idea is being connected or connecting with others. Participant 5, explained that amid the lack of resources especially during the start of the implementation, “I found module from another region.”

Another strategy that teachers employed to acquire skills and knowledge to adapt to the new demands is through personal research. These are not formal research projects but more of informal self-learning endeavors that teachers engage in to develop solutions to existing problems. As Participant 2 suggested, “Self-study and research. Webinars could not really teach us everything, so we still need to self-study.” Further, Participant 4 shared, “...if a teacher does not know how to explore, to search, the TLE teacher could find it a little difficult to teach.” Some of these problems that teachers felt the need to find innovative solutions are techniques, resources, and educational online tools (Participant 2, 5).

Teachers take own initiatives to resolves issues and problems whether it be gap in knowledge, skills, resources or need for new systems and pedagogies. As Siemens (2005) emphasized, in the digital era, “know-where” is vital for learning. Knowing where to access information when one is needed and establishing connections with such sources enables individuals to learn. These connections are not limited to online sources but also to human resources. Experts, leaders, and colleagues are all sources of varies important resources which could help teachers respond to the present and future challenges (Bongco, 2020).

3. Curriculum Review

Amongst the new demands in teaching TVL/TLE in the flexible delivery mode include adapting to emerging technologies, developing innovative strategies in delivering core teaching practices; and dedicating more time for work delivery. Teachers were able to meet these new challenges through the skills, knowledge, and values that they either already possess due to their background, past trainings, and experiences or developed recently through institutionally sponsored training or personal initiatives.

Analysis of the policies, standards, and guidelines for the current teacher education curricula for TVL and TLE through CHed Memorandum Orders 78 and 79, series of 2017 indicate that the current teacher education curricula trains skills, knowledge, and values needed for teachers to adjust in curriculum and educational reforms. These competencies necessary that support teachers’ adaptability to change are contained in the following aspects of the programs:

3.1. Skills in delivering core teacher functions

As emphasized in the earlier section, one of the adjustments that teachers had to make is finding creative ways to deliver their core duties. Despite the many adjustments in the delivery mode, the major

roles of teachers still revolve around the core functions such as facilitating learning, class management, learning assessment, providing support to the students, developing instructional materials, and connecting with students and parents. Regardless of the mode of delivery, these are core to the teaching profession. Teacher education programs for TVL and TLE provide opportunities for teacher education students to hone skills in these core functions through several professional education courses such as the Child and Adolescent Learning Principles, Facilitating Learner-centered Teaching, Assessment of Learning, Curriculum Development, and Building and Enhancing New Literacies, among others.

In-depth understanding of the principles behind these core functions allows the teachers to develop innovative ways to deliver them. These are also reflected in the program outcomes for BTLE and BTVTE. Specifically, one of its teaching programs emphasizes the skills to “facilitate learning using wide range of teaching methodologies and delivery modes appropriate to specific learners and their environments.”

3.2. Professional and personal values

Values also powered the teachers to shift to the flexible learning delivery mode. These values include empathy, responsibility, and dedication. It is notable that the current teacher education programs emphasize not only the skills, knowledge, and experiences that are vital for the training of teacher candidates. They also emphasize the development of values among the teacher education students. One of its program outcomes which is common among all teacher education programs aims to train students “*to practice professional and ethical teaching standards sensitive to the local, national, and global realities* (CMO No 79, s. 2017 p. 6).” This emphasized across the teacher education programs, but more specifically in the professional education course “The Teaching Profession.”

3.3. Lifelong learning skills and mindset

The current teacher education programs also promote continuous learning, consistent to the principles of the Philippine Professional Standards for Teachers which recognizes the teaching career as a continuum. In fact, one of the program outcomes of these teacher education programs is to “*pursue lifelong learning for personal and professional growth through varied experiential and field-based opportunities.*”

This is promoted through the professional education courses which connect the teacher candidates with the expectations among teachers through the national standards, where one of the domains is Personal Growth and Professional Development. This is also emphasized in the research courses under the program which develops lifelong learning skills of uncovering systematic solutions to problems in the field. However, CMO Nos. 78, 79, s. 2017 focuses research courses for BTVTE and BTLE students to technology research. On the other hand, data shows that TVL/TLE teachers had to deal with problems in relation to pedagogies and practices.

3.4. Creativity and collaboration

Another important skill that enabled the teachers to adapt to the change are creativity and collaboration. Creativity is not directly emphasized in the programs. However, focus on “innovative” processes requires creativity among participants. Similarly, collaborative skills are not directly emphasized in the programs. While these may be covered as among the transversal skills in the course “*Building and enhancing literacy skills across the curriculum with emphasis on 21st century skills,*” this appears limited.

Conclusions

Teachers in TVL/TLE were confronted with the new demands in the sudden shift to the flexible delivery mode of education. However, despite the lack of longer preparation, time, and limitations of resources, they still manage to adjust and deliver flexible learning through various skills, knowledge, and values. Even when the needed skills, and knowledge are not acquired, they manage to obtain them through varied means. While teachers appreciate the capacity building and resources offered by the institutions, it may be recognized as well that teachers have different levels of prior knowledge and skills. They also have varied learning styles or preferences. While some benefit through the series of webinars provided by the institutions, others learn more through self-exploration and research. However, since change is to be expected in the educational system, whether it be in curriculum or delivery formats, teachers should always be ready to adjust to the new challenges. It is therefore important that the teacher training programs are designed to hone skills that necessary for teachers adapt to the expected changes. Pre-service teacher education programs for TVL and TLE teachers include vital components that help teachers meet these challenges. For instance, rootedness to the principles of their core functions enables the teachers to deliver their roles even in diverse contexts and evolving landscape. Further, instilling the professional and personal values empower the teachers to embrace the challenge when skills and knowledge alone would not suffice such as sacrificing their personal time to complete tasks beyond official hours. Further, the emphasis on lifelong learning skills and mindset is one of the important forces that enabled teachers to survive the enormous challenge of shift to the flexible mode. It had been reported that teachers who were not able to adapt were forced to leave the system by retiring earlier than expected. On the other hand, those who had the learning mindset and skills found ways to adjust and respond to the emerging demands.

Nonetheless, there are aspects of the teacher education programs that could be reviewed to further help teachers adapt to expected changes in the educational system. For instance, creativity and collaboration could be integrated more to the overall program, seeing the important role that they play for teachers to adapt to the change amid varied contexts. While these skills could be contained in some areas in the program, articulating them explicitly as part of the outcome or framework would assure that their attainment would be targeted rather than incidental. Further, it has been found that TVL and TLE teachers, just like other educators had to resolve problems in the areas of pedagogy and practice. Teachers could be better capacitated to develop solutions to these problems if they would be trained in educational research approaches.

Recommendations

This study makes the following recommendations based on the findings and conclusions:

For the basic education institutions. Consider learning diversities among teachers and provide alternative professional development opportunities that would focus on the learning outcome, instead of the learning process.

For the teacher education programs. Articulate collaboration and creativity in the curriculum to ensure that its attainment is targeted, and training for general educational research skills to capacitate teachers to employ systematic processes to deal with problems in pedagogies and practice.

Acknowledgment

The authors are grateful for the blessing of the participants' confidence and validator's expert assistance.

References

- Biesta, G. (2009). Good education in an age of measurement: on the need to reconnect with the question of purpose in education. *Educational Assessment, Evaluation and Accountability*, 21, (1) 33–46
- Bilbao, P., Dayagbil, F., & Corpuz, B. (2015). Curriculum development. Lorimar Publishing. Quezon City, Philippines
- Birt, L., Scott, S., Cavers, D., Campbell, C., & Walter, F. (2016). Member checking: a tool to enhance trustworthiness or merely a nod to validation? *Qualitative Health Research*, 26 (13) 1802–1811 DOI: 10.1177/1049732316654870.
- Blackman, H. W. (2016). Teacher sense-making: A Case study of the implementation of the giffin model. Pennsylvania: Publicly Accessible Penn Dissertations. 2194. <https://repository.upenn.edu/edissertations/2194>
- Bongco, R.T. (2020). Intergenerational relationship building among Filipino teachers: a grounded theory. Doctorate Dissertation. Philippine Normal University.
- Bongco, R. T., & Abenes, R. D. (2019). Clash of spheres - the paradox of being a female teacher in the Philippines. *Beijing International Review of Education*, 1 (2-3).443-459. doi:10.1163/25902539-00102012.
- Bongco, R. T., & Ancho, I. V. (2019). Exploring Filipino teachers' professional workload. *Journal of Research, Policy & Practice of Teachers & Teacher Education*, 9 (2) 19-29.
- Bongco, R. T., & David, A. P. (2020). Filipino teachers' experiences as curriculum policy implementers in the evolving K to 12 landscapes. *Issues in Educational Research*, 30 (1) 19-34.
- CHED Memorandum No. 78, Series 2017. Policies, standards and guidelines for the bachelor of technology and livelihood education (BTLEd). <https://ched.gov.ph/wp-content/uploads/2017/11/CMO-No.-78-s.-2017.pdf>
- CHED Memorandum No. 79, Series 2017. Policies, standards and guidelines for the bachelor of technical – vocational teacher education(BTVEd). <https://ched.gov.ph/wp-content/uploads/2017/11/CMO-No.-79-s.-2017.pdf>
- Creswell, J. W. (2007). *Qualitative inquiry and research design*. Second Edition. California: Sage Publications.
- Corpuz, B. & Salandanan, G. (2007). *Principles of Teaching 1*. Lorimar Publishing, Inc. Quezon City, Philippines
- Department of Education. (2017, Aug 11). Department of Education Order No. 42, series of 2017. National Adoption of the Philippine Professional Standards for Teachers.
- Norcliffe, G. (2020). Technological change. *International Encyclopedia of Human Geography (Second Edition)* pp 187-192
- Popp, D., Newell, R. & Jaffe, A. (2010). Chapter 21 - Energy, the Environment, and Technological Change. *Handbook of the Economics of Innovation*. 2 (2010) 873-937
- Potts, J. (2014). Chapter 9 - New Technologies and Cultural Consumption. *Handbook of the Economics of Art and Culture*. 2 (2014) 215-231

Saldaña, J. (2009). *The Coding manual for qualitative researchers*. London: Sage Publications.

Siemens, G. (2005). Connectivism: A learning theory for the digital age. *International Journal of Instructional Technology & Distance Learning*, 2, 3-10.

Sun, L., Tang, Y. & Zuo, W. (2020) Coronavirus pushes education online. *Nature Materials*. Vol. p. 687. <https://doi.org/10.1038/s41563-020-0678-8>

Villena, D., Reyes, E. & Dizon, E. (2015). *Curriculum Development*. Adriana Publishing Co., Inc. Quezon City.

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