Teacher's technostress and transversal competencies towards adaptation of Education 5.0

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Abstract

This study focused on assessing and evaluating the influence of teacher's technostress and transversal competencies towards adaptation of Education 5.0 in Public Elementary School in the Seven (7) Schools Division in the Province of Laguna during the Second Semester of School Year 2023-2024. The subject-respondents of the study were the seven hundred (700) randomly selected classroom teachers from the thirty-five (35) public elementary schools in the Province of Laguna.

This study used an adapted and researcher-made questionnaires as instrument. Descriptive research method was used to determine the level of teacher's technostress and transversal competencies towards adaptation of Education 5.0 as well as the relationship among variables.

Based on the results of the study, it was found out that teachers obtained a high level of technostress indicating difficulty in coping up with the revolutionary changes brought about by technology. It substantiated different studies that stress on technology directly affects the wellbeing, performance and productivity of teachers. To mitigate the existing problem, reinforcement of technology adaptation is recommended through technostress inhibitors such as literacy facilitation, technical support provision and involvement facilitation.

The result obtained from the assessment on the level of transversal competencies perceived by teachers was verbally interpreted as "Highly Competent" which implies that teachers are equipped with essential skills to thrive in an ever-changing environment resulting from drastic technological advancements. Another important finding is the perceived level of adaptation to Education 5.0 wherein it obtained high mean which implies the readiness of teachers in embracing the new trend in Education which focuses on rehumanizing education despite the challenges encountered in dealing with technology. The study revealed a significant relationship between teacher's technostress and adaptation of Education 5.0 in terms of techno-overload showing a positive correlation, while in techno-insecurity it established a negative correlation with the adaptation of Education 5.0. The remaining techno stressors such as techno-complexity, techno-invasion and techno-uncertainty did not establish any correlation with the adaptation of Education 5.0. Significant relationship between Transversal Competencies and Adaptation of Education 5.0 was established which implies the key competencies required as connecting link in the realization of rehumanizing education. Intrapersonal skills and Global Citizenship emerged as predictors of the Adaptation to Education 5.0.

These findings provide valuable insights into the characteristics, experiences, and perceptions of public elementary school teachers in the Province of Laguna. The study emphasizes the importance of reducing the effect of technostress through literacy facilitation, technical support provision, and involvement facilitation to ensure the quality of teaching performance, productivity, and well-being of teachers. Further effort should be directed towards improving their technology adaptation to better facilitate learning and continue enhancing their transversal competencies to become more flexible, resilient and innovative which is geared towards the adaptation of Education 5.0.

Keywords: teacher's technostress, transversal competencies, Education 5.0, technology adaptation, public elementary schools

Introduction

The world in post-pandemic era is characterized by technology pushing towards rapid

transformation. The shift to digital environment has affected several aspects of our society, especially in the field of teaching and learning process. Education, being one of the most important facets in one's life, have been continually and tremendously evolving. Having said that, the advent of Education 5.0 requires schools and learning hubs to incorporate and integrate the adoptive use of modern industrial and technological revolution like artificial intelligence, robotics, machine learning and data analytics for providing an immersive and interactive learning environment.

Entering the 21st knowledge-based society, all nations around the world are promoting education reform initiatives through information communication technologies (ICTs). The United Nations (UN) announced the Sustainable Development Goals (SDGs) by 2030, which is a shared blueprint for all nations to achieve to improve health, education, climates, and other urgent issues through a global partnership. According to the SDGs agenda, education is viewed as the powerful strategy for addressing poverty and inequality in developing countries, calling for global attention and efforts to strengthen access to quality education (UNDP: United Nations Development Program, 2016).

In response to the 2030 agenda, the Philippines has enacted a law, Republic Act 10533, also known as the "Enhanced Basic Education Act of 2013." Which states to wit:

> "The State shall establish, maintain and support a complete, adequate, and integrated system of education relevant to the needs of the people, the country and society-at-large."

Moreover, with the legal mandate of promoting the right of all citizens to take appropriate steps in making education accessible to all, the Department of Education (DepEd) is geared towards the transformation of education through DepEd Computerization Program (DCP) as stated in the DepEd Order No. 78 s. 2010. DCP aims to provide public schools with appropriate technologies that would enhance the teaching-learning process and meet the challenges of the 21st century. This program shall respond to the computer backlog of public schools by providing them hardware and software, and training on simple trouble shooting. It will be the enabling mechanism to address the issues and concerns of teachers in keeping oneself updated to the fast emerging technology.

The effectiveness and efficiency of teachers in delivering the kind of education demanded by learners is directly linked to their competency. Investing in improving their competencies is linked to the effectiveness of teachers which is essential in an ever-changing environment. The holistic development calls for the transversal competence. The Philippines Basic Education Curriculum explicitly mentioned the transversal competency (TVC) through the statement:

> "Every graduate of basic education shall be an empowered individual who has learned, through a program that is rooted on sound educational principles and geared towards excellence, the foundations for learning throughout life, the competence to engage in work and be productive, the capability to engage in autonomous, creative, and critical thinking (Section 2, Republic Act 10533) as part of the goal of nurturing the 'holistically developed Filipino' (DepEd, 2016).

The given article clearly attests that the educational needs of all learners and society must be met and provided by the government. In doing so, teachers play a vital role in accomplishing the task. This is part of the goal of nurturing the "holistically developed Filipino (DepEd 2016)." In addition, Asia-Pacific Education Research Institutes Network (ERI-Net) identified the term transversal competency reflected in the Four Pillars of Education- one of the frameworks of K to 12 curricula.

Another important legal basis under Section 5 of Article XIV of the Philippine Constitution that is geared towards the development of teachers states that:

"The State shall enhance the right of teachers to professional advancement."

Pursuant to DepEd Order No. 001 s.2020 titled Guidelines for NEAP Recognition of Professional Development Programs and Courses for Teachers and School Leaders, the Department of Education through

NEAP issues the DepEd Professional Development Priorities for Teachers and School Leaders for SY 2020-2023.

The Professional Development Priorities shall support the realization of the Department's goal of continuous upskilling and reskilling of teachers and school leaders that will result in better learning outcomes. Teachers as facilitators and movers in the educational process are expected to perform excellently to fill the learning gaps and enhance the potentials of learners.

Despite the efforts exerted by the Department of Education, there is still a pressing need to address challenges related to technostress. Issues such as fear in using technology, lack of resources and inadequate support systems can significantly influence their well-being, performance and effectiveness. Therefore, conducting research, focused on exploring and addressing these challenges holds significant implications for teachers, learners and the overall education system.

Background of the Study

The evolution of technology is continuous that greatly affects the educational system of the Philippines. Due to the high demand of digital transformation, educators experience technostress which is the inability to cope with new technology that triggers anxiety and tensions affecting their job performance, job satisfaction and well-being. It denotes a negative effect on teachers' psychological and behavioral aspects.

The advent of COVID-19 pandemic has paved the way for teachers to experience the overwhelming demand on the use of technology for learning continuity. The researcher as the School ICT Coordinator for Programs and Projects had a firsthand experience of difficulty in coping with the demands of technology during that period due to information overload, technological skills to be learned and other technical issues. Fear, anxiety and confusion emerged to be felt by teachers especially the seasoned ones who struggled a lot in dealing with the abrupt change in modalities and strategies employed in teaching. It resulted to reluctance in embracing the use of technology due to fear leading to technostress.

Since the technology and academic institutions have been running in parallel for transformation of the education. Development of modern tools and techniques are also being updated in parallel for the better education standards. Education 5.0 is the next gen in precedence of the previous four versions (Mustafa Kamal et al., 2019).

As stated by Joo et al. (2016), expectation regarding the effective use of ICTs in the education and training process of today's teachers and the increasing pressures in this direction lead to the unwillingness of teachers with insufficient knowledge and skills to integrate the technology and may also cause stress deriving from technology, i.e. technostress of the teacher.

Moreover, the Education 2030 agenda emphasizes that teachers should be able to facilitate student learning by integrating technology with appropriate teaching methods and curriculum content. Many developing countries, however, are struggling to improve educational systems, particularly in educational reform initiatives related to technology- mediated learning (Malik, 2018).

The stress encountered by teachers in connection with the use of technology negatively affects their work performance, productivity and well-being. To address this problem, it is important to assess the transversal competencies of teachers which have become more important in the hyper-connected "knowledge society", driven by globalization, digital technology and extremely competitive economic forces.

While there are many opportunities arising from the use of digital technologies, there is a big risk to have unprepared citizens for the future. In order to realize the potential of digital technologies, teachers should be capacitated with essential competencies that will help to easily adapt to ever-changing environment.

The force of great transformations within the field of education is undeniable**.** It entails reduced interactions among human due to enabling technology. With this challenge, there is a need to bring humans back at the center of the educational process that will lead to the adaptation of Education 5.0. It is about time to rehumanize education to bring back the control to human. Hence, soft skills should be harnessed to make the

transfer of learning more relevant to oneself and society.

With the abovementioned discussion, the study aimed to assess the level of technostress and transversal competencies among teachers in the Province of Laguna in relation to the adaptation of Education 5.0. The findings of this study will provide valuable insights to school leaders for planning teacher development programs including in-service trainings.

Scope and Limitations of the Study

This study aimed to assess and evaluate teacher's technostress and transversal competencies towards adaptation of Education 5.0 among public elementary school teachers from the seven (7) schools divisions in the Province of Laguna for the School Year 2023-2024. Technostress involves techno-overload, techno-complexity, techno- insecurity, techno-invasion, and techno- uncertainty. On the other hand, the transversal competencies of teachers assessed the following: critical and innovative thinking, interpersonal skills, intrapersonal skills, global citizenship, and media and information literacy. Moreover, the adaptation of Education 5.0 was assessed based on the following: putting human qualities at the center of education, consideration for learners as agents of change, safety and ergonomics at school, and preparing learners for holistic, transformational and lifelong learning.

The study was conducted in the Province of Laguna composing of seven schools' divisions namely SDO Laguna, SDO San Pablo, SDO Calamba, SDO, Sta. Rosa, SDO Biñan, SDO San Pedro and SDO Cabuyao. The time frame for data collection and analysis was limited to School Year 2023-2024.

The respondents of the study were seven hundred (700) Public Elementary School Teachers from the seven (7) schools division of Laguna, five schools with twenty respondents in every school per schools' division. Clustering was utilized to determine the respective numbers of respondents.

The general objectives of the study were to assess and evaluate the influence of teacher's technostress and transversal competencies towards adaptation of Education 5.0. Through understanding the given aspects, the study aimed to provide insights and recommendations for improving the competencies needed by teachers to adapt to the rapid changes in education.

The study utilized descriptive research design and the respondents were chosen through random sampling. The quantitative data gathered from the responses of the participants were tabulated and analyzed to arrive at general findings, conclusions, and recommendations about the research conducted.

To gather reliable data in the conduct of the study, the researcher used adapted survey questionnaire checklist in the first part to assess the level of teacher's technostress from the study of Brooks and Califf (2020) entitled, "An Empirical Study of Techno-stressors, Literacy Facilitation, Burn-out, and Turnover intention as experienced by K-12 Teachers."

To determine the level of transversal competencies among teachers, the researcher crafted a survey questionnaire-checklist based on the definitions published by UNESCO of the following: critical and innovative thinking, interpersonal skills, intrapersonal skills, global citizenship, and media and information literacy. The survey questionnaire underwent face and content validation by the experts and was tested for its reliability.

Lastly, to determine the level of adaptation to Education 5.0 among teachers, the researcher created a survey questionnaire- checklist based on different published materials and frameworks with regards to the following attributes: putting human qualities at the center of education, consideration for learners as agents of change, safety and ergonomics at school, and preparing learners for holistic transformational and lifelong learning. The survey questionnaire underwent face and content validation by the experts and reliability testing.

The researcher decided to conduct this study to convey new and in-depth understanding, awareness and discernment on the role of technostress and transversal competencies towards the adaptation of Education 5.0.

Statement of the Problem

The study aimed to assess and evaluate Teacher's Technostress and Transversal Competencies towards adaptation of Education 5.0 of randomly selected public elementary school teachers from SDO Biñan, SDO Calamba, SDO Cabuyao, SDO Laguna, SDO San Pablo, SDO San Pedro, and SDO Santa Rosa for School Year 2023-2024.

Specifically it intended to answer the following questions:

1. What is the level of teacher's technostress in terms of:
   - 1.1 techno-overload;
   - 1.2 techno-complexity;
   - 1.3 techno-insecurity;
   - 1.4 techno-invasion; and
   - 1.5 techno-uncertainty?

2. What is the level of teacher's transversal competencies in terms of the following domains:
   - 2.1 critical and innovative thinking;
   - 2.2 interpersonal skills;
   - 2.3 intrapersonal skills;
   - 2.4 global citizenship; and
   - 2.5 media and information literacy?

3. What is the level of teacher's adaptation to Education 5.0 with regard to the following attributes:
   - 3.1 putting human qualities at the center of education;
   - 3.2 consideration for learners as agents of change; safety and ergonomics at school; and
   - 3.3 preparing learners for holistic, transformational and lifelong learning?

4. How does the teacher's technostress relate to the adaptation of Education 5.0?

5. How do the teacher's transversal competencies relate to the adaptation of Education 5.0?

6. Which among the variables in transversal competencies predict the adaptation of Education 5.0?

7. Based on the results of analysis, what model or framework can be developed?

Hypothesis

Based on the presented problems, the study tested the following null hypotheses:

1. There is no significant relationship between teacher's technostress and the adaptation of Education 5.0.
2. There is no significant relationship between teacher's transversal competencies and the adaptation of Education 5.0.
3. The variables of transversal competencies do not predict the adaptation of Education 5.0.

Theoretical Framework

The study is anchored on three theories namely; Person-Environment Fit Theory, Connectivism Theory and Humanistic Learning Theory that serve as bases on the development of the research study.

The Person-environment fit theory by Edwards et al. (1998) focuses on the interaction between characteristics of the individual and the environment. It argues that stress can arise due to a lack of fit between the individual's skills, resources and abilities, and the demands of the work environment, on the other hand. The P-E Fit theory makes explicit the interaction between the individual and the environment in shaping their response to work situations and events, but also highlights the importance of the individual's perception of the environment; and the interaction between them. Thus, technostress is conceptualized as a misfit between a person and the environment. It is not only limited by technology itself but also by the organization that has established the requirements for its use, and the member of the organization that on multiple occasions have an influence on the individual's use of technology (Avanzi et.al., 2018)

The P-E Fit theory is relevant in this study as basis in considering the sources and management of stress in order to bridge the gap of misfit in terms of individual's skills, resources and abilities and the demands of the work environment.

Another relevant educational learning theory is Connectivism which is grounded in the notion that learning is through the formation of connections between each other as well as their roles, hobbies, and other aspects of life. Therefore, learning is the ability to traverse and construct these networks. Connectivism builds on the ideas of cognitivism, but in this theory, learning does not reside only within an individual, but rather also within and across a network of individuals. A "community of practice" has connectivism as its theoretical underpinning. Knowledge can reside outside the individual but learning focuses on organizing and locating specialized information that may be decentralized from an individual (Goldie, 2016).

According to Fairbanks (2021), informed by the digital age, connectivism departs from constructivism by identifying and remediating gaps in knowledge. Strongly influenced by technology, connectivism focuses on learner's ability to frequently source and update accurate information. Knowing how and where to find the best information is as important as the information itself.

Moreover, this study is anchored on Humanistic Learning Theory by Mukhalalati and Taylor (2019) which emphasizes the freedom and autonomy of learners. It connects the ability to learn with the fulfillment of other needs (building on Maslow's hierarchy) and the perceived utility of the knowledge by the learner. Individuals function under needs that begin from those basic physiological needs of survival and culminate at self-actualization, which rests at the pinnacle of this hierarchy. All humans strive for self-actualization, which refers to a state wherein one feels that all their emotional, physical, and cognitive needs have been fulfilled.

The overwhelming effect of technology in this digital era allows educators to contemplate on how to put again the leaners at the center of the educative process.

This study is also anchored on pragmatism which is an educational philosophy focusing on the knowledge that is essentially related to human practice. According to John Dewey, pragmatism teaches that which is useful- what works in a practical situation – is true; what does not work is false. This thought applies to what is expected to teachers, teaching them the concept of technology and its application to teaching and other aspects of life which could possibly hinder technostress. Moreover, progressivism is another educational philosophy that is grounded in this study because it focuses on the individuality, progress, and change which are fundamental to one's education.

Conceptual Framework

Based on the theories presented, a conceptual framework was formulated. The conceptual framework as on the next page illustrates the three main variables of the study namely teacher's technostress, transversal competencies, and the adaptation of Education 5.0. Since the study focuses on the correlational analysis of the variables, the presentation in the diagram shows its interconnectedness.

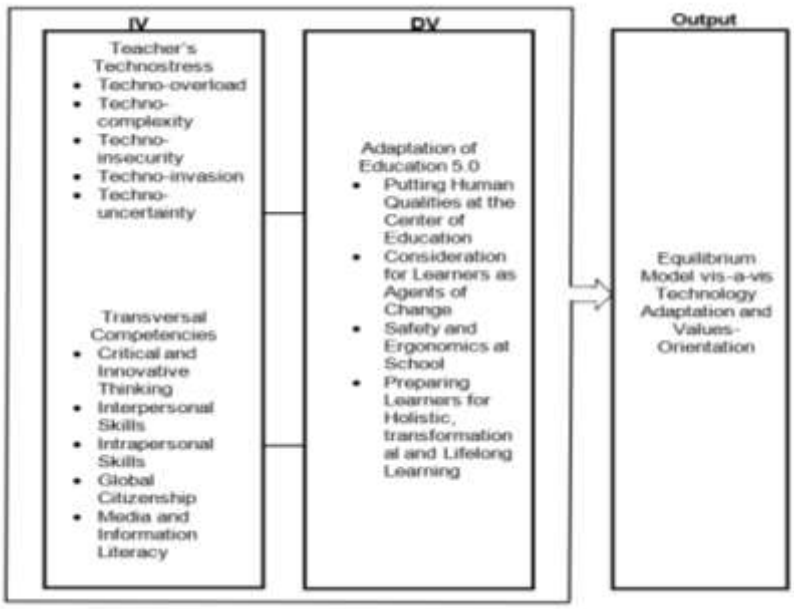


Figure 1
Conceptual Framework Showing Teacher's Technostress and Transversal Competencies
Towards Adaptation of Education 5.0

The figure illustrates three frames indicating the variables of the study. The first frame presents the independent variables namely of teacher's technostress and transversal competencies. The firs independent variable is Teacher's Technostress in terms of techno-overload, techno-complexity, techno-insecurity, techno-invasion and techno-uncertainty. The second independent variable is Teacher's Transversal Competencies in terms of Critical and Innovative Thinking, Interpersonal Skills, Intrapersonal Skills, Global Citizenship, and Media and Information Literacy.

The second frame presents the dependent variable which is the Adaptation of Education 5.0 with regard to following attributes such as Putting human qualities at the center of education; Consideration for learner as agents of change; Safety and ergonomics at school; and Preparing learners for holistic, transformational and lifelong learning.

Significant elements are added in the framework like lines and arrow which are strategically positioned depicting the connections of the variables. The independent variables such as Teacher's Technostress and Transversal Competencies are connected with an arrow pointing to the Adaptation of Education 5.0 as the dependent variable of the study which is indicative of their interrelationship.

Lastly, the arrow pointing to the last frame indicates the output of the study that was designed based on the findings of the study entitled "Equilibrium Model vis-à-vis Technology Adaptation and Values Orientation."

Review of Related Literature and Studies

This chapter presents the various literatures and studies of both foreign and local settings. These readings have been found to be pertinent in the study being investigated.

Variables

The following are the variables that are found to have bearing on the conduct of the study such as Technostress, Techno-overload, Techno-complexity, Techno-insecurity, Techno-invasion and Techno-uncertainty, Transversal Competencies, Critical and Innovative Thinking, Interpersonal Skills, Intrapersonal Skills, Media and Information Literacy, Global Citizenship, Adaptation to Education 5.0, Putting Human Qualities at the Center of Education, Consideration for Learners as Agents of Change, Safety and Ergonomics, and Preparing Learners for Holistic, Transformational, and Lifelong Learning.

Literature

The following are the variables of the study with reviewed literature both from foreign and local sources.

Teacher's Technostress

According to Penado et al. (2021) one of the negative observable outcomes of the adaption of technological instructional delivery alternatives amid the current situation is the technostress. This stress drives technology spillover effects into the lives of the teachers especially in developing countries where education is generally shaped by relatively slow technological transformation. Technostress can be described as the direct or indirect negative disturbance on the thoughts.

Çoklar et al. (2017) define technostress as pressure brought on by the use of technology and the skills and knowledge necessary to integrate technology effectively in one's teaching practice, which can generate stress.

Techno-overload

According to Pflügner et al., (2021) techno-overload refers to the feeling that people must work harder and faster than usual while handling technological activities from different emerging tools.

Besides workload, over the last years, a new demand related to the use of technology is emerging in several organizational context: this is generally referred to as techno-overload. In fact, technology in organizations can be both a positive instrument to better manage the working processes and work-life balance and a challenge because when demanding and stressful it can negatively impact workers' health (Sandoval-Reyes et al., 2019).

According Tarafdar et al. (2014), techno-overload refers to the situations which compel employees to work faster and longer.

Techno-complexity

According to Brooks and Califf (2020) when technology is too complex to carry out a task, or too complex to incorporate into a lesson plan, a teacher may experience the techno-stressor called techno-complexity. Such techno-complexity is therefore associated with a misfit in terms of a teacher's ability to use technology to carry out the task at hand. This misfit is then linked to strain.

Techno-complexity means employees cannot manage the complexity of the new technology. They feel a lack of computer skills that force them to spend more time learning and understanding new technology (Tarafdar et al., 2014).

Techno-insecurity

Techno-insecurity refers to individuals' persistent concerns of job loss at the hands of innovative technologies such as being replaced by technology or someone with stronger technological skills (Brooks and Califf, 2020)

Techno-insecurity is related to behaviors that are not conducive to a collaborative workplace, such as withholding knowledge from colleagues. These feelings are particularly important for the context of teaching, given that teaching is a highly collaborative profession, and students, as well as fellow teachers, benefit when teachers share information (Banerjee et al., 2017). Teachers who experience techno-insecurity, therefore, may in turn compromise student outcomes and contribute to a more negative, and less collaborative and open, workplace environment.

Techno-invasion

According to Tarafdar et al. (2019) common attributes of techno-invasion include users feeling constant connectivity to work, the need to sacrifice personal time for technology-related upskilling, a lack of time for family commitments, and concerns about surveillance and monitoring linked to a violation of personal privacy.

Techno-invasion is also related to the feeling that technology is interfering with one's personal life and family time. This corroborates findings that suggest, in general, teachers exhibit many challenges that contribute to a lack of work-life balance (Johari et al. 2018).

Techno-uncertainty

According to Brooks and Califf (2020) techno-uncertainty occurs when users feel pressured to constantly learn about new technologies to prevent their knowledge and experience from becoming obsolete. While users may initially feel motivated to do so, the permanent effort to refresh their skills can arouse negative emotions.

Techno-uncertainty refers to discomfort concerning the use of ICTs at work, and researchers identified its influence on worker strain and fatigue. Apprehension, anxiety, and agitation are common behavioral strains attributable to technostress, and one marker of techno-uncertainty, in particular, is fear of losing information from clicking incorrect keys or generally making mistakes (Joo et al., 2016).

Transversal Competencies

Transversal competencies are generally considered as skills of the 21st century and are connected with the human ability to solve problems related to technological advances and intercultural communication, generate new ideas and possible solutions and improvise, interact effectively, be able to teamwork, leadership, reveal emotional intelligence, sociability, collegiality, empathy etc. Interpersonal and intrapersonal skills are considered especially important because of the many roles that a teacher can play (Tkachenko, N. 2023)

According to Belchior-Rocha et al. (2022) transversal competencies are transferable and reusable skills that can be applied in a wide variety of situations and work settings, making them essential for success in the 21st century.

Transversal skills or transversal competencies are defined as a general terminology that groups the skills, which are highly valued globally. This notion was retrieved from the conclusion of the various approaches from different country in the Asia-Pacific region identified by United Nations Educational, Scientific and Cultural Organization (UNESCO) and reported by the Australian Council for Educational Research (ACER) headed by Esther Care with United Nations Children's Fund Philippines (UNICEF) as part

of the project of the Department of Education (2019).

According to Ercikan and Oliveri (2016), transversal competency refers to the combination of skills which the learners should possess to cope up in modern society and workforce. It includes critical and innovative thinking, interpersonal skills, intrapersonal skills, global citizenship and media and literacy (Hidalgo, et al., 2014).

Critical and Innovative Thinking

According to Wang and Jia (2023), critical thinking has become one of the qualities advocated in the 21st century and almost all countries now strongly support the cultivation of innovative talents with introspective and creative thinking abilities. However, it is challenging to develop people's critical thinking abilities since it involves a range of educational reforms and joint efforts by both learners and the overall social context. This problem is more obvious in countries which are liable to exam-oriented educational systems.

According to Tkachenko (2023) critical thinking is important for a teacher in organizing of the educational process. It helps to solve several important tasks: the selection of the content of educational material, the choice of forms and methods of organizing students' cognitive activity in the context of their personality development.

Interpersonal Skills

Mensah and Koomson (2020) asserted that learners who identify their educators as more helpful have academic achievement. They argued that teachers should be involved in communication with their learners in order to foster language learners' capabilities. They also mentioned that "whereas a positive teacher-student interpersonal relationship creates an enabling environment for academic engagement and achievement, the lack of it stifles the level of academic engagement and achievement to some extent. Students require some sense of belonging to enhance their academic work".

Interpersonal skills are the qualities and behaviors teacher uses to interact with colleagues and students effectively while performing their job. It includes but not limited to effective communication, listening, positive attitude and deportment (Akindele-Oscar et al., 2019).

Intrapersonal Skills

Gravells (2017) relates intrapersonal skill with reflection and accessing the inner feelings in his definition. He believes that people learn from the past, thus reflection helps people to identify behavior they need to modify, develop strength and reduce limitation, so as people might become closer to achievement

According to Vijayalakshmi (2016), people with higher intrapersonal skill are able to manage oneself from within because emotional turmoil is sometimes delivered through facial expression and the message sent outside through internal feeling is somehow observed and interpreted by someone else, even though it was not intended to be delivered.

Global Citizenship

In the conditions of globalization and growing interconnections and interdependencies, there is a need to develop and spread a general ideology that would emphasize that, first of all, a person is a member of a global community of people, and not a separate nation. Education with goals of global citizenship aims to development students' specific skills, knowledge and values, which will help to become conscious, responsible and active members of the world community (Tkachenko et al., 2023)

Global Citizenship as a concept is enjoying some currency in the public and academic domains. The

theory and study of GC has been a growth industry especially in philosophy, international relations, and education, and it has been adopted as a central educational reform under the Sustainable Development Goals and endorsed by major international organizations, think tanks, and the expanded regime of Global Education Policy (Mundy et al., 2016).

Media and Information Literacy

Contemporary understanding of media and information literacy in the global context is based on the presupposition that its basic and major function is to provide access to information and knowledge and promote free, independent and pluralistic mediated social environments: "Media and information literacy recognizes the primary role of information and media in our everyday lives. It lies at the core of freedom of expression and information - since it empowers citizens to understand the functions of media and other information providers, to critically evaluate their content, and to make informed decisions as users and producer of information and media content" (UNESCO, 2020).

The rapid development of information and communications technology has brought about a number of issues regarding the way people become aware of, perceive, and reconceptualize information, which very often takes on the form of a manifestly manipulative narrative that can produce misleading discourses. When people misunderstand or have a distorted idea of reality and are unable to assess objectively what is going on in society and certain forces are artificially creating conflict and stressful situations, this may give rise to the threat of reality getting dehumanized. Accordingly, in today's climate of information overload, there appears to be a need to cultivate and develop the cognitive skills of analytical, critical, and systems thinking and foster the skills of media hygiene" (Lebid & Shevchenko, 2020).

Adaptation of Education 5.0

Education 5.0 according to Derjoveda (2021) starts with humans, not technology. The academe revolution aims to underpin the achievement of humans as an outcome of a particular learning experience. This education era is not about providing every learner with gadgets, or even improving infrastructure and connectivity, but it is about preparing them to be globally competitive and holistically equipped considering intellectual, social and emotional factors. More so, this era aims as well to develop strong individuals and be mindful of their health and personal development.

Education 5.0 is highly innovative method, which can develop the teaching staff, students, administration to the next level of technology adoption in learning environment. Learning process is established by the learner and driven and controlled by the learner (Mara, 2019) . As such, the learner is seen as a whole person of whose values, beliefs, thoughts, knowledge and skills are not seen as separate fundamentals to be nurtured and trained. Dynamic technology surrounds the learner and provides options for the learner’s core decisions of what, where, when, how, why and with whom to study (Melluso et al., 2020) .

Consideration for Learners as Agents of Change

According to Asari (2020), when learners use complex, class discussion and assignments to deepen their understanding of how change occurs, they become better equipped to cultivate their own civic engagement. This prompt them to drive their own learning and grasp ways to effect change. To be effective agents of change, learners need to know how to reason and argue their position, write and speak in a thoughtful and compelling way, and listen to others. The learners roles in the change involves participation in the implementation process also by participating in the teaching and learning process, being disciplined and obedient in class can also portray a positive feedback about the change process.

The function of an agent of social change that is attached to the identity of students at this time should

not be limited to slogans, but a reconstructive and solutive thought to problems surrounding education in this nation that students can contribute to related parties, and exercise control over government policies (Yuliani and Hartanto, 2016). Especially considering that students are currently critical and creative in conveying and actualizing themselves through social media.

Safety and Ergonomics at School

According to Ryabova et al. (2020) educational ergonomics is simply creating an environment safe and healthy for individuals for their secured life in later years.

Zunjic (2017) describes the term ergonomics as a multidisciplinary science, which deals with the workplace, process of work, and aims to improve comfort, safety and efficiency of people considering physiology, psychology, sociology and organizational aspects of humans.

Zunjic, et al. (2015) explain that school ergonomics encompasses almost every single element of school including school building, classroom environment, students' sitting position, exercises they perform, teaching procedure, sports activities and classroom activities all are part of school ergonomics.

Preparing Learners for Holistic, Transformational and Lifelong Learning

Lifelong learning is multi-faceted, shaped by decades of international policy debates and agendas (Atchoarena & Howells, 2021). It refers to "the way one's learning pathway is built through life, articulating the learning process to different life contexts. The interaction between education and its application in real-life situations gives a sense of purpose to lifelong learning"

The challenge on lifelong learning is apparent in SDG4 which aspires to promote inclusive and equitable quality education and lifelong learning opportunities for all, yet in the targets and indicators of this Goal, the emphasis is on formal education (Carr et al., 2018).

Burchi and Rippin (2015) claim that, 'there is nothing specific about access to knowledge beyond schooling' in the SDGs, and thus lifelong learning is often conceptualized and operationalized as formal learning.

Studies

The following are the variables of the study with reviewed studies both foreign and local.

Teacher's Technostress

The findings of Khlaif et al. (2023), states that technology characteristics, including the complexity and the benefits of a given technology, and privacy concerns play a crucial role in teachers' experiences of technostress. Moreover, they found that colleague support in using new technology and open educational resources each contributed to mitigating teachers' technostress levels. Their study extends technostress research to examine a new learning environment and context. This focus allowed them to highlight the need to develop open educational resources and better social support structures for teachers and to rethink the professional identities of developing teachers to mitigate their levels of technostress.

Technostress is not a simple health issue of the employees or teachers, rather it is an issue for the management of the universities and the educational institutions. Studies have shown that by controlling the factors affecting techno stress, the side effects of techno stress can be reduced and minimized, helping the people perform better at their jobs (Li and Wang, 2020).

Techno-overload

When organizations promote innovation through new technologies to strengthen competitiveness, they suffer innovation resistance due to work overload, invasion of privacy, and uncertainty in predicting work. Organizations should develop devices to mitigate the detrimental effects of introducing new technologies to manage these innovation resistances (Kim and Lee 2021).

In addition, Balmores (2021) nationwide survey points to burnout and low work-life quality among teachers, attributing these issues to extended work hours, heavy workload, and insufficient government support. Urgent intervention programs and support from the Department of Education are deemed necessary.

Techno-complexity

The result of the study conducted by Khlaif, Z.N. et al. (2023) entitled Factors Influencing Teacher's Technostress Experienced in Using Emerging Technology: A Qualitative Study, divulged that complexity of using new technology was considered source of technostress as reported by 48 of the teacher-respondents. The teachers confirmed that it requires effort and time to learn about complex technology and how to use it in teaching.

According to Brooks and Califf (2020), when technology is too complex to carry out a task, or too complex to incorporate into a lesson plan, a teacher may experience the techno-stressor called techno-complexity. Such techno-complexity is therefore associated with a misfit in terms of a teacher's ability to use technology to carry out the task at hand. This misfit is then linked to strain.

Techno-insecurity

Techno-insecurity has a negative effect on innovation resistance, which means that that the higher the techno-insecurity, the lower the resistance behavior by trying to adapt to the current situation. In addition, the influence of techno-uncertainty on innovation resistance is quite strong, which means that changes caused by the introduction of new technologies arouse strong innovation resistance (Kim & Lee, 2021).

According to the study of Brooks and Califf (2020), teachers who experience techno-insecurity, therefore, may in turn compromise student outcomes and contribute to a more negative, and less collaborative and open, workplace environment.

Techno-invasion

Techno-invasion, yet another of the dimensions of technostress, appeared in this study and it was associated with more burnout, strain, and less work engagement. The researchers describe technical invasion as the loss of privacy in one's personal life due to information and communication technology. When technology makes workers reachable at any time, with no boundaries between work and personal time, individuals report considerable work–family conflicts (Gabr et al., 2021)

The results of the study conducted by Brooks and Califf (2020) entitled "An empirical study of techno-stressors, literacy facilitation, burnout, and turnover intention as experienced by K-12 teachers" revealed that K-12 teachers exhibit high levels of techno-invasion, meaning that they perceive the technology they are using for work as contributing to a blurring of work and home life, and that this feeling is related to burnout.

Techno-uncertainty

The result of the study conducted by Kim and Lee (2021) entitled Exploring the Roles of Self-Efficacy and Technical Support in the Relationship between Techno-Stress and Counter-Productivity, reveals that the influence of techno-uncertainty on innovation resistance is quite strong, which means that changes caused by

the introduction of new technologies arouse strong innovation resistance.

The result of the study conducted by Nicholson et al. (2015) reveals that techno-uncertainty and techno-complexity were not significantly related to burnout. This may be because these two techno-stressors are characteristically related to a chaotic and complex environment. K to 12 teaching is often referred to "uncertain work." Therefore K-12 teachers are argued to be highly acclimated to working in a complex and uncertain environment. In this sense, K-12 teachers are likely well-versed in coping with uncertain and complex work environments and may not associate such technological uncertainty and complexity with burnout.

Transversal Competencies

The result of the study conducted by Aquino, F. (2023) entitled "Transversal Competencies of Values Education Teachers: Pathways to Education 5.0" revealed that teachers are highly equipped with transversal competencies that can be used for the new normal system of education as prescribed by the DepEd basic Education Learning Continuity Plan.

Despite the importance of transversal competencies, there are limited researches conducted in the Philippines. Of the few conducted, Care (2019) analyzed the Philippine K to 12 curriculum and found challenges in the definitional, operational and systemic matter which hinders the study and implementation of transversal competency.

In the regional study on transversal competencies in education policy and practice carried out by the leadership of UNESCO transversal competencies are defined as ones to include six domains: critical and innovative thinking, interpersonal skills, intrapersonal skills, global citizenship, media and information literacy, and others. The domain 'others' was created as a way for researchers to include competencies, such as physical health or religious values, that may not fall into one of the other (UNESCO, 2016).

The result of the study conducted by Collie and Martin (2016) implies that teachers possess transferrable skills that are relevant in the teaching and learning. Adaptability is highly relevant to teachers given that "teaching work involves responding to and managing constant change."

It is in equal importance to the findings of Claudiu (2015) showing that transversal skills are useful to each instructor in developing personal projects relating to their professional training and personal performance self- assessment. Moreover, Transversal skills are recognized as essential skills of the teachers in the organization and growth of the teaching and learning process and their teaching of these skills to their students (Čepić et al., 2015).

Critical and Innovative Thinking

According to study conducted by Wang and Jia (2023), with the advancement of society, teachers should keep pace with the times. In this process, teachers who lack critical thinking ability can only repeat fixed knowledge which is not conducive to their own as well as students' academic development. So, it can be concluded that teachers' critical thinking is very crucial in education. It should also be acknowledged that the cultivation of critical thinking does involve both students and teachers and therefore the two connect with each other.

Teachers play a vital role in nurturing independent learning. They guide and organize independent work, enhance critical thinking, and tailor content to meet individual needs. Studies in the Philippines, such as Gepila (2020), underscore the importance of teachers' competence, particularly in managing learners' diversity. Continuous professional development is recommended to address this need.

Moreover, Molina (2018) study in Mindanao revealed strengths in creating a positive learning environment but weaknesses in promoting critical thinking and collaborative skills. This emphasizes the necessity for teachers to cultivate an environment conducive to independent thought and collaboration among

students.

Interpersonal Skills

The study of Ansari et al. (2020) revealed that educators with positive relationships with learners have learners with moderately academic success in educational contexts. They also found that teacher-learner negative interpersonal relationship leads to underachievement, and inconsistency in teacher-learner interpersonal relationship is not constantly correlated with learners' academic performance. They argued that teacher immediacy enhances learner involvement, which has positive results for attention and doing educational tasks.

In the study conducted by Koula (2015), good interpersonal relationships contribute to the school's effectiveness by creating a healthy, friendly school climate and a learning environment that allows the students to develop their personality comprehensively. However, the employee's background and work environment can, in some way, affect interpersonal relationships in the workplace unless properly managed (Patricia, 2015).

Intrapersonal Skills

The result of study conducted by Ehondor (2017), states that the building of a personal brand begins with looking inward (intrapersonal communication), and, when done correctly, the potential for achieving desired success is more significant. These primary findings are consistent with research showing that the Intrapersonal aspect significantly affected personal goals expected to reflect one's climate. It has a positive effect on choice for permanent employment and the intention to contribute to the territory's development.

Intrapersonal skills can help individuals solve problems involving feelings, controlling anger or selfishness and how to manage them with courtesy. Intrapersonal skills also enable individuals to develop high self-esteem, even to train leadership, communication, and the ability to motivate others (Aristigueta and Denhardt, 2015). Teachers should be able to manage emotions and feelings as it might affect their relationship with not only students, also with the administration and people around them.

Global Citizenship

According to Grobbauer and Wintersteiner (2019), we have shown that contemporary education means education to become a global citizen, which is why education in global citizenship must become the norm for all education. The previous study of (Global Alliance for Monitoring Learning, 2017) states SDG Target 4.7 by 2030, ensure that all learners obtain the knowledge and skills needed to encourage sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and culture's contribution to sustainable development.

Additionally, Jones (2016) in his research revealed that the implementation of GCEA was mild and a large number of teachers (over 60%) did not fully conceptualize the Global Education Agenda for Citizenship. This is in consonance with the findings of Aquino (2023) which implies that EP teachers care a lot for the environment and exercising the Maka-Kalikasan core values of DepEd. However, teachers must attend webinars on conflict management to attain the objective of Global Citizenship and to be more productive in their workplace.

Media and Information Literacy

Media and digital literacy programs also have issues, such as the lack of comprehensive assessment data on media literacy initiatives. Initiatives may have little to no effect on specific products or even create harmful overconfidence conditions (Bulger and Davison, 2018). This implies that teachers are responsible for

using Digital Media to know the possible legal action on this but need to undergo trainings regarding digital citizenship to prevent from misinformation, leading to fake news dissemination.

Despite some national peculiarities or cultural differences there are still some common global problem zones in the current media literacy education: "In accordance with UNESCO recommendations, it is necessary: to develop comprehensive programs for media education at all educational levels; training teachers in the field of media education and increasing awareness of media literacy of all stakeholders and organizations in the social sphere; conducting research in the field of media education and the wide dissemination of their results; international cooperation in the field of media education; and most importantly - the wide practical implementation of media education of the population at various levels" (Fedorov, 2018).

Adaptation of Education 5.0

Diestro D. (2022) in his study entitled “Learning Readiness in Education 5.0 as Influenced by Value Creation and Academic Productivity”, recommended that teachers may enhance the collaborative-based measurement of learning tasks to fully equip the student’s potential. Moreover, they are also encouraged to develop a well-structured learning pathway and learning materials where students could take ideas on how to further advance their skills. In terms of learning readiness in this education 5.0 era, it is recommended that active participation in seminars, workshops, and fora presenting trends and global competitiveness are encouraged to provide a breakthrough among the learners and teachers to enhance their knowhow of the relevant and responsive competencies.

Recently, a study was conducted to explore the learner’s perception towards the modern methods of learning like Education 5.0 in the state university of Zimbabwe. Study showed that the overall education sector has many deficiencies to cater the market needs and align the education sector with the market demands. In this regards, Education 5.0 was recommended at state higher education to bridge the gap between the country’s market needs and the academic knowledge provided at universities. Focus was to transform the traditional education system to learning based academic environment aligned with the market needs as Education 5.0 is more towards developing the research oriented educational environment. It also provides the social services and brings innovational integration between the education sector and industries (Rumbidzai et al., 2020).

Putting Human Qualities at the Center of Education

Learning Experiences were more of student-centered than teacher-centered. The results of the investigations into the common learning experiences encountered by students during curriculum implementation indicated that the experiences in theoretical subject contents was predominantly student-centered (69%) and in practical teaching and practicum attachment the tendency was at 59%. These tendencies provided learning experiences during curriculum implementation. The results of the study also indicated that various educational practices were applied during the implementation of the curriculum. The implementation process included providing flexible learning opportunities for trainees during individual projects and in all areas where student-centered approaches were applied and is the current norm in Uganda as per the recent strategy to promote the science subjects, Vocationalization policy strengthening (Adupa et al., 2022).

Sulkifli (2021) in his study entitled “The Importance of Understanding Student Character to Support Successful Learning in Junior High School” concluded that teacher's understanding of student characteristics makes it easier for teachers to carry out the learning process; this can be because teachers can provide things that are by student needs and remain based on learning objectives.

Consideration for Learners as Agents of Change

According to Allen (2023) that in terms of how students found the experience of being engaged as a

partner in the design of a module, 87% reported it as positive and 13% reported it as neutral. Many who found it a positive experience said something along the lines of "it is nice to have an input," and it was clearly appreciated that this input was sought before, rather than after, the fact. As noted by one respondent "it gives students the chance to be heard and make a difference at the start of the module so that we get to experience what we have suggested**.**

Based on the result of the study conducted by Adupa et al. (2022) entitled "Students as Agents of Change in Curriculum Designing and Implementation: Involvement and Participation Drives", they come up with the recommendation that listening and learning from student voices necessitated a shift from the ways in which teachers engaged with students and how they perceived their own practices. When the voice of students is heard, it will open up space for effective dialogue and participation in the decision-making process hence facilitate effective curriculum design and implementation process.

Safety and Ergonomics at School

The result of the study conducted by Jabeen and Hassain (2022) indicated that ergonomics is highly valued in school education for students' safety and health. Teachers introduce appropriate physical exercise in the classroom to keep children healthy and active during school hours and provide postural awareness for developing proper body posture. Counselling parents on ergonomics risk factors was suggested, along with ergonomically designed furniture in the classroom and the use of light material backpacks are also recommended.

Furthermore, Ismail et al. (2020) emphasizes the influence of a healthy school environment on teaching, learning, and student behavior. Clean facilities and health-promoting initiatives positively impact engagement and academic performance. Involving teachers in planning and implementing health and environment programs, along with providing training and incentives, is recommended.

Preparing Learners for Holistic, Transformational, and Lifelong Learning

According to Ng (2023), there is a growing need to promote lifelong learning for K-12 education to prepare future generations for the complex and evolving world. Taking this into account, a key focus is to reform education in schools to support students in developing lifelong learning skills to stay resilient. This paper has highlighted that an emphasis on nurturing lifelong learning for K-12 education is essential for success in today's information and knowledge acquisition era.

Teachers in the classrooms are instrumental in student learning and positive outcomes; as such, the primary determining elements in class may foster or thwart the process of lifelong learning (Ng et al., 2015). A teacher's interaction with students in the classroom can be presented in a motivating approach to nurturing student curiosity and learning for life (Ng and Latife, 2022). Taken altogether, it is an invaluable endeavor to discuss lifelong learning for K-12 education and how it could translate to student motivation to learn and learn for life.

Reviews of education and research have consistently highlighted the importance of developing lifelong learning competencies and nurturing the ability to learn through life (Taranto and Buchanan, 2020). Evidence also suggests that schools should provide educational benefits and connections between learners and communities for meaningful education and lifelong learning (Wals and Benavot, 2017).

Methodology

This chapter presents the research design, setting of the study, subject of the study, procedure of the study, sources of data, construction of the instrument, validation of the instrument, administration of the instrument, data gathering procedure and statistical treatment of data.

Method of Research Used

In this study, a descriptive research method was used to gather detailed information about the current condition being examined. Descriptive research aims to provide a comprehensive description of the existing situation and explore the causes of prevailing conditions through practices and activity descriptions. Its primary goal is to collect data to test hypotheses and answer questions related to the subject of the study (Calmorin, 2016).

In addition, McCombes (2019) states that correlational research design measures a relationship between two variables without the researcher controlling either of them. It aims to find out whether there is either positive correlation, negative correlation, or zero correlation.

According to Allen (2017) Quantitative research is a way to learn about a particular group of people, known as a sample population. Using scientific inquiry, quantitative research relies on data that are observed or measured to examine questions about the sample population.

The chosen research method is particularly relevant as it focuses on assessing and evaluating the level of teacher's technostress and transversal competencies in relation to the adaptation of Education 5.0 of public elementary school teachers. By employing a descriptive research approach, the study aims to gain insights into the prevailing condition and provide a thorough analysis.

Setting of the Study

The study was conducted in selected public elementary schools from the seven (7) Schools Divisions in Laguna Province.

Laguna is a province in the Philippines situated in CALABARZON region in Luzon. Its capital is Santa Cruz while its largest city is the City of Calamba. It comprises twenty-four (24) municipalities and six (6) cities. In education sector, Laguna comprises seven (7) Schools Divisions namely SDO Laguna, SDO Calamba, SDO San Pablo, SDO Biñan, SDO Sta. Rosa, SDO San Pedro and SDO Cabuyao.

The schools divisions in the province of Laguna support the programs and projects of DepEd specifically the DepEd Computerization Program (DCP) which aims to improve the quality of education by providing public schools with appropriate technologies that would enhance the teaching-learning process and meet the challenges of the 21st century in terms of technological advancement and innovation. The conduct of professional development programs is also evident focusing on the enhancement of the needs of teachers which is very beneficial to the teaching and learning processes.

Moreover, the schools' divisions in the province of Laguna carry out deep commitment and dedication to the Vision and Mission of the Department of Education by ensuring that every learner has access to quality education.

Subject of the Study

The subject-respondents of the study were the 700 randomly selected classroom teachers from the thirty-five (35) public elementary schools in the province of Laguna.

Table 1
Distribution of the Teacher Respondents by Schools Division Offices

Schools Division Office	Name of School	No. of Respondents
SDO Biñan	Biñan Elementary School	20
	Canlalay Elementary School	20
	Malaban Elementary School	20
	Pagkakaisa Elementary School	20
	Platero Elementary School	20
SDO Cabuyao	Banay-Banay Elementary School	20
	Cabuyao Central School	20
	Niugan Elementary School	20
	Pulo Elementary School	20
	Sala Elementary School	20
SDO Calamba	Bucal Elementary School	20
	E. Barretto Sr. Elementary School	20
	Jose Rizal Memorial School	20
	Parian Elementary School	20
	Real Elementary School	20
SDO Laguna	Alaminos Elementary School	20
	Francisco Benitez Memorial School	20
	Mabitac Elementary School	20
	Paete Elementary School	20
	Victor O. De Guia Jr. Memorial Elementary School	20
SDO San Pablo	C.M. Azcarate Elementary School	20
	Prudencia D. Fule Memorial Elementary School	20
	San Jose Elementary School	20
	San Lucas II Elementary School	20
	San Roque Elementary School	20
SDO San Pedro	Chrysanthemum Village Elementary School	20
	Landayan Elementary School	20
	Langgam Elementary School	20
	Pacita 2 Complex Elementary School	20
	San Pedro Central Elementary School	20
SDO Santa Rosa	Balibago Elementary School	20
	Dila Elementary School	20
	Dita Elementary School	20
	Santa Rosa ES Central II	20
	Santa Rosa ES Central III	20
	Total	700

Procedure of the Study

The study followed standard procedure and took several measures to ensure its success. The first step which the researcher has undertaken was the conceptualization of the title which was followed by the title defense. After the approval of the title, conceptual framework was designed and sought for relevant theories in support of the study. By the time the variables were identified, development of Chapters 1, 2, and 3 was accomplished. Proposal defense was undertaken, the construction of a research instrument which comprised of an adapted and researcher-made questionnaire was accomplished and submitted for content validation by pool of experts in the field of study. The researcher sought permission from the foreign authors to adapt their questionnaire checklist. Electronic mail was sent and got the approval of the authors.

After the content validation of the questionnaire, pilot testing was administered and the result was submitted to the Statistical Center for reliability testing. While waiting for the result, the researcher submitted letter of request to conduct the study in the office of the seven schools division superintendents in the Province of Laguna, five (5) public schools district supervisors in the Schools Division of Laguna, and thirty-five (35) public elementary schools school heads in the Province of Laguna.

The researcher collected data through hard copy forms. The survey questionnaires were personally distributed to respective school heads. The retrieval of the survey questionnaires followed. The gathered data were then taken to the URS' Statistical Center for appropriate data treatment. Successively, the researcher concentrated on interpreting and analyzing the data, which led to the completion of the remaining chapters of the study, including the creation of the model and action plan as the output of the study. The researcher then formulated the findings, conclusions, and recommendations based on a careful interpretation and analysis of the data. A pre oral defense was held, where the researcher presented the study's results. After incorporating useful comments and suggestions from the panelists and the researcher's adviser, final oral defense was held. After the defense, the whole research was finalized, considering the feedback received and making sure that all necessary revisions were done accordingly. Extensive scrutiny of the manuscript was done by the editor and the final reading was done by the Dean of the Graduate School for the fine-tuning of the manuscript. The reproduction of the hardbound copies of the manuscript was done after receiving a go signal from the Dean of the Graduate School. Hardbound copies of the manuscript were submitted to the University Library and National Library.

Sources of Data

This study used a combination of an adapted and researcher-made questionnaire-checklist as instrument. The first part of the questionnaire-checklist was adapted and modified questionnaire from the study of Christopher B. Califf and Stoney Brooks, entitled "An empirical study of techno-stressors, literacy facilitation, burnout, and turnover intention as experienced by K-12 teachers" which asked the respondents about the level of technostress. The researcher sought permission from the foreign authors to adapt their questionnaire checklist. Electronic mails were sent for the approval of the authors.

The respondents were asked to rate the items as an assessment on the level of technostress.

Scale	Mean Range	Verbal Interpretation	Description
5	4.20-5.00	Always	The teacher agrees 80%-100% with the given statement about technostress (Very High)
4	3.40-4.19	Often	The teacher agrees 60%-79.99% with the given statement about technostress (High)
3	2.60-3.39	Sometimes	The teacher agrees 40%-59.99% with the given statement about technostress (Average)
2	1.80-2.59	Seldom	The teacher agrees 20%-39.99% with the given statement about technostress (Low)
1	1.00-1.79	Never	The teacher agrees 0%-19.99% with the given statement about technostress (Very Low)

Part II dealt with the level of the transversal competencies of teachers. The questionnaire-checklist was made using the definitions of each transversal competency published by UNESCO.

The respondents were asked to rate their assessment on the level of their transversal competencies.

Scale	Mean Range	Verbal Interpretation	Description
5	4.20-5.00	Very Highly Competent	The teacher demonstrates 80%-100% of the given statement about Transversal Competencies
4	3.40-4.19	Highly Competent	The teacher demonstrates 60%-79.99% of the given statement about Transversal Competencies
3	2.60-3.39	Competent	The teacher demonstrates 40%-59.99% of the given statement about Transversal Competencies
2	1.80-2.59	Less Competent	The teacher demonstrates 20%-39.99% of the given statement about Transversal Competencies
1	1.00-1.79	Least Competent	The teacher demonstrates 0%-19.99% of the given statement about Transversal Competencies

Part III was also a researcher-made questionnaire checklist taking into considerations articles, journals and studies related to the attributes of Adaptation to Education 5.0.

The respondents were asked to rate their practice on the Level of Adaptation to Education 5.0 using the scale below.

Scale	Mean Range	Verbal Interpretation	Description
5	4.20-5.00	Very High Observed	The teacher observes 80%-100% of the given statement on the level of adaptation to Education 5.0
4	3.40-4.19	Highly Observed	The teacher observes 60%-79.99% of the given statement on the level of adaptation to Education 5.0
3	2.60-3.39	Moderately Observed	The teacher observes 40%-59.99% of the given statement on the level of adaptation to Education 5.0
2	1.80-2.59	Rarely Observed	The teacher observes 20%-39.99% of the given statement on the level of adaptation to Education 5.0
1	1.00-1.79	Poorly Observed	The teacher observes 0%-19.99% of the given statement on the level of adaptation to Education 5.0

Sampling Design and Sample

This study used a cluster random sampling to cover the seven (7) Schools Division in the Province of Laguna with the same number of schools per division as well as same number of respondents per school. According to Simkus J. (2023), cluster random sampling is a probability sampling method where researchers divide a large population into smaller groups known as clusters, and then select randomly among the clusters to form a sample. Cluster sampling is used when the target population is too large or spread out, and studying each subject would be costly, time-consuming, and improbable. It allows researchers to create smaller, more manageable subsections of the population with similar characteristics. Cluster sampling is particularly useful in areas of geographical sampling when the populations are widely dispersed.

Construction of the Instrument

This study used an adapted and modified questionnaire for Part 1 from the study entitled “An Empirical Study of Techno-stressors, Literacy Facilitation, Burn-out, and Turnover intention as experienced by K-12 Teachers” and a researcher-made questionnaire was utilized for Part 2 and Part 3 to assess the level of the Transversal Competencies of teachers and their adaptation to Education 5.0.

Validation of the Instrument

The researcher used an adapted questionnaires and a researcher-made questionnaires for the study. The researcher asked permission from the foreign authors to adapt and modify the questionnaires via electronic mail. After the researcher was granted permission to adapt and modify the questionnaires, the researcher consulted pool of experts in the field to validate the content of the adapted and researcher-made questionnaires. The researcher attached the references used to serve as bases for the checking of content, adaptation, and modification in the validation process.

All inputs and suggestions of the expert validators were taken into consideration to finalize the research instrument. To test the reliability of the research instrument, pilot testing was administered to thirty (30) teachers as respondents to answer the questionnaires. The result of the pilot testing garnered a Highly Reliable results in all components of the instrument.

Administration of the Instrument

The instrument was administered by the researcher immediately after securing the approval of the permit to conduct the study from the respective school authorities. Hard copy of questionnaire-checklist was provided to all teacher-respondents to make sure that they find time to read and better understand the given items. Teacher-respondents from various elementary schools were provided with sufficient time to answer completely all the questionnaires.

Data Gathering Procedure

The researcher collected data through hard copy forms. The survey questionnaires were personally distributed to respective school heads. The retrieval of the survey questionnaires followed. The gathered data were then taken to the URS' Statistical Center for appropriate data treatment.

Statistical Treatment

For the analysis and interpretation of data, the following statistical tools were applied:

To determine the level of teacher's technostress in terms of techno-overload, techno-complexity, techno-insecurity, techno-invasion, and techno-uncertainty, mean was used.

To determine the level of transversal competencies of teachers in terms of critical and innovative thinking, interpersonal skills, intrapersonal skills, global citizenship and media and information literacy, mean was utilized.

To determine the level of adaptation to Education 5.0 with regards to putting human qualities at the center of education, consideration for learners as agents of change, safety and ergonomics at school, and preparing learners for holistic, transformational and life, mean was used.

To determine the significant relationship between teacher's technostress and adaptation of Education 5.0, Person r was utilized.

To determine the significant relationship between teacher's transversal competencies and adaptation of Education 5.0, Person r was used.

To determine which among the variables in transversal competencies predict the adaptation of Education 5.0, regression analysis was utilized.

To determine the suitable model to be developed based on the results of the study, a qualitative description was used.

Presentation, Analysis, and Interpretation of Data

This chapter deals with the presentation, analysis and interpretation of data based on the generated statistical results to answer the specific problems of the study comprehensively and substantially.

Level of Teacher's Technostress in Terms of Techno-Overload, Techno-Complexity, Techno-Insecurity, Techno-Invasion and Techno-Uncertainty

Table 2 presents the level of teacher's technostress in terms of techno-overload.

Table 2
Level of Teacher's Technostress in Terms of Techno-Overload

Techno-Overload I am forced by technology to…	Mean	VI
1. work faster.	4.25	Always
2. do more work than I can handle.	4.16	Often
3. work with very tight time schedules.	4.06	Often
4. change my work habits to adapt to new technologies.	4.21	Always
5. have a higher workload because of increased technology demand.	3.96	Often
Overall	**4.13**	Often

The result of the study indicates that the level of teacher's technostress in terms of techno-overload is high. This implies the negative perception and experience of teachers in dealing with technology. While technology can aid in multitasking and help users accomplish tasks faster, exceeding a person's "healthy" multitasking capabilities can lead to frustration and stress. Techno-overload also encompasses technology mediated interruptions which can put pressure on the user to attend to the incoming information immediately. In line with this, Galluch et al., (2015) further explained that technology mediated interruptions can distract the user from completing a work task, which in turn necessitates additional effort (more work) to return to the initial task.

Table 3 illustrates the level of teacher's technostress in terms of techno-complexity.

Table 3
Level of Technostress in Terms of Techno Complexity

Techno-Complexity I find it difficult to use technology for the reason that I…	Mean	VI
1. do not know enough about technology to handle my job satisfactorily.	3.13	Sometimes
2. need a long time to understand and use new technologies.	3.20	Sometimes
3. do not find enough time to study and upgrade my teaching skills.	3.14	Sometimes
4. often find it too complex to understand and use new technologies.	3.16	Sometimes
Overall	**3.16**	**Sometimes**

The result of the study indicates that the level of teacher's technostress in terms of techno-complexity is average. This suggests that despite being surrounded by different technological applications, teachers still find difficulty in utilizing and understanding technology. The lack of knowledge on technology hinders the opportunity to integrate technology in the lesson that could be more beneficial to learners. The indicative data is in parallel to the findings of Califf and Brooks (2020), which underscores that when technology is too complex to carry out a task, or too complex to incorporate into a lesson plan, a teacher may experience the techno-stressor called techno-complexity associated with misfit in terms of a teacher's ability to use technology to carry out the task at hand. This misfit is then linked to strain.

Table 4 shows the level of teacher's technostress in terms of techno-insecurity.

Table 4
Level of Technostress in terms of Techno-Insecurity

Techno-Insecurity	**Mean**	**VI**
I am techno-insecure as I…		
1. feel constant threat to my job security due to new technologies	2.99	Sometimes
2. get worried about technology use, due to the necessity to keep up with constantly developing technology.	3.10	Sometimes
3. give up on using technology, as I cannot find sufficient opportunities for technology education.	2.78	Sometimes
4. feel uncomfortable because I am not familiar with the terminology used in defining new technologies.	2.88	Sometimes
Overall	**2.94**	Sometimes

The result of the study indicates that the level of teacher's technostress in terms of techno-insecurity is average. This implies that teachers are experiencing techno-insecurity in an average level which means that despite the capacity trainings provided for them to be acquainted with technology, the pressure and fear remain to be felt. Teachers experience constant worrying, discomfort, and fear that results to reluctance of embracing new technology. Thus, the transfer of learning become limited which hinder the teachers to showcase their full potential in using technology.

A resemblance of this result is mirrored in the findings of Kim & Lee (2021), underscoring that techno-insecurity has a negative effect on innovation resistance, which means that that the higher the techno-insecurity, the lower the resistance behavior by trying to adapt to the current situation. In addition, the influence of techno-uncertainty on innovation resistance is quite strong, which means that changes caused by the introduction of new technologies arouse strong innovation resistance.

Table 5 presents the level of teacher's technostress in terms of techno-invasion.

Table 5
Level of Technostress in Terms of Techno-Invasion

Techno-Invasion	**Mean**	**VI**
I am techno-invaded in such a way that I have to…		
1. spend less time with my family due to technology.	3.36	Sometimes
2. be in touch with my work even during vacation due to technology.	3.68	Often

3. sacrifice my vacation and weekend time to keep abreast with new technologies.	3.38	Sometimes
Overall	**3.48**	**Often**

The result of the study indicates that the level of teacher's technostress in terms of techno-invasion is high. This denotes that constant connectivity such as being frequently exposed to technological devices interfere desired boundaries between work and personal life. It results from receiving work-related notifications even after work hours and feeling the need to respond immediately. This scenario results to negative attitude and perception of teachers on technology.

This is supported by Tarafdar et al. (2019) reiterating that invasion of non-work time and space can cause stress because users feel that they are never free from technology. Common attributes of techno-invasion include users feeling constant connectivity to work, the need to sacrifice personal time for technology-related upskilling, a lack of time for family commitments, and concerns about surveillance and monitoring linked to a violation of personal privacy.

Table 6 presents the level of teacher's technostress in terms of techno-uncertainty.

Table 6
Level of Teacher's Technostress in Terms of Techno-Uncertainty

Techno-Uncertainty	Mean	VI
I face technological uncertainty due to…		
1. constant worrying about infecting technologies with viruses.	3.47	Often
2. constant worrying on data storage in digital environments such as memory sticks, Internet, etc. Which can be lost, or change hands.	3.60	Often
3. excessive information like password, account name, etc., to remember for technological environments which I might forget.	3.69	Often
4. negative effects of technological devices within the classroom such as noise, heating, etc.	3.43	Often
5. security of technological devices like storing, keeping, etc. In school.	3.59	Often
6. health hazard of technology use that can cause health problems.	3.63	Often
Overall	**3.57**	**Often**

The result of the study indicates that the level of teacher's technostress in terms of techno-uncertainty is high. It implies that teachers have negative notion and experience on the constant change and upgrades in technology that results to innovation resistance affecting performance and productivity. They find difficulty in adapting to uncertainties in technology.

The result harmonizes with the findings of Kim and Lee (2021) entitled Exploring the Roles of Self-Efficacy and Technical Support in the Relationship between Techno-Stress and Counter-Productivity, which reveals that the influence of techno-uncertainty on innovation resistance is quite strong, which means that changes caused by the introduction of new technologies arouse strong innovation resistance.

Table 7 presents the composite table on the level of teacher's technostress in terms of techno-overload, techno-complexity, techno-insecurity, techno-invasion, and techno-uncertainty.

Table 7
Composite Table on the Level of Teacher's Technostress in Terms of Techno-overload, Techno-complexity, Techno-insecurity, Techno-invasion and Techno-uncertainty

Technostress	Mean	VI	Description
Techno-overload	4.13	Often	High
Techno-complexity	3.16	Sometimes	Average
Techno-insecurity	2.94	Sometimes	Average
Techno-invasion	3.48	Often	High
Techno-uncertainty	3.57	Often	High
Grand Mean	**3.45**	**Often**	**High**

The result of the study signifies that the level of teacher's technostress is high. Apparently, it can be implied that teachers are struggling to cope up with the use of technology resulting to a high level of technostress which affects their well-being, performance and productivity.

The result coincides with the findings of Li and Wang (2020) that technostress is not a simple health issue of the employees or teachers, rather it is an issue for the management of the universities and the educational institutions. Studies have shown that by controlling the factors affecting technostress, the side effects of technostress can be reduced and minimized, helping the people perform better at their jobs.

Level of Teacher's Transversal Competencies in Terms of Critical and Innovative Thinking, Interpersonal Skills, Intrapersonal Skills, Global Citizenship and Media and Information Technology

Table 8 exhibits the level of teacher's transversal competency in terms of Critical and Innovative Thinking.

Table 8
Level of Teacher's Transversal Competencies in Terms of Critical and Innovative Thinking

Critical and Innovative Thinking	Mean	VI
1. Use a wide range of creation techniques to craft new and worthwhile ideas as well as observable creations such as artworks and performances (Creativity).	3.91	Highly Competent
2. Be technical, innovative, and possess risk-taking skills necessary to turn ideas into action, as well as plan and manage projects in order to achieve objectives (Entrepreneurship).	3.88	Highly Competent
3. Act on creative ideas to make a tangible and useful contribution to the field in which the innovation will occur (Application Skills).	3.94	Highly Competent
4. Reflect critically on learning experiences and processes in order to inform future progress (Reflective Thinking).	3.93	Highly Competent
5. Use various types of reasoning as appropriate to the situation, to effectively analyze and evaluate evidence, arguments, claims and beliefs in making judgments and decisions (Reasoned Decision Making).	3.93	Highly Competent
Overall	**3.92**	**Highly Competent**

The result indicates that the level of teacher's transversal competencies in terms of Critical and Innovative Thinking is Highly Competent.

This implies that when it comes to Critical and Innovative Thinking, teachers can show their abilities to use knowledge, facts, and data to effectively solve problems as well as possessing careful understanding in

examining the meaning of things. Seemingly, respondents are highly equipped of being creative to use a wide range of creation techniques create new and worthwhile ideas as well as observable creations and skills necessary to elaborate, refine, analyze and evaluate their creations to improve and maximize creative efforts. However, they need to improve on entrepreneurship competency, the combination of technical, business management, personal determination, innovation, and risk-taking skills necessary to turn ideas into action and plan and manage projects to achieve objectives.

This is congruent to the findings of Wang and Jia (2023), that with the advancement of society, teachers should keep pace with the times. In this process, teachers who lack critical thinking ability can only repeat fixed knowledge which is not conducive to their own as well as students' academic development. So, it can be concluded that teachers' critical thinking is very crucial in education. It should also be acknowledged that the cultivation of critical thinking does involve both students and teachers and therefore the two connect with each other.

Table 9 shows the level of teacher's transversal competency in terms of interpersonal skills.

Table 9
Level of Teacher's Transversal Competency in Terms of Interpersonal Skills

Interpersonal Skills	Mean	VI
1. Articulate thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts (Communication Skills).	4.03	Highly Competent
2. Have the skills on general organizing, team administration, planning, time management, coordinating resources and meeting deadlines (Organizational Skills).	3.96	Highly Competent
3. Work with others towards a common goal (Teamwork).	4.18	Highly Competent
4. Work effectively and respectfully with diverse teams, including the skills necessary to exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal (Collaboration).	4.15	Highly Competent
Overall	**4.08**	**Highly Competent**

The result means that the level of teacher's transversal competency in terms of interpersonal skills is highly competent.

This implies that as social smart individuals, teachers are well-versed in interacting with others in the team but needs improvement when it comes to organizing and leading the group.

In summary, most of the respondents are highly equipped with Interpersonal Skills with an overall mean of 4.08 which is verbally interpreted as "Highly Competent". This is in consonance to the findings of Koula (2015), good interpersonal relationships contribute to the school's effectiveness by creating a healthy, friendly school climate and a learning environment that allows the students to develop their personality comprehensively. However, the employee's background and work environment can, in some way, affect interpersonal relationships in the workplace unless properly managed (Patricia, 2015).

Table 10 on the next page presents the level of teacher's transversal competency in terms of Intrapersonal Skills.

Table 10
Level of Teacher's Transversal Competency in terms of Intrapersonal Skills

Intrapersonal Skills	Mean	VI
1. Set goals with tangible and intangible success criteria, balance short and long-term goals, and manage one's workload efficiently (Self-discipline).	4.08	Highly Competent
2. Monitor, define, prioritize and complete tasks without direct oversight (Ability to learn independently).	4.08	Highly Competent
3. Adapt to varied roles, jobs responsibilities, schedules and contexts as well as the ability to work effectively in a climate of ambiguity and changing priorities (Flexibility and adaptability).	4.13	Highly Competent
4. Recognize and understand my personal strengths, weaknesses, behaviors, and development areas, in order to self-improve (Self-awareness).	4.13	Highly Competent
5. Be a self-directed learner who goes beyond basic mastery of skills and/or curriculum to explore and expand my own learning and opportunities to gain expertise.	4.08	Highly Competent
Overall	**4.10**	**Highly Competent**

The result reveals that teachers are highly competent in terms of their Intrapersonal Skills. This implies the proficiency of teachers of being self-smart despite adversities, noise, and confusion around them. The emotional intelligence of teachers has been formed to exude confidence in performing their duties and responsibilities. Knowing oneself is important to determine your goals, identify your strengths and weaknesses and understand your values and beliefs which shape your actions and decisions in life.

According to Aristigueta and Denhardt (2015), the aspects of self-management and self-awareness are among the key components of improving one's emotional intelligence. Lecturers should be aware of the disabilities that might hinder them away from the success. The acknowledgements of disabilities lead to asking for help, especially from colleagues. They also perceive that this action can enhance social skills among lecturers.

Table 11 exhibits the level of teacher's transversal competencies in terms of Global Citizenship.

Table 11
Level of Teacher's Transversal Competencies in Terms of Global Citizenship

Global Citizenship	Mean	VI
1. Understand, negotiate and balance diverse views and beliefs to reach workable solutions, particularly in multi-cultural environments (Respect for diversity).	4.13	Highly Competent
2. Respect cultural differences and work effectively with people from a range of cultural backgrounds and responding open-mindedly to different ideas and values (Intercultural understanding).	4.15	Highly Competent
3. Participate effectively in civic life through knowing how to stay informed and understanding governmental processes (Democratic participation).	4.10	Highly Competent
4. Identify areas of agreement and disagreement, reframe a problem, and analyze the issues and interests at stake that are necessary to manage and resolve conflicts (Conflict Resolution).	4.02	Highly Competent
5. Take individual and collective action towards addressing environmental challenges (Respect for the Environment).	4.13	Highly Competent
Overall	**4.10**	**Highly Competent**

The result signifies that teachers are highly competent in terms of global citizenship. The abovementioned results imply that teachers exhibit high level of awareness and understanding of the wider world. They take an active role in their respective communities by respecting the world's cultural diversity, taking responsibility and collaborating with others to promote peaceful, sustainable and fairer world.

This is supported by Grobbauer and Wintersteiner (2019), stating that we have shown that contemporary education means education to become a global citizen, which is why education in global citizenship must become the norm for all education. The previous study of (Global Alliance for Monitoring Learning, 2017) states SDG Target 4.7 by 2030, ensure that all learners obtain the knowledge and skills needed to encourage sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and culture's contribution to sustainable development.

Table 12 shows the level of teacher's transversal competency in terms of media and information literacy.

Table 12
Level of Teacher's Transversal Competencies in Terms of Media and Information Literacy

Media and Information Literacy	Mean	VI
1. Identify, locate and access appropriate information sources (including assembling knowledge and information in cyberspace), and interpret this information and draw conclusions based on analysis (Ability to obtain and analyze information through ICTs).	3.93	Highly Competent
2. Evaluate the quality, appropriateness and value of the information, as well as its sources (Ability to critically evaluate information and media content).	3.96	Highly Competent
3. Apply a fundamental understanding of the ethical/legal issues surrounding the access and use of information technologies (Ethical use of ICTs).	3.98	Highly Competent
Overall	**3.96**	**Highly Competent**

The result indicates that teachers are highly competent in Media and Information Literacy. This explains that teachers have become increasingly capable of scrutinizing the reliability of information from different sources and filter those to get at the truth to make informed judgments as user of information and media. Acquiring this skill also helps to become skillful creators and producers of information and media messages. Thus, it prevents us from falling into the trap of fake news that can distort the truth and create chaos.

Media and digital literacy programs also have issues, such as the lack of comprehensive assessment data on media literacy initiatives. Initiatives may have little to no effect on specific products or even create harmful overconfidence conditions (Bulger and Davison, 2018). This implies that teachers are responsible for using Digital Media to know the possible legal action on this but need to undergo trainings regarding digital citizenship to prevent from misinformation, leading to fake news dissemination.

Table 13 on the next page presents the composite table on the level of teacher's transversal competencies in terms of Critical and Innovative Thinking, Interpersonal Skills, Intrapersonal Skills, Global Citizenship and Media and Information Literacy.

Table 13
Composite Table on the Level of Teacher's Transversal Competencies

Domains	Mean	VI
Critical and innovative thinking	3.92	Highly Competent
Interpersonal skills	4.08	Highly Competent
Intrapersonal skills	4.10	Highly Competent
Global citizenship	4.10	Highly Competent
Media and Information Literacy	3.96	Highly Competent
Grand Mean	**4.03**	**Highly Competent**

The result means that the level of teacher's transversal competencies in all its attributes is highly competent. This implies that teachers possess transferrable skills that are relevant in the teaching and learning. Adaptability is highly relevant to teachers given that "teaching work involves responding to and managing constant change" (Collie and Martin, 2016).

It is in equal importance to the findings of Claudiu (2015) showing that transversal skills are useful to each instructor in developing personal projects relating to their professional training and personal performance self - assessment. Moreover, Transversal skills are recognized as essential skills of the teachers in the organization and growth of the teaching and learning process and their teaching of these skills to their students (Čepić et al., 2015).

Level of Teacher's Adaptation to Education 5.0 with Regard to Putting Human Qualities at the Center of Education, Consideration for Learners as Agents of Change, Safety and Ergonomics at School, and Preparing Learners for Holistic, Transformational and Lifelong Learning

Table 14 exhibits the level of Adaptation to Education 5.0 with regards to putting human qualities at the center of Education.

Table 14
Level of Adaptation to Education 5.0 with Regard to Putting Human Qualities at the Center of Education

Putting Human Qualities at the Center of Education	Mean	VI
1. Content of my instruction is relevant to learners' needs and interests.	4.46	Very Highly Observed
2. Classroom interactions and tasks I employ represent how language is used in the real world.	4.40	Very Highly Observed
3. Learners' first language and culture are viewed as a resource for learning.	4.38	Very Highly Observed
4. Classroom tasks challenge learners and promote higher order thinking skills.	4.36	Very Highly Observed
5. Problems are properly selected which are applicable to real situations and allow learners to find solution.	4.34	Very Highly Observed
6. Learners' experience, views, opinions and ideas are given attention without bias.	4.39	Very Highly Observed
7. Learners' differences are accepted and the needs of individual learners are addressed to the best extent possible regardless of other backgrounds.	4.40	Very Highly Observed
Overall	**4.39**	**Very Highly Observed**

The result indicates that teachers have high regard on putting human qualities at the center of education stating that they very highly observed the indicators. This implies that the main priority of teachers is to cater the relevant needs of the learners suited to their interest. In doing so, the target of educating them will be achieved. It also gives an idea that problem solving skills should be enhanced to create a meaningful and practical learning. In addition, the outcome denotes a high level of practice in giving importance to the qualities of learners in the teaching and learning process.

This is supported by the study of Sulkifli (2021) entitled "The Importance of Understanding Student Character to Support Successful Learning in Junior High School" highlighting the findings that teacher's understanding of student characteristics makes it easier for teachers to carry out the learning process; this can be because teachers can provide things that are by student needs and remain based on learning objectives.

Table 15 on the next page depicts the level of teacher's adaptation to Education 5.0 with regard to consideration for learners as agents of change.

Table 15
Level of Teacher's Adaptation to Education 5.0 with Regard to Consideration for Learners as Agents of Change

Consideration for Learners as Agents of Change	Mean	VI
1. Allowing them to give their feedback, views and opinions.	4.41	Very Highly Observed
2. Encouraging them to become collaborative partners in curriculum provision and professional development.	4.30	Very Highly Observed
3. Engaging them in institutional decision-making in order to influence enhancement and change.	4.25	Very Highly Observed
Overall	**4.32**	**Very Highly Observed**

The result indicates that the level of adaptation of Education 5.0 based on the assessment of teachers on how they consider learners as agents of change is very high. This implies that teachers in a large extent give importance to the voice of learners to activate change in the organization. The indispensable feedbacks, opinions, and views of learners matter in crafting policies and updating the curriculum.

This corroborates with the study conducted by Allen (2023) that in terms of how students found the experience of being engaged as a partner in the design of a module, 87% reported it as positive and 13% reported it as neutral. Many who found it a positive experience said something along the lines of "it is nice to have an input," and it was clearly appreciated that this input was sought before, rather than after, the fact. As noted by one respondent "it gives students the chance to be heard and make a difference at the start of the module so that we get to experience what we have suggested." Even those who found it neutral experience were still generally positive.

Table 16 on the next page shows the level of teacher's adaptation to Education 5.0 with regard to safety and ergonomics at school.

Table 16
Level of Teacher's Adaptation to Education 5.0 with Regard to Safety and Ergonomics at School

Safety and Ergonomics at School	Mean	VI
1. Ensuring that learners are free from threats, bullying and harassment.	4.51	Very Highly Observed
2. Maintaining classroom that is conducive for learning.	4.51	Very Highly Observed
3. Introducing appropriate physical exercise in the classroom to keep children healthy and active during school hours.	4.48	Very Highly Observed
4. Providing postural awareness for developing proper body posture.	4.41	Very Highly Observed
Overall	**4.48**	**Very Highly Observed**

The result signifies that teachers have a very high level of adaptation to Education 5.0 in terms of safety and ergonomics. This denotes that teachers are mindful of the safety of learners by ensuring that they are protected from all sorts of harm and possible threats physically, emotionally, and mentally. Promoting a child-friendly school is a must for learners to feel belongingness, love and an atmosphere of positivity all the time to unleash their potentials. Maintaining a conducive learning environment is promoting a higher level of engagement and establish a healthy relationship among students and teachers.

This is in consonance with the findings Ismail et al. (2020) which emphasizes the influence of a healthy school environment on teaching, learning, and student behavior. Clean facilities and health-promoting initiatives positively impact engagement and academic performance. Involving teachers in planning and implementing health and environment programs, along with providing training and incentives, is recommended.

Table 17 illustrates the level of teacher's adaptation to Education 5.0 with regard to preparing learners for holistic, transformational, and lifelong learning.

Table 17
Level of Teacher's Adaptation to Education 5.0 with Regard to Preparing Learners for Holistic, Transformational and Lifelong Learning

Preparing Learners for Holistic, Transformational and Lifelong Learning	Mean	VI
1. Enhancing their innovation skills.	4.30	Very Highly Observed
2. Exposing them to a variety of viewpoints and ideas that can spark their attention and curiosity.	4.35	Very Highly Observed
3. Promoting self-directed learning wherein they are encouraged to learn on their own time.	4.36	Very Highly Observed
4. Teaching them the ability to learn from failures.	4.38	Very Highly Observed
5. Teaching them to set learning goals.	4.38	Very Highly Observed
6. Encouraging them the use of technology to foster their technological competency, which is essential for the development of their 21st century skill set.	4.29	Very Highly Observed
7. Encouraging them to implement what they have learned and use their understanding of the subject in daily life.	4.44	Very Highly Observed
Overall	**4.36**	**Very Highly Observed**

The result means that teachers give very high priority on preparing learners for holistic, transformational and lifelong learning as indicated by very highly observed.

It implies that teachers are focusing ultimately on honing the learners holistically by developing them through transformational and lifelong learning. Teachers are molding the learners to become academically prepared, morally upright and responsible citizens in this age of uncertainty and where change is constant.

The findings of the current study which reflect the positive perceptions and actions of teachers towards preparing learners for holistic, transformational, and lifelong learning in the Province of Laguna, is consistent with the result of the study of Betsy Ng (2023), which underscores that there is a growing need to promote lifelong learning for K-12 education to prepare future generations for the complex and evolving world. Taking this into account, a key focus is to reform education in schools to support students in developing lifelong learning skills to stay resilient. This paper has highlighted that an emphasis on nurturing lifelong learning for K-12 education is essential for success in today's information and knowledge acquisition era.

Table 18 presents the composite table on the level of teacher's adaptation to Education 5.0.

Table 18
Composite Table on the Level of Teacher's Adaptation to Education 5.0

Attributes	Mean	VI
Putting Human Qualities at the Center of Education	4.39	Very Highly Observed
Consideration for Learners as Agents of Change	4.32	Very Highly Observed
Safety and Ergonomics at School	4.48	Very Highly Observed
Preparing Learners for Holistic, Transformational and Lifelong Learning	4.36	Very Highly Observed
Grand Mean	**4.39**	**Very Highly Observed**

The result indicates very high observance of teachers with respect to all the attributes of the adaptation of Education 5.0. This implies that teachers prioritize the safety of learners in all aspects. Another implication of the study is the need to increase the active engagement of learners in institutional decision making in order to influence enhancement and change. Their feedback, views, and opinions are relevant to be listened to in order to build an evidence-base as a basis for enhancement and change.

The result is in consonance with the study of Diestro D. (2022) entitled "Learning Readiness in Education 5.0 as Influenced by Value Creation and Academic Productivity", recommended that teachers may enhance the collaborative-based measurement of learning tasks to fully equip the student's potential. Moreover, they are also encouraged to develop a well-structured learning pathway and learning materials where students could take ideas on how to further advance their skills. In terms of learning readiness in this education 5.0 era, it is recommended that active participation in seminars, workshops, and fora presenting trends and global competitiveness are encouraged to provide a breakthrough among the learners and teachers to enhance their knowhow of the relevant and responsive competencies.

Significant Relationship between Teacher's Technostress and Adaptation to Education 5.0

Table 19 on the next page exhibits the significant relationship between teacher's technostress and the adaptation of Education 5.0.

Table 19
Significant Relationship between Teacher's Technostress and Adaptation to Education 5.0

Technostress	Adaptation	r	p-value	H_0	VI
Techno-Overload	Putting Human Qualities at the Center of Education	.275	.000	R	S
	Consideration for Learners as Agents of Change	.185	.000	R	S
	Safety and Ergonomics at School	.209	.000	R	S
	Preparing Learners for Holistic, Transformational and Lifelong Learning	.253	.000	R	S
	Overall	.257	.000	R	S
Techno-Complexity	Putting Human Qualities at the Center of Education	-.060	.111	FR	NS
	Consideration for Learners as Agents of Change	-.025	.517	FR	NS
	Safety and Ergonomics at School	-.051	.179	FR	NS
	Preparing Learners for Holistic, Transformational and Lifelong Learning	-.013	.734	FR	NS
	Overall	-.041	.280	FR	NS
Techno-Insecurity	Putting Human Qualities at the Center of Education	-.115	.002	R	S
	Consideration for Learners as Agents of Change	-.087	.022	R	S
	Safety and Ergonomics at School	-.115	.002	R	S
	Preparing Learners for Holistic, Transformational and Lifelong Learning	-.084	.026	R	S
	Overall	-.112	.003	R	S
Techno-Invasion	Putting Human Qualities at the Center of Education	.019	.622	FR	NS
	Consideration for Learners as Agents of Change	-.031	.419	FR	NS
	Safety and Ergonomics at School	-.018	.632	FR	NS
	Preparing Learners for Holistic, Transformational and Lifelong Learning	-.007	.863	FR	NS
	Overall	-.012	.757	FR	NS
Techno-Uncertainty	Putting Human Qualities at the Center of Education	.018	.630	FR	NS
	Consideration for Learners as Agents of Change	-.029	.441	FR	NS
	Safety and Ergonomics at School	.015	.684	FR	NS
	Preparing Learners for Holistic, Transformational and Lifelong Learning	-.039	.298	FR	NS
	Overall	-.011	.768	FR	NS
Grand Mean	Putting Human Qualities at the Center of Education	.009	.803	FR	NS
	Consideration for Learners as Agents of Change	-.014	.720	FR	NS
	Safety and Ergonomics at School	-.011	.763	FR	NS
	Preparing Learners for Holistic, Transformational and Lifelong Learning	.008	.825	FR	NS
	Overall	-.003	.943	FR	NS

Positive correlation was established showing that the higher the level of techno-overload, the higher is the adaptation of Education 5.0. On the other hand, negative correlation was established showing that the lower the techno-insecurity, the higher is the adaptation of Education 5.0.

This implies that the high level of teacher's technostress somehow affects the adaptation of Education 5.0. Taking into consideration the immense effect of
technology in the life of teachers, techno-overload in a way helps teachers to become flexible despite the increasing demand to finish more work in a faster mode. Meanwhile for techno-insecurity, fear of using the technology needs to be addressed through technical support provision to even lower down the level to help in the adaptation of Education 5.0.

The result of the correlation between techno-overload and adaptation of Education 5.0 is in contrary to the study of, Galluch et al., (2015) which further explained that technology mediated interruptions can distract the user from completing a work task, which in turn necessitates additional effort (more work) to

return to initial task.

Meanwhile, the result of the correlation between techno-insecurity and adaptation of Education 5.0 supports the findings in the study of Kim & Lee (2021) which states that techno-insecurity has a negative effect on innovation resistance, which means that that the higher the techno-insecurity, the lower the resistance behavior by trying to adapt to the current situation.

Significant Relationship between Teacher's Transversal Competencies and Adaptation to Education 5.0

Table 20 presents the significant relationship between teacher's transversal competencies and adaptation to Education 5.0.

The result reveals that all p-values equivalent to 0.000 did not exceed the 0.05 level of significance which rejected the null hypothesis indicating that there is a significant relationship between teacher's transversal competencies and adaptation to Education 5.0.

This implies that teachers with a high level of transversal skills are able to highly observe the practices in line with Education 5.0. The two variables complement each other having positive correlation. Essential skills to focus on are critical and innovative thinking, interpersonal skills, intrapersonal skills, global citizenship, and media and information literacy to adapt to the constant change.

The result is supported by Aquino, F. (2023) in his study entitled "Transversal Competencies of Values Education Teachers: Pathways to Education 5.0" that teachers are highly equipped with transversal competencies that can be used for this new normal system of education as prescribed by the DepEd basic Education Learning Continuity Plan.

Table 20
Significant Relationship between Teacher's Transversal Competencies and Adaptation to Education 5.0

Competencies	Adaptation	r	p-value	H_0	VI
Critical And Innovative Thinking	Putting Human Qualities at the Center of Education	.430	.000	R	S
	Consideration for Learners as Agents of Change	.403	.000	R	S
	Safety and Ergonomics at School	.320	.000	R	S
	Preparing Learners for Holistic, Transformational and Lifelong Learning	.451	.000	R	S
	Overall	.452	.000	R	S
Interpersonal Skills	Putting Human Qualities at the Center of Education	.544	.000	R	S
	Consideration for Learners as Agents of Change	.422	.000	R	S
	Safety and Ergonomics at School	.446	.000	R	S
	Preparing Learners for Holistic, Transformational and Lifelong Learning	.511	.000	R	S
	Overall	.538	.000	R	S
Intrapersonal Skills	Putting Human Qualities at the Center of Education	.575	.000	R	S
	Consideration for Learners as Agents of Change	.533	.000	R	S
	Safety and Ergonomics at School	.506	.000	R	S
	Preparing Learners for Holistic, Transformational and Lifelong Learning	.579	.000	R	S
	Overall	.617	.000	R	S
Global Citizenship	Putting Human Qualities at the Center of Education	.570	.000	R	S
	Consideration for Learners as Agents of Change	.503	.000	R	S
	Safety and Ergonomics at School	.482	.000	R	S
	Preparing Learners for Holistic, Transformational and Lifelong Learning	.568	.000	R	S
	Overall	.596	.000	R	S
Media and Information Literacy	Putting Human Qualities at the Center of Education	.484	.000	R	S
	Consideration for Learners as Agents of Change	.440	.000	R	S
	Safety and Ergonomics at School	.326	.000	R	S
	Preparing Learners for Holistic, Transformational and Lifelong Learning	.490	.000	R	S
	Overall	.489	.000	R	S
Grand Mean	Putting Human Qualities at the Center of Education	.598	.000	R	S
	Consideration for Learners as Agents of Change	.529	.000	R	S
	Safety and Ergonomics at School	.475	.000	R	S
	Preparing Learners for Holistic, Transformational and Lifelong Learning	.597	.000	R	S
	Overall	.618	.000	R	S

Regression Analysis Showing Teacher's Transversal Competencies as Predictor to the Adaptation of Education 5.0

Table 21 presents the regression analysis of teacher's transversal competencies as predictor to the adaptation of Education 5.0.

Table 21
Regression Analysis Showing Teacher's Transversal Competencies as Predictor to the Adaptation of Education 5.0

	Model	Unstandardized Coefficients		Standardized Coefficients	t	p-value	Ho	VI
		B	Std. Error	Beta				
R^2 =0.41 F=96.498 p-value=0.000	(Constant)	1.877	.117		16.004	.000	R	S
	Critical and Innovative Thinking	-.005	.035	-.007	-.155	.877	FR	NS
	Interpersonal Skills	.077	.046	.087	1.680	0.93	FR	NS
	Intrapersonal Skills	.291	.052	.327	5.618	.000	R	S
	Global Citizenship	.194	.050	.216	3.851	.000	R	S
	Media and Information Literacy	.058	.034	.074	1.703	.089	FR	NS

A scrutiny of the table reveals that R Square as the percentage of prediction equals 0.41, which is not a good fit suggests that only 41% of the variance in the dependent variable (teacher's transversal competencies), that is explained by the predictor variables of teacher's adaptation of Education 5.0 critical and innovative thinking, interpersonal skills, intrapersonal skills, global citizenship, and media and information literacy).

Based on the probability values, two out of five components of transversal competencies namely intrapersonal skills and global citizenship are predictors of adaptation to Education 5.0.

For each unit increase in critical and innovative thinking, adaptation of Education 5.0 increases with 0.007. For each unit increase in in interpersonal skills, adaptation of Education 5.0 increases with .087. For each unit increase in intrapersonal skills, adaptation of Education 5.0 increases with .327. For each unit increase in global citizenship, adaptation of Education 5.0 increases with .216. For each unit increase in media and information literacy, adaptation of Education 5.0 increases with .074.

The findings show that intrapersonal skills and global citizenship are the two components of transversal competencies that affect the adaptation of Education 5.0. This implies that there is a need to develop the other components of transversal competencies such as critical and innovative thinking, interpersonal skills, and media and information literacy even more towards the realization of adaptation to Education 5.0.

The result harmonizes with the findings of Ehondor (2017), that the building of a personal brand begins with looking inward (intrapersonal communication), and, when done correctly, the potential for achieving desired success is more significant. These primary findings are consistent with research showing that the Intrapersonal aspect significantly affected personal goals expected to reflect one's climate. It has a positive effect on choice for permanent employment and the intention to contribute to the territory's development.

Moreover, the result is supported by Grobbauer & Wintersteiner (2019), stating that we have shown that contemporary education means education to become a global citizen, which is why education in global citizenship must become the norm for all education. Having this notion, teachers are becoming more open and

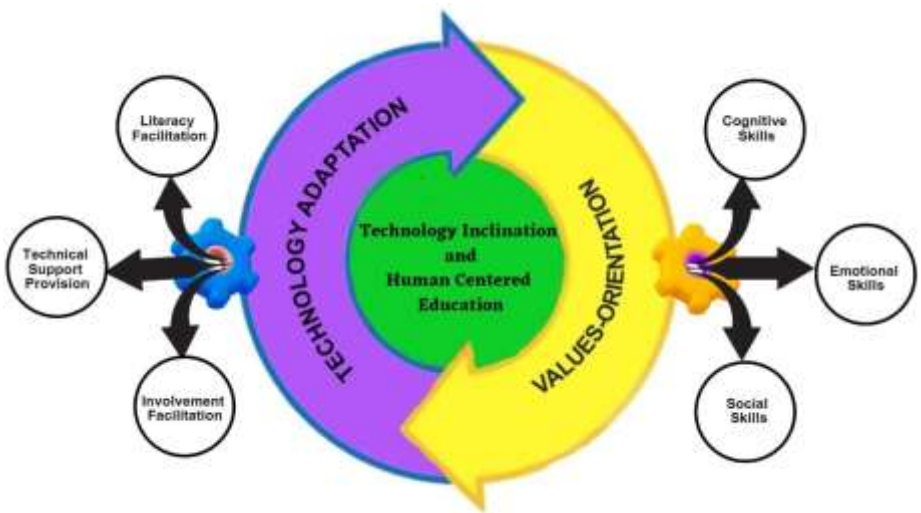
understanding of the interconnectedness leading to the adaptation of Education 5.0.

Developed Model based on the Findings of the Study

Based on the findings of the study and after a thorough analysis, the researcher conceptualized the equilibrium model which depicts the synergy between technology adaptation and values-orientation as mechanisms in the convergence of technology inclination and human-centered education. As presented on the next page is the paradigm that illustrates the concept formed. Shapes , figures and colors were given corresponding interpretations.

The tremendous impact of technology in all aspects of life has influenced the present kind of society, industry, and education. Technology can't be disregarded because it is already ingrained in one's life so there is a need to continue to engage with it. However, one should be mindful of using technology to become less susceptible to its controlling nature. As people accommodate themselves to digital modes of interaction and communication, the patterns of life begin to resemble its ways of interfacing with them. Technology has pushed them to lose the ability to interact with others. As a result, people tend to lose the basic human capacity to show kindness and empathy to one another. Thus, people fall into the trap that they have not created machines that imitate them, but they are the one imitating machines.

The ability to adapt to new technologies is no longer just a desirable skill rather a necessity in our rapidly advancing world. In response to this, technology adaptation is given a high regard to keep on track with the latest trend in education.



EQUILIBRIUM MODEL VIS-À-VIS TECHNOLOGY ADAPTATION AND VALUES-ORIENTATION

The first component of the equilibrium model which pertains to technology adaptation is linked with a gear with three arrows pointing to the three organizational mechanisms that help reduce the undesirable effects of technostress namely literacy facilitation, technical support provision, and involvement facilitation. Literacy facilitation refers to the sharing of knowledge about digital technologies. This collaborative approach

accelerates the phase of adaptation and ensures a more inclusive technology landscape. The second mechanism is technical support provision which pertains to an adequate end-user support for problems with digital technologies. Trainings provided for teachers is crucial to empower them to stay ahead of the curve and remain competitive in an increasingly tech-driven world. The third mechanism is involvement facilitation wherein teachers are involved in the change process. To do this, embracing change mindset is required which is the fundamental aspect of technology adaptation. This kind of mentality fosters resilience and the ability to navigate uncertainties that come with emerging technologies.

The second component of the equilibrium model is values-orientation connected by a gear with three arrows representing the crucial skills needed to be developed to gain a more equipped mindset with the enhancement of cognitive skills, stable emotions pertaining to the development of emotional skills and a wider reach of social connectivity as to improvement of social skills to compliment with technology adaptation pointing to the end goal of solidifying technology inclination and human centered education. The aspects of transversal competencies under cognitive skills are critical and innovative thinking, and media and information literacy which use the mind to properly process information to become more open-minded which tolerance, curiosity and creativity are nourished. Meanwhile, Intrapersonal Skills fall under emotional skills where emotional regulation is harnessed to resist stress, be goal-oriented and remain optimistic. Moreover, under social skills are interpersonal skills and global citizenship focusing on collaboration, values and respects for diversity, and interconnectedness. Engaging with others as a manifestation of social skills could enhance sociability, assertiveness, and energy.

The integration of the components of the equilibrium is a manifestation of the interrelationship of the mechanisms to achieve the end goal of promoting technology inclination and human centered education in this rapidly advancing world. It encapsulates Education 5.0 as a human-centric design solution in which humans and machines collaborate in a shared working environment. Humans and technology as independent entities collaborate for solving complex problems, driving innovation, improved decision making, positive societal change, and achieving a sustainable future.

To synthesize, the synergy of technology adaptation and values-orientation and its underlying mechanisms encapsulates the **"Technology Adaptation and Values-Orientation Equilibrium Theory"** that equates to the notion that "**A school that practices technology inclination and human-centered education, mechanized by technology adaptation and values-orientation."**

Summary of Findings, Conclusion and Recommendations

This chapter presents the summary of findings sought, conclusions drawn, and recommendation offered.

Summary of Findings

Based on the analysis and interpretation of data, the following findings are hereby summarized:

1. **Level of Teacher's Technostress in Terms of Techno-Overload, Techno-Complexity, Techno-Insecurity, Techno-Invasion, and Techno-Uncertainty**

In the assessment of five (5) technostress, techno-overload, techno-invasion and techno-uncertainty obtained the high level of technostress. On the other hand, techno-complexity and techno-insecurity obtained average level of teacher's technostress. The overall findings revealed that the level of teacher's technostress is high.

2. **Level of Teacher's Transversal Competencies in Terms of Critical and Innovative Thinking, Interpersonal Skills, Intrapersonal Skills, Global Citizenship, and Media and Information Literacy**

The level of transversal competencies of public elementary school teachers, as perceived by themselves, varies across different aspects viz Critical and Innovative Thinking, Interpersonal Skills,

Intrapersonal Skills, Global Citizenship, and Media and Information Literacy. The grand mean divulges, that teachers are highly competent in terms of transversal competencies. Teachers view Intrapersonal and Global Citizenship certainly high, while Creative and Innovative Thinking garnered the lowest rating.

3. **Level of Teacher's Adaptation to Education 5.0 with Regard to Putting Human Qualities at the Center of Education, Consideration for Learners as Agents of Change, Safety and Ergonomics at School, and Preparing Learners for Holistic, Transformational and Lifelong Learning**

Among the four (4) attributes of adaptation to Education 5.0, "safety and ergonomics at school ranked the highest, while "consideration for learners as agents of change" ranked the lowest. The results revealed that teachers have high regard to the holistic development of learners.

4. **Significant Relationship Between Teacher's Technostress and the Adaptation of Education 5.0**

In terms of the correlation analysis, the result revealed that out of the five techno stressors, only techno-overload and techno-insecurity established significant relationship. Techno-overload and Adaptation of Education 5.0 showed a positive correlation, while techno-insecurity and adaptation to Education 5.0 revealed a negative correlation. Subsequently, the rest of the technostress creators such as techno-complexity, techno-invasion and techno uncertainty have no significant relationship with the adaptation of Education 5.0

5. **Significant Relationship Between Teacher's Transversal Competencies and the Adaptation of Education 5.0**

In terms of the correlation between teacher's transversal competencies and the adaptation of Education 5.0, the results showed that there is a significant relationship between the two variables.

6. **Regression Analysis Showing Teacher's Transversal Competencies as Predictor to the Adaptation of Education 5.0**

Among the components of transversal competencies, intrapersonal skills, and global citizenship emerged as predictors of the Adaptation to Education 5.0.

Conclusions

Based on the summary of findings the following conclusions were drawn:

1. Teachers are experiencing high level of technostress due to the rapid development of technology.
2. Teachers are equipped with transversal competencies that help them adapt to an ever-changing environment.
3. Teachers possess high level of intrapersonal skills and global citizenship which positively affect the adaptation of Education 5.0.

Recommendations

From the careful analysis of the findings, along with the conclusions drawn, the following recommendations are hereby offered:

1. Advocacy on technology adaptation can be implemented through technostress inhibitors such as literacy facilitation, technical support provision, and involvement facilitation to minimize the negative effect of technostress to teachers.
2. Trainings for teachers in digital literacy may be given fund allocation.
3. Technostress wellness program for teachers may be implemented.
4. Parallel studies may be conducted considering other variables, using a wider scope and employ a qualitative research design to have an in-depth result of the study.

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