CHAPTER II

REVIEW OF RELATED LITERATURE AND STUDIES

This chapter basically shows the sources of research and literature. The information in the studies are both foreign and local researchers which may essentially help with the research. This is required for researchers to gain a more comprehensive knowledge in the study.

Education System and Issues

Education has always been an essential factor towards life improvement. In the Philippines, the education system is still developing. According to [6] the first stages of Philippine Education were informal, unstructured and devoid of methods. The majority of development of the system of education started during the Spanish colonization [7]. During this era, the education was religion-oriented until independence starts in 1946 due to United States colonialization [6] – [7].

The Philippines had an 11-year basic education period consisting of grades 1 to 7 and four years of high school [7]. Following the war, the American colonial government recommended a conversion to the American system: six years of elementary school (rather than seven),

three years of junior high school, and three additional years of senior high school, for a total of 12 years of basic education. The transition started with the end of Grade 6, but the two-year extension to high school was never completed. Balansag [8, p. 2] stated that it has been the goal of the Philippine education system to innovate curriculum into globally competitive structure.

In 2012, the curriculum of K-12 in the Philippines was introduced, after the progress of the Kindergarten Act and the Enhanced Basic Education Act in the same year [9] – [10]. In 2013, the Department of Education facilitated several of trainings to the teachers. As mentioned by Alsubaie [11, p. 107] that teacher involvement is important for successful and meaningful curriculum development. Teachers being the implementers are part of the last stage of the curriculum development process. In relation to [8, p.2], it is evident that teachers are also part of the innovative curriculum.

However, in the year 2020, Gayo and Yap [12] mentioned that the world has encountered a new virus named "SARS-CoV-2" with the strain's similarities to the SARS-COV and later on the disease is called "Coronavirus Disease 2019" (COVID-19). For almost two pandemic months, most countries around the world have temporarily closed educational institutions to contain the spread of the COVID-19 pandemic and reduce infections [13]. Crawford et al. [14] noted responses like community lockdown and community quarantine of several countries had led students and teachers to study and work from home, which led to the delivery of online learning platforms. The

implementation of online learning posed different risks, problems, and challenges to both the teachers and students, especially in the higher education institutions (HEIs) [15, p. 141].

However, besides the fact of [15, p. 141], Preschool education, on the other hand, is interrupted during pandemic because there are no related programs and because such programs would have to be child-centered, not subject-centered [16]. Although, as stated by Burgess and Sievertsen [17] and Viner et al. [18, p. 397 - 404] some studies have investigated the effects of outbreaks on education, there is no research on how to carry out preschool education during outbreaks, causing uncertainty for preschool teachers and parents. As a result, more studies should be done to guide preschool teachers and parents in collaborating to achieve sustainable preschool education during pandemic.

Children Learning Development and Psychology

Taking into account the capabilities of children when it comes to using the proposed system, further research is conducted regarding a child's cognition and learning process. Childhood is truly a delicate stage in growth and development as a person. According to [21], there have been great evidences from various other studies that skills that increase positivity, resilience, engagement and meaning can be taught and attained by schoolchildren at a very young age. This may be the motivation for other researchers to try and make sense and have a better understanding of the development of children. [19]The role of children's

early skills in charting later developmental trajectories has been archived across a wide range of study. This solidifies the idea that the development of skills amongst children play a great role in their future.

There are also theories pertaining to the factors affecting the ways in which a child learns and grows. [23, p. 7]There are developmental theories which dabbles upon the changes in the child resulting from interactions between growth and learning as well as the behaviorist theories which emphasizes learning with the changes happening in the environment. And because children tend to be enrolled to schools for earlier education, there are more factors that even teachers need to consider in order to ensure the proper learning of children. [22] The children's readiness, classroom environment, methods of teaching, assessments, and teaching aids are multiple factors needed in order to provide an effective simulative teaching and learning environment.

Children are constantly engaged in making sense of their surroundings and sharing their perspectives. Play-based learning aids in the development of social skills, motivation to learn, and even language and numeracy skills in children. Piaget saw play as essential to the development of children's intelligence. According to this play theory, as a child grows older, their environment and play should encourage further cognitive and language development [27]. Based on the study of Pardue [25], it reveals significant differences in the definitions of "child-directed" and "playbased" learning among Filipino preschool directors and teachers, and it also identifies apparent cultural barriers to more effectively implementing child-directed learning. According to the

findings of [26], public school educators describe play as a tool for learning, enjoyment, exploration, and motivation. The participants demonstrated complete understanding of the benefits of play to the development of the physical, mental, and emotional aspects required for learning.

And since the emergence of technologies into the norms, it has paved new ways for teaching and learning using new media contributing to the factors affecting the learning process of the students. Tied up to this is the correlation of entertainment to the modern era which can be utilized as a means to create an interactive learning environment appealing most especially to the younger students. According to [20], it is very important to understand the children's needs and create visionary interactive systems designed to the enhancement of education and entertainment. Knowing how to deliver corresponding features that would enable quality learning on specific target areas makes the difference in the development of the child's skills and knowledge. As stated in [24], combination of interactions with varied sensory and cognitive stimulations may have the potential to have positive or negative impacts on attention, fine motor control and other cognitive domains. This proves that the design of such systems shall be intricate enough to mesh early education with entertainment in order to make a reliable end product.

Transition of Learning in the Philippines

Traditional teaching was the long-established teaching style in Philippine education system wherein the students are passive in terms of participating in class [8, p.2]. Live interaction makes it easier for students to communicate easier with their teachers, rendering study-related matters and inquiries are easily addressed [28]. The way in which traditional methods were taught ensured that students were rewarded for their efforts, used class periods efficiently and exercised clear rules to manage students' behavior [29]. They were based on established customs that had been used successfully in schools over many years. In relation to [22], it is evident that traditional learning is essential in terms of teaching children.

Traditional learning has been the most common method of teaching and learning among educational institutions. However, there are downsides with traditional learning that may hinders the students learning. As stated by [8, p.2], the education should be developing. Since were in the 21st century, the educational system adapting to digital learning is essential. [30] Singapore, Taiwan, Hong Kong, Japan and other parts of Asian countries have already advanced their technological capabilities in terms of the delivering quality instructions. Nevertheless, Philippines is on experimental stage in the development of digital learning [31].

Traditional learning in the Philippines is starting to disappear and faces challenges in access towards distance learning [32]. Although

it is practiced all over the world, it is losing its prevalence. [33] Stated that, country is developing and becoming a part of a digital revolution where education is mostly based on digitized education. Technology has been proven to be very helpful in educating student. Visual presentations, educational videos, interactive programs, learning tutorial and variety of books available all the time on internet has revolutionized education in a better way [34].

In addition, COVID-19 has been a huge factor in transition of learning system. According to Toquero [35], there is a stronger need for academic organizations to improve their curriculum and the usage of new instructional methods and strategies should be of utmost significance. In relation to [8] and [31], the Philippines is still adapting the fundamentals of online learning that will be used in this time of pandemic.

Computer Aided Instruction and Adaptive Learning

Computer-aided instruction (CAI) is the interactive and instructional presentation of various forms of educational media material. The use of a computer as a method to promote and enhance instruction is known as CAI. Ruliah et al. [36] have noted CAI programs address topics through lectures, drill and practice, simulation, and problem solving, and they assess the student's comprehension. Nowadays, teachers have access to technological applications that can help them improve the effectiveness of their teaching and learning. One of the technologies is computers that can be used in the learning

process. Some instructional approaches are computer-assisted and can be accessed through a computer. CAI-based teaching materials, according to [37] are a type of content delivery method that uses a variety of media to educate students. A computerized framework is used to design and configure the interactive media. As shown by [33], CAI can be utilized to assist in the design, analysis and manufacturing of products in teaching delivery which involves text and image identification for kids under the ages of 2 to 5 years to improve their learning.

Computer-aided instruction appears to be a perfect method, it does have some drawbacks. [39] The cost of computers, electronic devices, and software is high. As a result, providing a computer for each student is simply not a feasible target. [40] It is difficult to motivate and prepare teachers to use computers in class. They can be apprehensive about this new device. They may be hesitant to devote additional time to CAI planning, collection, and application. [41] On the other hand, teachers can lead the way by preserving personal relationships, creating new habits, reimagining timelines, and providing additional help to students. They may not be able to reproduce classroom instruction in the event of a pandemic, but they can definitely use resilience and fortitude to keep students learning in the days ahead.

Although there are drawbacks in implementing CAI, the benefits of CAI will greatly outweigh those disadvantages. Computer assisted learning has the potential to completely transform the educational process and significantly increase learning efficiency by providing

children with a sense of purpose. According to Sharma [40], CAI is individualized, meaning that each student is free to work independently of the performance of other students. In addition, [42] CAI also assisted preschoolers in learning interactively through the lessons presented and in recapitulating what they had just learned. Funcion et al. [44] mentioned that CAI can also provide a more adaptable, creative, and enjoyable environment for pupils' learning experiences. Shamir et al. [43] stated that students who used the CAI program has highest score on the tests, implying that the positive impact on academic performance would have been much greater if the software had been applied with minimal usage expectation for all students. As long as the benefits and drawbacks are controlled, using CAI can be an excellent way to incorporate new technology and enhance the learning experience.

In developing a CAI, adaptive learning will be used to fortify the learning progress of the users in using such systems. Adaptive learning, also known as adaptive teaching, is the delivery of custom learning experiences that address the unique needs of an individual through various means. By doing activities that apply adaptive learning, the user's progress will determine the occurrence of adaptive teaching like just-in-time feedback, etc. The [45] supports this as it states that adaptive learning activities can adjust in real time to a learner's needs, encouraging the development of higher-level abilities such as combining information from many fields to solve real-world situations. This implies that guiding a learner's capability with real time assistance helps them develop and apply such knowledge gathered into the real world.

In the subject of learning, educational games especially those dedicated for children often use adaptive learning as a way to train the users in playing the game. According to [46], adaptive games are considered superior over non-adaptive games due to the fact that the children's performance are assessed constantly and adjust the difficulty of activities to match the children's individual level. This shows that adaptability towards learning even in educational kids games shows great influence in the improvement of the children's performance.

There are also factors to consider for adaptive learning in order to successfully implement it. Directly quoting from [47] it explains that '(1) apart from learners' cognitive ability, it is important to consider affective factors such as motivation in adaptive learning, (2) lack of alignment among various components in an adaptive system can impact how learners accessed the system and, more importantly, their performance, and (3) visualizations can reveal interesting findings that can be missed otherwise.

Synthesis

With the relating literature that tackle about the education system especially in the Philippines, There is a slow grasp on the changes happening towards the curricula and methods of learning that are being adapted by the nation's educational system. The teachers are also found to be an important media for the student's learning and the Department of Education recognizes this and conducts trainings that will enhance

and develop the skills they need in teaching either traditionally or virtually. And because the pandemic struck, it has transpired schools to shift to online learning platforms which was and abrupt change in the pace in the delivery of education which affects preschool education badly because there is no guaranteed solution that enables the preschoolers learning in a rather complex online platform. Taking this into account, researches relating to a child's cognition, psychology and learning process is also explored in order to makes sense on how to approach the proposed CAI for the preschool children.

The children's thinking and learning process proved to be relevant in various researches in explaining the relevance of a child's skill and knowledge development in their later trajectories in the future. There are also theories that factor in the interactions and learning environment of a child affecting their cognitive development. There are also factors pertaining to play as a means of learning which upholds an entertainment based learning dedicated for the children in preschools as well as the teacher's and their way of teaching and presenting learning materials to engage their students.

Understanding the premise of traditional learning towards students is essential in order to gain knowledge of the process together with the advantages and disadvantages posed by this method of learning and use the information to come up with a solution to enhance the learning experience with the implementation of an online medium that aids learning. The traditional way of learning has ensured an effective way in managing the student's behavior as well as their academic

performances with the help of live interactions which bridges communication between the teacher and the students with regards to study related matters. Even with the effectiveness by this method of learning, expanding the media in which a children can learn is a must in order to cope with the worldly advancements in education.

Extensive research regarding the CAI together with its development, advantages and disadvantages is done to gain a better grasp in preparation for the development of the proposed CAI system dedicated to preschoolers. CAI is defined as a tool that helps aids learning by presenting instructional materials with the use of computers. And, with the abundance of digital media, educational institutions should be able to train the teachers to adapt to a more flexible medium of teaching the students. There are also drawbacks with the use of CAI like the preparing the teachers in using the computers to assist them in teaching which shall be taken into account in order to be able to create an interface correlating such concerns. The concept of adaptive learning is also established as well as the factors that tie in with the overall learning progress of the students.