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Understanding the emergent attributes of 21st-century mathematics teachers in Bukidnon

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Abstract. Numerous quantitative research studies from abroad and in the Philippines had been investigating the attributes of the mathematics teachers in the 21st - Century. A study using grounded theory was designed to find out the attributes of 21st -century mathematics teachers in Bukidnon. Thirteen participants were interviewed over a period of four months. Interviews were analyzed using Pandit's grounded theory methodology and the constant comparison method. Three main categories and thirty-nine subcategories have been identified and explained that encompasses an emerging substantive theory of "Understanding the Emergent Attributes of 21st -Century Mathematics Teachers in Bukidnon" which are as follows: 1) Knowledge (community, curriculum, educational foundation and policies, environmental awareness, global awareness, pedagogy, students, subject content, self); 2) Skills (administrative and management skills, communication skills, facilitative skills, pedagogical skills, people management skills, reflective skills and thinking disposition, social and emotional intelligence and technological skills; and 3) Values (accurate, adaptive and resilient, aim for high standards, belief that all children can learn, collaborative learning and practice, commitment to nurturing the potential in each child, creative, empathy, enquiring nature, ethical, objective, passion, prayerful, perseverance, productive, professionalism, resourceful, social responsibility and engagement, stewardship, strive to improve, value parental involvement and valuing diversity). Further, the study revealed that the value of a person influences the teacher on what he will teach and directs the teacher on how he will teach the subject content.

Keywords. attributes of Mathematics teachers, understanding the Math teachers in Bukidnon, 21st – century Mathematics teachers in Bukidnon

1. Introduction

One of the most important social institutions is education. It is through education where we acquire more knowledge, right values, enhance skills, beliefs, and moral habits. It encourages quality learning all through life among individuals. According to Sadruddin (2013), each country requires the participation of teachers who will give the best type of training that must be provided to the students at every level. The quality of teachers has a bigger impact on the students' learning than the methods of teaching, the role of parents, the school building or the quality of the curriculum (Hattie, 2009). Thus, to have a quality education, the quality of teachers must be taken into consideration.

Teachers in the 21st -century has been provided with more opportunities in education. They are expected to maximize these opportunities for teaching and professional learning. The complexities of the work coupled with the demanding needs of the times have posed challenges to the teachers. These include teachers' minimum level of competencies in learning and innovation skills (critical thinking, creativity, collaboration, communication); information, media and technology skills (information literacy, media literacy, technology literacy); and life and career skills (flexibility, leadership, initiative, productivity and social skills).

With all changes in education, student qualities and educator attributes have changed. Teachers need to teach 21st - century abilities to their students for them to survive in the 21st - century. As indicated by Valtonen et al. (2017), it is essential for the teachers to be acquainted with the different pedagogical policies and suitable ways to utilize data and communication advances in supporting the improvement of their students' 21st - century abilities. As per Valli, Perkkilä and Valli (2014), teachers ought to have sufficient comprehension and usage of 21st

- century abilities. Teacher preparation assumes a significant part in the teaching of knowledge and capabilities which are needed for the teacher's acquirement of these abilities.

In the Philippines, there is a dearth on investigations about 21st-century mathematics teachers and students. Most of the studies conducted are in urban areas where advanced technology, sophisticated equipment and plenty of educational software are used in the classroom and where the majority of the students are well off and financially stable and whose parents can afford to spend for the education of their children. On the other hand, most students in the rural area are sons and daughters of farmers who work hard to earn for their living and could hardly spend for better education of their children. These students are not fortunate enough to be exposed to advanced technology and sophisticated equipment used by their teachers in the classroom. Whenever projects or assignments are given to them, their search for answers in order to solve the problem is very limited because most schools in rural areas do not have an internet connection. Internet connection in rural area is very different from that in the city. It varies from one place to another but there are common conditions like limited penetration of internet services, scarce choice of internet providers and old or even non-existent connectivity infrastructure.

In terms of teacher capabilities (training), there may be seminars, training, and workshops but the majority are conducted in the urban areas in the Philippines. They may be able to attend, but very seldom only. These known facts in the rural area do not give an excuse for the teachers to be equipped with the right skills to deliver Education 4.0. Teachers must bear in mind that the internet of things defines the future. As other countries, as well as ASEAN members, become more and more prepared for 21st - century skills, the Philippines is still trapped in the set of skills of the past. With innovative disruption, the workers of tomorrow are facing totally unknown territory known as the "fourth industrial revolution". The reality of today is such that systems, data and interconnection lead to the growth of e-Learning.

Despite all of these, some of the schools in the rural area are still performing in mathematics as evident in the Mathematics Teachers Association in the Philippines – Math Challenge. It is therefore interesting to study the scenario/case in a rural area. Although some characteristics of 21st-century teachers had been identified by Hafsah Jan (2017), this was done abroad and not in the Philippine setting. Furthermore, most of the studies conducted were quantitative studies wherein the characteristics of the 21st-century teachers were already identified, the model is already existing, and the participants of the study just have to fit with the existing model. This urges the researcher to gather data through systematic methodological

procedures and develop a theory on the attributes of the 21st-century teacher in a rural area specifically in the Philippines that is grounded in the data to be gathered.

2. Methodology

2.1 Procedures

The procedures that were employed in this study was guided by the methodology of grounded theory approach by Pandit (1996). Also, the techniques and analytic tools by Strauss and Corbin (2007) were used in the coding process and the constant comparison method by Glaser and Strauss (1967).

The methodology of Pandits' (1996) grounded theory consists of five phases namely: "1) research design phase, 2) data collection phase, 3) data ordering phase, 4) data analysis phase and 5) literature comparison phase". Pandit stressed that these phases are not strictly sequential. Moreover, he also identified nine steps or procedures inherent in the said phases.

2.2 Qualitative Research Design

This exploration utilized the philosophy of grounded theory to develop and investigate the data. Grounded Theory was supported by Glaser and Strauss because of the overemphasis in principle testing. It is a technique for getting theory from data that are efficiently gathered and broke down through the rationale of the examination cycle

2.3 Research Setting

The research study was conducted at the secondary schools in the third district in the province of Bukidnon.

The schools were chosen dependent on the over-all ranking from grade seven to grade ten and from school year 2016 to 2019 on the secondary district level performance in the Metrobank MTAP - Math Challenge.

2.4 Participants of the Study

The participants of this investigation were the secondary mathematics instructors in the government funded schools of the third District of Bukidnon who fit the description. All the participants that were engaged with this qualitative methodology were chosen due to the common qualities that they share (Creswell, 2013).

2.5 Data Analysis Procedure

In the analysis of data, the software maxQDA was utilized. This software serves to give insights into qualitative data sets without recommending translations. This software device for qualitative data and text analysis consider simple arranging, organizing, and breaking down a lot of text or other data and ease the administration of the subsequent interpretations and assessments.

For the coding cycle, open coding, axial coding, and selective coding was utilized in the analysis of the data.

3. Results and Discussion

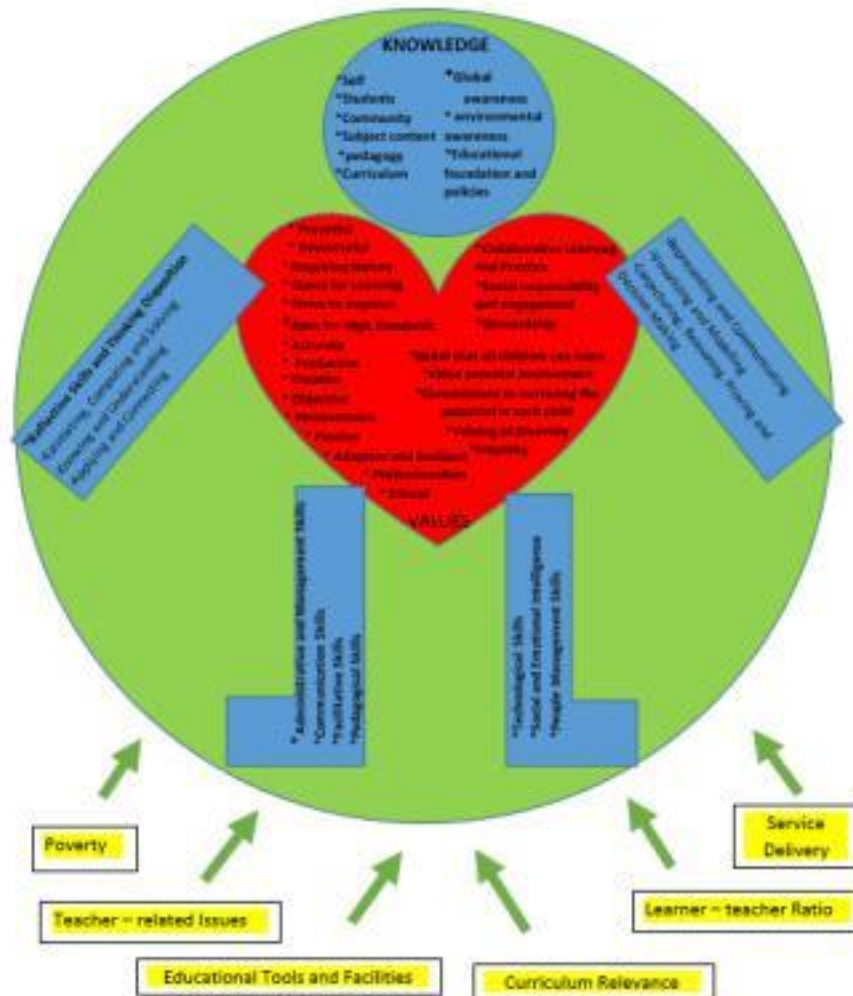


Figure 1. Framework on the Attributes of the 21st - Century Mathematics Teacher in Bukidnon

“Attributes of the 21st - Century Mathematics Teacher in Bukidnon” is a theory that has emerged.

Education and the difficulties in the preparation and training to have quality teachers are significant in numerous nations. To be successful, which is the aim of Philippine education depends upon the nature of the teachers. The traditional role of the educator being the center of student learning isn't adequate to address these difficulties. Rapid advancements in education have raised issues on the attributes which support the readiness and opportunities of teachers in professional development. Distinguishing the attributes most particularly the traits that would make one effective, give teachers new to the field, and those assigned to prepare them, with clear objectives and understanding on the teacher's role. This highlights a combined approach that seeks to develop the association between knowledge, skills and values. Accordingly, this framework exemplifies and seeks to teach the associations of the attributes (knowledge, skills and values) of effective teachers of the 21st - century in Bukidnon.

Base on the analysis, the participant is knowledgeable on the following: self, learner, community, subject content, pedagogy, educational foundation and policies, curriculum, global awareness and environmental awareness.

Knowledge. At the point when the student graduated teacher education, the preparation will be set in uncommon, physical, social and impermanent condition, showing the association of different, and related settings. The present circumstance will require the new educator to call upon different procedures of knowing to start to set up her capacities in the teaching profession. Thus, the teachers must be knowledgeable on the following community, curriculum, educational foundation and policies, environmental awareness, global awareness, pedagogy, students, subject content, and self.

Values. Malinda, Mwanja & Maithya (2017) alluded to that the individuals who are concerned in teacher training should consider values as a priority on their plan, and that values ought to advocate educator training. Base on few literary works, little thought has been given to contemplating how students and teachers may think about their own and professional values (Mabaso, 2017). To be suitable, certain convictions and mentalities are essential for teachers. They coordinate respect for all students and their individual encounters, trust in their capacities to learn, change one's own practices and quest for new answers or responds in due order regarding the issues experienced.

Ultimately, the educator should have the following values:

a. "Learner-centeredness puts the student at the core of teachers' work and the educator should be knowledgeable about student improvement and student diversity, accept that the students can learn, care for the student, acknowledge how student can learn best, and sort out some way to design the best learning environment (Lim, 2013). Learner – centeredness includes the following values which are as follows: belief that all students can learn, commitment to nurturing the potential in every child, valuing of diversity, and empathy.

b. Service to the teaching profession and to the community cores around teachers' commitment to developing beginning teachers in the profession through dynamic joint efforts and striving to turn out to be better experts so as to benefit the teachers in general" (Lim, 2013). Service to the profession and community value that includes collaborative learning and practice, social responsibility and engagement and stewardship.

c. Building up a strong sensation of educator character implies keeping up the best expectations in teaching and being a teacher and having a strong drive to learn considering quick changes in the training milieu and to being receptive to students' necessities (Lim, 2013). Teacher -identity value that encompasses: aims for high standards, enquiring nature, quest for learning, strive to improve, passion, adaptive and resilient, professionalism, and ethical.

Skills (S). In the field of instruction, "skills" implies accomplishments, so in order to obtain skills, it needs more practice through training. Skills support the student learning and classroom management (Mabaso, 2017.) As stated by Darling-Hammond, Wise, and Klein (1995), a teacher training that is amazing envisions that teachers ought to combine different sorts of knowledge and skills as they are utilized to determine the relationship among speculations and practice. Results of the study revealed that teachers were furnished with the following skills: reflective skills and thinking disposition, pedagogical skills, communication skills, facilitative skills, technological skills, people management skills and self-management skills.

A teacher is regarded as equipped if he can make decisions, considering the acquired knowledge, skills and values (Cribb and Gewirtz, 2001). Teachers attributes is important to the mission of being student-centered in the 21st - century classroom. Thus, the development of

gifted teachers who can respond sensibly to students' needs can empower students to be fruitful at considerably challenging goals. These objectives ought to include assisting students to be analytical and critical thinkers, make, and manage complex issues, as opposed to simply performing usual tasks.

The education in the 21st - century prepares the students for the challenges they face in the future (Saavedra and Opfer, 2013). Students must be equipped with new skills, the 21st - century skills, for economic and social obligation in this technological age. This is in light of the fact that the world economies are getting flatter, with a more conspicuous push for globalization than at some other time. The essential resource required for employability is knowledge, as typical work is logically set up through computerization. With the ultimate objective for students to effectively investigate this new and constantly advancing world, they need 21st - century skills, as for instance, technological skills, critical thinking skills, cooperative skills and basic reasoning skills. There is a general agreement that the use of technology is very important in the transformation of education, especially regarding the teaching of 21st - century skills (Botha and Herselman, 2015; Saavedra and Opfer, 2013; Dede, 2010). Technology enables students to team up, to make and to reflect about their own work. The technology supported creation, communication and collaboration effort is essential for mastering 21st - century skills. In any case, technology alone isn't enough, and the designs of the classroom as well as teaching practices must all together be introduced to successfully teach 21st - century skills (Saavedra and Opfer, 2013).

There are always issues in every setting of the study. These issues were made mention and were experienced by the teacher-participant in Bukidnon.

1. Poverty. Senate Majority Leader Juan Miguel "Migz" Zubiri mentioned during the Bukidnon Anti-Poverty Summit (BAPS) 2019 that according to the latest result of Poverty Incidence Survey of the Philippine Statistics Authority (PSA), Bukidnon fall on the 19th place on the list of poorest provinces in the whole country. Thus, Bukidnon is challenged to untap the potentials of the persons who influenced the youth just like the teachers. As it is known time and again that education is the key to success. This implies that it is education that opens the doors to many opportunities in life to all people from all backgrounds—just as the key does. That is why it is better to make education more accessible to the people and bring the schools and skills training centers closer to them. The higher the level of education that individuals had attained, the more unlikely it is that they are to be considered poor.

2. Tools and Facilities in Education. Though teachers are exposed to ICT, what they know are just the basics. As revealed from the interviews, only very few knows mathematics applications that could be used inside the classroom. In addition, numerous rural schools have practically little or zero access to ICTs for education management of school purposes (Hlalele, 2014a; Dlodlo, 2010). The internet connectivity is so weak and is very poor. Indeed, even in situations where minimized and country schools have gotten admittance to ICTs through contributor organizations, this has not settled all the issues as similar schools presently battle with incorporating the ICTs into their educational practices (Dzansi and Amedzo, 2014; Chingona, Chingona, Kayongo, and Kausa, 2010; Mathevula and Uwizeyimana, 2014). Given that ICTs that are incorporated into academic practices are fundamental for 21st - century learning, numerous students are not privileged to get that sort of education. Special educational facilities (for example labs, PC rooms, and so on) are either lacking or dysfunctional in most of the rural schools (Maringe et al., 2015). In addition, some do not have enough buildings to accommodate all the students (Hlalele, 2014b). In this manner, teacher needs strong knowledge on pedagogy so that even if they are not so much technologically inclined or not incorporating technology in their classes, they will be able to use varied methods and strategies to attract the

students so that they will not get bored. In addition, teachers need to be adaptive and resilient. They must adapt to their environment, do something on it and be resilient on the changes. Above all, teachers must be passionate. Despite the circumstances, the teacher will always do her part for the good of the students.

3. **Teacher related issues.** Hlalele (2014b) noticed the difficulties that rural schools face with respect to the qualification of the teachers, their motivation, their training and their morale. Great instructors might be reluctant to move to rural areas because of the difficulties of commuting, living or teaching in that community. Great teachers might be reluctant to stay for some time at the school because of the poor conditions and need of better ones. As indicated by Maringe et al. (2015), students in rural and poor schools are the ones who endure the most (scholastically) because of teacher related issues. Teachers must therefore be committed to the teaching profession and must be passionate to her profession. That is, despite the condition of the place and against all odds, their calling which is to teach the students must prevail.

4. **Learner-teacher ratios.** Rural schools usually have high learner-teacher ratios, where one teacher needs to teach many students all at once. This could be on the grounds that there aren't sufficient classrooms, which implies students must be consolidated into fewer classes. In either case, the educator can't give adequate attention to every student to guarantee that they have grasped the lessons (Maringe et al., 2015; Hlalele, 2014b). In this case, the teachers must value diversity among students, must be adaptive and resilient, must be aware of the pedagogy of teaching and must have the pedagogical skills in order to be an effective classroom teacher in dealing with various students with varied personality.

5. **Service Delivery.** Poor service delivery is an issue that numerous rural schools experience. Nelson Mandela Foundation (2005) states that students in many rural areas need to walk long distances each day so as to arrive at school. Sometimes road structures like bridges and road drainage systems are missing, making it hard for the students to get to the schools. These scenario affects much the performance of the students in the school. Teachers must therefore have the skill in communicating with the students oftentimes to know their background and on what they have been through. In addition, the teachers must be knowledgeable about their students' lives and must be aware of what is happening in the surroundings to have a deeper knowledge on what is their students are going through or what the students are experiencing from time to time. In addition, the teacher must have strong social and emotional intelligence in order to understand and address the situation instead of giving-up and losing hope.

6. **Curriculum relevance.** Students at rural schools subsequently need to learn educational plans that may not really be significant or relevant to their immediate context. Maringe et al. (2015) state in their paper that the 'expansive brush' strategy approach neglects to recognize the remarkable difficulties that rural schools experience. Lack of relevance of the educational plans could well be a noticeable issue, as Hlalele (2014b) states that students in rural schools are confronted with the "competing priorities between getting to instruction and home tasks".

4. Implications and recommendations

4.1 The Implication

The students we find in the classroom today are advanced; they have grown up with advancement around them (Prensky, 2010). Preparation of the students of the 21st-century for transformation to proficient life, social values and life itself is a complicated task. Globalization, innovation, international competition, relocation, changing business sectors and global

ecological and political changes add another desperation to the obtaining of the skills and knowledge required by students to be fruitful in the 21st - century (Saavedra and Opfer, 2012a). Howard Gardner expresses that students should now be outfitted with the knowledge and skills to do the works that is impossible by machines. Training students to be powerful in a 21st - century, information-based economy requires a substitute strategy of teaching.

Moreover, teachers are viewed as the most important factor on the quality of student achievement. In the McKinsey report "How the world's best-performing educational frameworks end up as the victor which is communicated evidently: 'The available proof suggests that the essential driver of the distinction in student learning at school is the quality of the teachers' (Barber and Mourshed 2007). Considering a tremendous scope review on factor influencing learning consequences of students, Hattie (2009) suggests that the quality of teachers generally influences the learning of students than the quality of the curriculum, the strategies for instructing, the school building or the guardians' job. Due to the comprehensively perceived importance of teachers, much consideration is given to plans concerning teacher quality. The European Council and the European Commission have appropriated procedure files and recommendations for quality improvement of teachers and their preparation and invigorate public governments to place assets into the improvement of the quality of teachers (Commission 2005, 2007; European Council 2007, 2009). The need to place assets into quality of teachers relies upon the challenges that public governments face regarding their education systems. Changes in society have incited to new challenges for schools.

Today, critical thinking, communication, participation, cooperation, basic reasoning, creative thinking, utilizing information and communication advances come to the fore as 21st skills to be obtained by students. To impart these skills to students, the teacher of the 21st - century ought to have the option to have skills and competencies, for example, educational skills, social and emotional skills, sympathy, administrative and management skills, effective communication, critical thinking, and numerous others. Teachers who train students of the 21st - century ought to have the option to apply 21st - century student skills in the in-class activities. Saavedra and Opfer (2012a) characterized the skills to be controlled by 21st - century teachers as making it pertinent, teaching through discipline, advancing reasoning skills, empowering the transmission of learning, teaching students how to learn, straightforwardly addressing miscommunications, treating collaboration as an outcome, utilizing advancements to strengthen learning and sustaining inventiveness. Teachers of the twenty-first century should help with preparing students later on to prosper in a fast-changing environment and should themselves benefit by the possibly broad ramifications for teaching and learning.

4.2 Implication of the Research Findings on Development of Theory

Despite similarities among the theory in the broad competencies they identify as important to success, there is considerable variation in the way different constituencies choose to represent them, and there is no single "best" theory that is applicable to all circumstances. It is important for a rural area not only to benefit from the insights of other jurisdictions but also to come up with its own theory and integrate the theory to schools' rules, policies, and guidelines in the curriculum in order to address the specific needs and goals of its educators and students.

Given the aspirations to raise quality of teachers and the desires for society towards educators that broaden the primary role of the teachers in term of teaching and learning, it is necessary to come up with a theory for teachers in Bukidnon that surpass the minimum standards. The presented frame of reference can contribute to develop, to assess and to strengthen the curriculum, improve the performance of educators, uplift the capabilities as far

as recruiting, promotion and retention of students to increase the level of students' performance. Most of the competences that are included in national teacher standards and in teacher education curricula focus on the micro- or classroom level, on the primary role of teaching and learning.

The curriculum of teacher education can inspire the components, for example by including students in innovations, by including exercises that engage students in various manners for public accountability, by stimulating exercises and activities which include stakeholders outside the school, and by modelling these characteristics by the teachers themselves.

This grounded theory research on “Attributes of the 21st - Century Mathematics Teacher in Bukidnon” is at stage of inception. Further research may be done on the emerging theory that will use participants in other places. The grounded theory of “Attributes of the 21st - Century Mathematics Teacher in Bukidnon” makes an impact at the very heart of any stakeholder or educational partner. The theory allows educational partners to view their work and their organizations not just a place of work but a way of life relative to being a teacher. It leads one toward a concrete path of realizing their institutions’ vision and mission, core values and identity that eventually applies the relevance of certain factor (knowledge, skills and values). Furthermore, decisions and policies can be formulated in general in connection with the “Attributes of the 21st - Century Mathematics Teacher in Bukidnon” as a way of providing the essential avenues for the teachers’ growth, effectiveness and efficiency. Findings from this study might have a big contribution to the growing body of work that could possibly suggest that one potential road to consider in preparing effective teachers may include assisting teachers with learning themselves and how their characters and conviction frameworks may add to their creating skills as teachers. Likewise, the results of this investigation can be utilized for the expert advancement of teachers, school change, improvement of the teaching and learning process, and improvement of the subjective well-being and scholastic accomplishment of students. Moreover, “the Theory on Attributes of the 21st-Century Mathematics Teacher in Bukidnon” can serve as a written testament of how it is to be an “educator”. It embraces and encompasses the field of one’s own profession, work or career in educational setting. But as of this moment, this theory cannot be more relevant or generalizable if not explored by further researches.

4.3 Implications for Practice

The government leaders should employ a holistic approach to help enhance the knowledge, skills and values of the teachers, thus, improving student achievement. This would imply efforts to improve the quality of education students receive as well as attending to the other needs of the children such as their physical, family, socio-emotional and spiritual needs.

Also, they might do well to review the educational practices and policies that have been institutionalized. Effort must be made to ensure that decisions made and procedures imposed would ultimately help improve the teaching-learning process and learning outcomes and not merely for monitoring purposes. Moreover, the model might be the basis in hiring, retention and promotion of teachers. It can also help them to plan activities, seminars, trainings and workshops in order to enhance the different skills and knowledge on different aspects of teaching since they are already aware on the attributes of the teachers in the 21st-century.

Moreover, the implications can be extended to the role of technology. The school must be equipped with sophisticated technologies so that the teachers will be trained on how to use it and apply it in her class. This is so important as of this time where flexible learning is encouraged because of the pandemic. Aside from this reason, it will help in the development of students’ technological skills and technology-enabled teaching and learning practices as it plays

a significant role in supporting the development of the full range of 21st - century competencies. The interviews reveal that schools don't have sophisticated technologies to be utilized in the classroom. Also, if there is an internet connection, it is very weak. The policy makers and administrators must consider this concern as this affects greatly the teaching and learning situation.

Changes in the demand for skills have significant implications for the capabilities which educators themselves need to get to effectively teach 21st - century aptitudes to their students. Today, where people can access content on the internet, when knowledge is being digitized and where employments are evolving quickly, instructors need to enable individuals to become lifelong learners, to oversee non-rule-based complex perspectives and complex methods of working that PCs can't take over. Educators are anticipated to embrace diversity with differentiated pedagogical practices. It is associated with being resourceful, about personalizing educational practices; and it is student focused, which implies that educational systems progressively need to recognize how people learn in different ways and foster new forms of educational provision that permit students to learn in the ways that are generally helpful for their advancement.

4.4 Recommendations

Based on the results and conclusion, the following are recommended:

Building partnerships. As indicated by Quismundo (2012), the Department of Education is at present seeking partnership with the private sector to address certain deficiencies in classroom, textbooks, instructors, school work areas and sanitation facilities. The effort can be systematized by conveying the advancement and coordination of the "adopt a school program" among private or non-government organizations to the non-public school's supervisor in every division.

Supporting Professional Development. Since teachers in Bukidnon have difficulty in commuting on areas where they could pursue higher degrees or attend seminars, trainings and workshops, it is recommended that the Department of Education will support the teacher's professional development through attendance in seminars, trainings and workshops. Professional development focusing on high-quality instruction, enhancing the knowledge of teachers, values and skills should be a continuing concern of educational leaders so as to guarantee good teaching.

Recommended components of the proposed professional development program includes:

a. **Mentor Program.** Educators who are the best in their field can be elevated to a "mentor" and would go around various schools to work with a specific subject instructor for a given timeframe, giving useful input, training, and classroom demonstration. Another choice would be to prepare school heads to fill in as mentors to their constituents instead of just evaluators of their presentation.

b. **In Service Trainings.** Exposing the teachers in Bukidnon to a modern and sophisticated schools with nice facilities/tools that has strong internet connectivity during in-service trainings would help expose them to what is recent and would help enhance their skills, values and knowledge. These encounters and concerns will likewise serve as a venue for collaboration, reinforcement, motivation and enhancement.

Pre-service training of the soon to be teachers will be in an urban area. Students are already exposed to the rural environment; it is ideal to expose them to a more advanced condition for them to have a better view of the school.

Empowering innovation. The variation of concepts brought into the K-12 educational plan as recently recommended ought to be modified according to the applicability of the topic in their locality and document the methods and innovative teaching strategies and materials used by the teachers in lieu of just replicating the prototype educational plan. Thus, this can be given points on promotion to serve as an inspiration/motivation for rural teachers to always innovate.

Aiming for internationalization. Incorporating a global standpoint into education has that great potential of generating internationally competitive learners even among rural learners. In fact, Knight (2003) thinks about the teachers as the drivers of internationalization.

Lastly, further qualitative research studies may be done using other methods depending on the purpose of the study. Also, further studies may be conducted to test the reliability of the result. Conducting similar research studies may be conducted on the applicability of the theory in the educational system as this would help in the process of selection, provide training, and require the professional development of new and experienced teachers.

Generally, the conclusion and recommendations mentioned above exudes teacher's knowledge, skills and values in order to help in the reduction of the gap between academic gurus, sociologists, policy-makers, scholars and practitioners for the improvement of the school system.

References

- [1] Barber, M. & Mourshed, M. (2007). *How the world's best-performing schools come out on top*. London: McKinsey.
- [2] Botha, A. & Herselman, M. (2015). A Teacher Tablet Toolkit to meet the challenges posed by 21st century rural teaching and learning environments. *South African Journal of Education*, 35(4):19.
- [3] Chingona, A., Chingona, W., Kayongo, P., & Kausa, M. (2010). An empirical survey on domestication of ICT in schools in disadvantaged communities in South Africa. *International Journal of Education and Development using Information and Communication Technology*, 6 (2), 21–32.
- [4] Christie P., Butler D., & Potterton, M. (2007). Report to the Minister of Education: Ministerial Committee on Schools that Work. Education Department, Republic of South Africa, Pretoria.
- [5] Corbin, J., & Strauss, A. (2007). *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory* (3rd ed.). *Thousand Oaks, CA: Sage*.
- [6] Creswell, J. W. (2013). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches* (3rd ed.). *Los Angeles, CA: Sage*
- [7] Cribb, A., & Gewirtz, S. (2001). Values in schooling. In J. Dillon, & M. Maguire (Eds.), *Becoming a teacher: issues in secondary teaching* Open University Press.
- [8] Darling-Hammond, L., Wise, A. E., & Klein, S. (1995). *A license to teach: Building a profession for 21st century schools*. Boulder, CO: Westview Press
- [8] Dede, C. (2010). Comparing Frameworks for 21st Century Skills. In J. Bellanca and R. Brandt (Eds.), *21st Century Skills: Rethinking how students learn*. Bloomington, IN: Solution Tree Press, pp. 51–76.
- [9] Dlodlo, N. (2010). Access to ICT education for girls and women in rural South Africa: A case study. *Council for Scientific and Industrial Research*, 21 (2), 12–56. Retrieved from <http://www.sciencedirect.com/science/article/pii/S0160791X09000268>

- [10] Dzansi, D. Y. & Amedzo, K. (2014). Integrating ICT into Rural South African Schools: Possible Solutions for Challenges. *International Journal of Education and Science*, 6 (2), 341–348.
- [11] European Council. (2007). Conclusions of the Council and of the Representatives of the Governments of the Member States, meeting within the Council of 15 November 2007, on improving the quality of teacher education. *Official Journal of the European Union* C300: 6-9.
- [12] European Council. (2009). Council Conclusions on the professional development of teachers and school leaders. *Official Journal of the European Union* C302: 6-9.
- [13] Glaser, B.G. & Strauss, A.L. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Chicago: Aldine Pub. Co
- [14] Hattie, J. A. C. (2009). *Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement*. London, UK: Routledge.
- [15] Hlalele, D. (2014a). Creating sustainable rural learning ecologies in South Africa: Realities , lessons and prospects. *Journal for Human Ecology*, 45 (2), 101–110.
- [16] Hlalele, D. (2014b). Rural education in South Africa: Concepts and practices. *Mediterranean Journal of Social Sciences*, 5 (4), 462–469. doi:10 . 5901 / mjss . 2014 . v5n4p462
- [17] Jan, H. (2017). Teacher of 21st Century: Characteristics and Development. *Research on Humanities and Social Sciences*. ISSN (Paper) 2224-5766 ISSN (Online) 2225-0484. Vol 7. No. 9.
- [18] Knight, J. (2003). Updated Definition of Internationalization. *International Higher Education*, (33). <https://doi.org/10.6017/ihe.2003.33.7391>
- [19] Knight, J. (2015). Updated Definition of Internationalization. *International Higher Education*, (33). <https://doi.org/10.6017/ihe.2003.33.7391>
- [20] Lim, K. M. (2013). *Teacher education in Singapore*. Paper presented at the SEAMEO RIHED Regional Seminar on Teacher Education, National Institute of Education, Singapore.
- [21] Mabaso, B. A. (2017). *Twenty-first century skills development in rural school learners* University of Cape Town.
- [22] Malinda, H., Mwanja, J., & Maithya, R. (2017). Strategies for fostering character development education by teachers in Kenyan schools. *African Education Research Journal*, 5(1), 64-74.
- [23] Mandela, Nelson.(2005). https://www.nelsonmandela.org/uploads/files/Annual_Report_2005.pdf
- [24] Maringe, F., Masinire, A., & Nkambule, T. (2015). Distinctive features of schools in multiple deprived communities in South Africa: Implications for policy and leadership. *Educational Management Administration & Leadership*, 43 (3), 363– 385. doi:10.1177/1741143215570303
- [25] Mathevu, Mlungisi & Uwizeyimana, Dominique. (2014). The Challenges Facing the Integration of ICT in Teaching and Learning Activities in South African Rural Secondary Pandit, N. R. (1996). *The Creation of Theory: A Recent Application of the Grounded Theory Method*. *The Qualitative Report*, 2(4), 1-15. Retrieved from <https://nsuworks.nova.edu/tqr/vol2/iss4/3>
- [26] Prensky, M. (2010) *Teaching Digital Natives. Partnering for real learning*. Thousand Oaks, CA: Corwin Publishers.
- [27] Quismundo, T. (2012). “Philippine education spending still below UN standard”. *Philippine Daily Inquirer* (issue date: 31 March 2012). Online available at

<http://globalnation.inquirer.net/31229/philippine-education-spendingstill-below-un-standard>

- [28] Saavedra, A. R., & Opfer, V. D. (2012). Learning 21st century skills requires 21st century teaching. *Phi Delta Kappan*, 94(2), 8-13.
- [29] Saavedra, A., & Opfer, D. (2012a). *Teaching and learning 21st century skills: lessons from the learning sciences*. New York: Asia Society.
- [30] Sadruddin, M.M. (2013). Are We Preparing Global Competent Teachers? Evaluation of the Incorporation of Global Education Perspective in Teacher Education Curriculum in Pakistan. *International Journal on New Trends in Education and Their Implications*, 4(1): 188-202.
- [31] Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed.). Sage Publications, Inc.
- [32] Timaeus, I., Simelane, S. & Letsoalo, T. (2013). Poverty, Race, and Children's Progress at School in South Africa. *Journal of Development Studies*. 49. 10.1080/00220388.2012.693168.
- [33] Valli, P., Perkkilä, P., & Valli, R. (2014). Adult pre-service teachers applying 21st century skills in th practice. *Athens Journal of Education*, 1 (2), 115-129. Retrieved from <http://www.atiner.gr/journals/education/2014-1-2-2-Valli.pdf>
- [34] Valtonen, T., Sointu, E., Kukkonen, J., Kontkanen, S., Lambert, M. C., & Mäkitalo-Siegl, K. (2017). TPACK updated to measure pre-service teachers' twenty-first century skills. *Australasian Journal of Educational Technology*, 33(3). <https://doi.org/10.14742/ajet.3518>