TECHNOLOGY INTEGRATION IN EARLY YEARS CLASSROOM:
VOICES OF PARENTS AND TEACHERS

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STAFF MEMBERS. Thank you so much for enhancing my knowledge, helping me in many ways and making me feel like a part of the IOBM family.
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ABSTRACT
Research highlights that in early years, teaching through technology plays a significant role if it is connected with relevant learning experiences (Willis, Weiser & Kirkwood, 2014). Technology helps children to experience meaningful activities which result as to enhance skills like problem solving, collaboration and social negotiation (Clements & Sarama, 2002; Freeman & Somerindyke, 2001; Wang & Ching, 2003). While, country like Pakistan is still facing difficulty in terms of giving quality of education and also to achieve 100% literacy rate; due to failure of implementation plan, corruption, structural and organizational dynamics and cultural barriers (Hunzai, 2007). The perspective of education system of Pakistan needs to make a shift from traditional practices to modern techniques (Sajid, 2013). Different research inform that teachers are found teaching young children with a traditional approach, schools have been observed to lack a serious attitude towards the advantage of applying modern approaches to make learning meaningful for children and parents are not aware how to create the positive learning environment for their children at home (Ahmad, 2011; Hunzai, 2007; Sajid, 2013; Zada, 2014). Aim of this research is to experiment the difference between traditional based teaching and technological based teaching in early years classrooms within the context of a mediocre private school system based in Karachi. It focuses on the cognitive and social development of the students in both the scenarios and evaluate outcomes at the time of practicing activities, interaction with others, changes in behavior, response to the open-ended tasks and application level of discovery-based activities. It also helped to understand the perspectives of parents regarding the application of technological-based teaching and their observation to the social development of the children before and during the intervention. This study was conducted as mixed method experimental design. To gather quantitative data, children between 4 to 5 years of age targeted as samples. Two different groups as control and experimental group comprised of 60 students taught through two different methods of teaching. Later, students were assessed to identify the result of teaching through traditional method and technology integrated lessons. To gather the qualitative data, four early years teachers teaching to the same level and four parents of the same groups were also participated in this research. Parents and teachers were interviewed to understand their perceptions, support system, technology relationship with social development and challenges they face to implement technology-based teaching with early years children. Findings of the research proposed the significant difference of cognitive and social development of early years students due to technological-based teaching strategies. Furthermore, it revealed that parents have some reservations
with the technology use; however, it was found from the demographic data that despite of having reservations they do give gadgets to their children to access at home without any assistance. Moreover, data informs that teacher experienced technology as a helpful tool for the children to use in teaching different topics. Teachers also highlighted that school should be having a great contribution to support this notion and provide relevant resources to promote technology-based teaching and learning. As challenges, participants mentioned that technology may reduce the difference of social class or may not. For this reason, it was proposed to encourage group learning in the classroom. This study recommends the involvement of parents in educating them to create meaningful learning opportunities for their children, teachers’ professional development to bring innovations into teaching through using technology and also to provide resources to the students through which 21st century skills can be promoted.

**Key words:**
Early Childhood Education, traditional teaching, technology-based teaching, cognitive development, social development, stimulation.
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<table>
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<tbody>
<tr>
<td>BA</td>
<td>Bachelor in Arts</td>
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<tr>
<td>B.Com</td>
<td>Bachelor in Commerce</td>
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<tr>
<td>CAIE</td>
<td>Cambridge Assessment International Education</td>
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<tr>
<td>ECE</td>
<td>Early Childhood Education</td>
</tr>
<tr>
<td>ECCE</td>
<td>Early Childhood Care and Education</td>
</tr>
<tr>
<td>GPE</td>
<td>Global Partnership for Education</td>
</tr>
<tr>
<td>ISTE</td>
<td>International Society for Technology in Education</td>
</tr>
<tr>
<td>LMI</td>
<td>London Montessori Institute</td>
</tr>
<tr>
<td>MA</td>
<td>Master in Art</td>
</tr>
<tr>
<td>NAEYC</td>
<td>National Association for the Education of Young Children</td>
</tr>
<tr>
<td>NETS-S</td>
<td>Educational Technology Standards for Students</td>
</tr>
<tr>
<td>SDGs</td>
<td>Sustainable Development Goals</td>
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<tr>
<td>UNESCO</td>
<td>United Nations Education, Scientific, Cultural Organization</td>
</tr>
<tr>
<td>UN</td>
<td>United Nation</td>
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<tr>
<td>UNICEF</td>
<td>United Nations International Children’s Emergency Funds</td>
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1. CHAPTER ONE: INTRODUCTION

The world is confronted with social, economic, cultural, health and most importantly, issues related to education. (Sajid, 2013). Toffler (1991) claimed that in 21st century, illiterates are not the ones who do not know how to read and write, but those who cannot “learn, unlearn and relearn” (p.7). This versatile century is demanding high from people around the world to work as a global society and create partnerships to reform nations. It considers the role of education as to shape human beings for creating pathways for globalization (Velde, 2005). The idea of globalization is well-taken by developed countries, which is also the reason they seem to be successful; however, the biggest ground for their success is the excellence and accessibility of their education system. Velde (2005) highlights that “the quantity and quality of education and training determine whether and how countries can participate in the processes of globalization” (p.5). Moreover, national policies also have an essential role to play in the reconciliation of human capacities and creating the maximum impact on physical, social and economic development. However, the contextual reality in developing countries informs about the multiple issues due to which children are unable to receive their basic education which hinders the development of those countries. Rueckert (2018) opines that the reason behind this issue is not only the accessibility of education, but factors like having no school to attend, untrained teachers with lack of understanding, effective learning through effective teaching, missing practice of inclusion, lack of learning resources, long distance of school from home, hunger and nutrition, poor implementation of policies and a country being victim of conflict also come into play.

1.1. Background of the Study

Global goal for education 2030 was designed to achieve inclusiveness and equitable quality for the developing countries in the world by 2030. To support this idea, Global Partnership for Education (GPE) provides a platform to 66 developing countries with the aim to strengthen the education systems with access, quality and inclusion. Pakistan being one of those countries getting support from GPE to enhance the level of education with defined commitments. There are eight specific areas in which GPE is working with those countries to synchronize their success with the demand of globalization; most importantly, Early Childhood Care and Education (ECCE) is one of the crucial areas catering to the long-term investment to prepare children for “learning and allowing them to thrive later in life” (Global Partnership for Education, 2018). UNESCO, UNICEF, Brookings Institution and the World Bank in
2017, by giving the reference of Sustainable Development Goals (SDGs) mention that, for the first time ever learning in early years and its development was featured in SDGs which set an ambitious example to ensure, “all the girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education” (UN, 2015, Target 4.2). The purpose of this target is to develop communities in terms of getting quality of education, feasibility and accessibility to associate with the readiness for primary education. Statistics shows that there are 150 million children aged between 3 to 5, who do not have access to pre-primary education and out of them 80% are those who belong to low income families, which is an alarming situation for our country that we need to reduce this disparity for our nation to get success and develop equally (GPE results report, 2016, p. 87).

Beckley (2012) defines that education at each level has its own importance; however, education in the early years is becoming a global responsibility for the stakeholders to maintain best practices and also to meet the global influences in the contemporary world. Lauder, Lowe and Chawla-Duggan (2008) second this idea and assert that improving early childhood education is well-connected to the lifelong learning and many international policies rationalize the effect of streaming the best practices into early years programs, which help countries to develop themselves economically. Quality in early years education helps nations reduce drop-out rates and bring positive outcomes to prepare children for the primary level education (GPE, 2018).

Pakistan, as one of the developing countries, is facing challenges in terms of providing quality education to its student population due to various reasons. The outcome of many local researches identified some reasons of this failure. Few of them are not initiating reforms, which can help countries strengthen their education systems; inefficient to convert teaching and learning process into effective pedagogy; lack of readiness of institutions; lack of competency of teachers; complex organizational dynamics and poor implementation of national policies (National Education Policy Review, 2006; Syed, Asif & Yousaf, 2011; Sajid, 2013). History of Pakistani education system since independence have referred to achieve 100% enrollment of students at primary and secondary level (Syed, Asif &Yousaf, 2011). To make it possible, different plans have also been developed by different governments; however, the country remained unsuccessful in accomplishing the set targets due to political, economic, and social issues (National Education Policy Review, 2006).
To overcome the aforementioned issues, the perspective of education system of Pakistan needs to make a shift from traditional practices to modern techniques. Our country needs a big change to redefine our practices which will further help to uplift the society and build a new nation with a better, more focused agenda (Sajid, 2013). With reference to the National Educational Policy (2009), one of the most significant initiatives taken by Pakistani education system is to enhance the quality of early years education for the children to overcome problems which relate to the quality and accessibility of education. This agenda is set to meet the global demand of the society and to motivate people for providing better learning opportunities during early years education. Early childhood education is considered to be a crucial time period when most of the learning occurs with different supporting factors (Department of Education and Early Childhood Development, 2010). In 1970, early childhood education in Pakistan was introduced with the name of Katchi classes and then reformed through different approaches and this concept was further introduced as formal pre-primary classes in primary schools (UNESCO-IBE, 2008).

The National curriculum of early childhood education (2007; 2017) informs about the paradigm shift of an education system at early years with meaningful approaches to teach joyful learning experiences and building social reforms to enhance capabilities of future generation (Syed, Asif & Yousaf, 2011). Early Childhood Education (ECE) is also termed as pre-primary education provided in schools. ECE is inclusive with health and nutrition provisions as well. The word Early Childhood Development (ECD) is also used with the term of ECE which concentrates on good health and education provision of a child from 0-8 years with emphasis on child and mother during post-natal care as well (Evans & Myers, 2000; Penn, 2004). Early childhood education provides the bedrock and strong foundation not only for effective primary education but also for later in life. This reality has been obvious for human beings from centuries ago when the Holy Prophet (SAW) said to seek knowledge from the cradle to the grave (Ahmad, 1994). Experts recommended that young children should be gradually motivated towards learning through activities which are interactive and interesting for them. In ECE classes, children should be provided a safe, nurturing and stimulating environment. Due to various gaps in the implementation of policy provision like provision of safe, nurturing and stimulating environment, opportunities for creativeness, provision of resources and particularly lack of understanding about importance of Katchi classes, our traditional Katchi class does not qualify to be considered as good quality early childhood education (Government of Pakistan 2009). Taking all
substantial factors into consideration, UNESCO in Education 2030 agenda reinforces to ensure 100% access to early childhood education and care to make them lifelong learners and support their wellbeing (UNESCO, 2015). Schools are found responsible to provide best learning opportunities to early year children which is perceived to be a significant role to build strengths among young students to foresee the economic development of the country (Beckley, 2012).

Early childhood education merely concentrates towards the global competency, which is to integrate the assistance of technology in early years classroom. To support this idea, National Education Policy (2009) diverts the attention of stakeholders towards many positive approaches and one of them is integrating technology in the teaching and learning process. Use of technology in early years classroom helps to create a strong connection between theory and practice. It further enhances teachers’ ability to overcome the misleading factors and implement the use of technology in their classrooms effectively (Keengwe, Onchwari & Wachira, 2008). Research also informs that teaching through technology in early years classroom, stimulate learners to learn different skills like problem solving, collaboration and social negotiation (Clements & Sarama, 2002; Freeman & Somerindyke, 2001; Wang & Ching, 2003). While use of technology in early years classroom has also been observed as a debatable topic in some literature. According to Cordes and Miller 2000; Healy 2003 use of technology is found as a threat for playful learning and child’ development. They argue that ICT use lead to “lack of exercise, isolated lives, poor concentration, and impaired language development” (p.5). While, other researchers believe that technology is useful for young learners in different aspects of learning. For example, it gives an opportunity to the child to explore and learn through discovery; it helps a child hold on to some challenging activities; it can stimulate creativity and play which leads to cognitive and social development and it also teaches how to enhance curiosity for learning in learners (Bolstad 2004; Hatzigianni & Margetts 2012). National Association for the Education of Young Children (NAEYC, 2000) informs that the best use to support student learning could be helpful if it, “emphasizes knowledge construction; invites open-ended learning; entrench authenticity; includes student cooperation and collaboration and also integrates mixed ability levels and uses different means of instructions where it is required” (p. 4). Hence, to encourage the meaningful learning opportunities and keeping the contemporary part of education with the demand of 21st century, International Society for Technology in Education (ISTE) in 1998, launched the National Educational Technology Standards for Students (NETS-S), which was further revised in 2007. The purpose of NETS-S was to profound the
substantial standards for the students, to enhance technology-based teaching with security, ethics and individual skills (Grant & Mims, 2010).

The advancement of technology enables learners to explore different occasions and ways to get the information through different sources and provides an opportunity to study through student-centered instruction, cooperative learning and also increases the interaction between teacher and student (Willis, Weiser & Kirkwood, 2014). In order to facilitate effective teaching and learning process, technology integration in early years setting becomes an evocative means for significant stakeholders (curriculum advisors, principals, teachers, students and parents), to support learning with the global standard of education (Tinio, 2003). With reference to early childhood education, technology integration in teaching and learning process found as providing supportive learning environment for the young learners.

1.2. Context of the Study

Being a part of private education system, I take pride in introducing initiatives for my students, to engage them in meaningful activities and introduce them with positive learning outcomes. Soon as my responsibilities were changed from teaching to being a coordinator and then from coordinator being principal, I found myself extra responsible for the holistic development of my students. Along with this, I encountered particular situations which compelled me to search solutions for them. My interest towards this study linked with three critical incidents- One was regarding poor academic performance of a particular child who was in kindergarten; the second was the behavior issue of a nursery student; and the third was my daughter’s interest in watching YouTube videos instead of participating in social activities. With further investigation, I found one thing common in all critical incidents, which was the misuse of technology and lack of guidance given to the children by their parents. I also observed frequently that parents provide gadgets to their children without any purpose and they use it unconsciously, which results in a distracted attitude towards academic and social activities. The role of the teacher in this scenario remains passive as they are helpless and have no control over the decisions made by the parents in this regard. Parents on other hand, are willing to give digital devices to their children aimlessly and according to their convenience. As a responsible stakeholder, I was keen to find out what influence aimless use of technology has on students’ academic and social behavior and how technology-oriented activities with a purpose could improve the academic outcomes of the students.
I pursued this agenda and started looking at the practices outside and within the context which supported the idea of using technology in early years classroom to make learning effective and productive. This study supports the ideas presented by Bolstad (2004) and Hatzigianni and Margetts (2012) and many other researchers who claim that “technology is changing the business of teaching” (Keengwe & Onch万里, 2009, p. 209). This research was conducted with the purpose to gather the outcomes which appeared through stimulating learning environment from traditional practices to a technology-based teaching style in the early years classrooms. The context of the study referred to the instructional practices through which teaching and learning processes were supported and knowledge was constructed through meaningful activities in a private school setting.

### 1.3. Problem Statement

The generation of 21st century is more into technology, whether it be in the form of gadgets as mobile phones, tablets, I-pads, computers or any kind of communication method. They tend to use it at young age due to the accessibility and fascination associated with the objects (Gikas & Grant, 2013; Kemp, 2017). The curiosity of using technology and the tendency of adopting new century computer skills is often not considered to be a faulty trait because it is mostly thought to be used for meaningful purposes. Research studies are the witnesses of some result outcomes which revealed that a lack of understanding regarding technological skills, turned students’ capacities into less productive knowledge. It may reflect from their attitudes and cognitive development in form of less competency in knowledge and skills (Alberini, 2006; Hargittai, 2010; Pelgrum, 2011).

The execution of this idea relies on multiple factors; such as school belief towards technology integration in education, teachers’ and parents’ self-expertise, teachers’ and parents’ perceptions and beliefs, readiness for acceptance, teachers’ level of motivation, resource allocation and parents’ support (Woodbridge, 2004). Different research inform that teachers are found teaching young children with a traditional approach, schools have been observed to lack a serious attitude towards the advantage of applying modern approaches to make learning meaningful for children and parents are not aware how to create the positive learning environment for their children at home (Ahmad, 2011; Hunzai, 2007; Sajid, 2013; Zada, 2014). Furthermore, Parette, Blum and Quesenberry (2013) describe that affordability and accessibility observe as another challenge to incorporate technology in early childhood educational setting. Teachers due to the lack of resources face difficulty in providing this opportunity to the students so they can learn through technology.
1.4. Rationale of the Study

Research highlights that in early years, teaching through technology plays a significant role if it is connected with relevant learning experiences (Willis, Weiser & Kirkwood, 2014). Sivin-Kachala and Bialo (2000) observed that if the students are exposed to a technologically rich environment through positive and consistent patterns in their learning experiences, it helps them in their cognitive development. The need of this research was also significantly relevant from the national curriculum of Early Childhood Education point of view, which was developed in 2007 and reviewed in 2017. This study was conducted to promote the competence level of education which can enhance young learners’ ability of constructing knowledge, building relationships to understand human behavior and prepare themselves for global challenges. In this research context, teachers were provided an opportunity to experience how learning becomes meaningful through technology, which would help them learn about digital content and avail learning opportunities for students to meet their diversified needs (ISTE, 2017).

This study aims to experiment the difference between traditional teaching and technologically enhanced teaching methods in early years classrooms. It focuses on the cognitive and social development of the students in both the scenarios and evaluates outcomes at the time of practicing activities, interaction with others, changes in behavior, response to the open-ended tasks and application level of discovery-based activities. It helps to understand the perspectives of parents regarding the application of technology-based teaching and their observation to this approach. This study investigates the motivation level of teachers and also to understand the supporting factors to promote this idea in school and also at home through parents’ support.

1.5. Significance of the Study

In developing countries, many empirical researches have been conducted to identify the possibilities of the use of technology with early years children (Bolstad, 2004), Hatzigianni & Margetts, 2012); however, in Pakistan there is a gap to identify the empirical research study which can identify the use of technology with young children. Nevertheless, researchers like Ali, 2015; Daraz, 2007; Khuwaja, 2009; Wali, 2013; Zair, 2010 only focus on the integration of ICT at primary level with particular subjects like English, Mathematics, Science and Social Studies. Nonetheless, early year’s literature talks about holistic development which means every subject has its own importance. This study will enhance the understanding of stakeholders regarding paradigm shift of teaching from traditional instructional methods to technology-based teaching techniques, particularly in early years classroom. It will
contribute to the society of knowledge to understand how early years classroom can be transformed and what are the supporting factors through which success is possible. In Pakistani context, this research will open doors for other researchers to investigate the area of technology integration in early years classroom when we are less focused in developing this significant milestone in children’s lives.

1.6. Research Questions

Following are the research questions which were intended to investigate through qualitative method,

1. What are the perspectives of teachers and parents towards integrating technology in early years classroom?
2. How does the school promote technology-based teaching in early years classroom?
3. What are the supporting factors needed to promote technology-based teaching in early years classroom?
4. To what extent does technology contribute to the social development of the child?
5. What are the challenges faced by teachers, students and parents to incorporate technology in the teaching and learning process?

1.7. Research Hypothesis

The following alternative hypotheses were developed to collect the data.

1. There is a significant difference between the cognitive development of the students in traditional teaching and technologically enhanced teaching in early years classroom.
2. There is a significant difference between the social development of students during pre and post intervention in early years classroom.

1.8. Operational Definitions

1.8.1. Traditional based teaching

Traditional teaching refers to specific learning environment where teacher as a controller of the class plays the role of decision maker in terms of curriculum and content and also works as an informer through lecture techniques (Novak, 1998).
1.8.2. Early Childhood

Early childhood, defined as the period from birth to eight years old, it is a time of remarkable growth with brain development when it happens at its peak. During this stage, children are highly influenced by the environment and the people that surround them (UNESCO, 2015).

1.8.3. Early Childhood Education

Early Childhood Education (ECE) aims to prepare a child holistically. At the time of early years learning, child’s social, physical, cognitive and emotional development is necessary flourish for lifelong learning and strong foundation (UNESCO, 2015).

1.8.4. Technology

Ramey (2016) defines that technology is a means to process and create various products with the help of systematic pattern by using any technological system with our extended abilities.

1.8.5. Technology Integration in Classroom

When students are exposed to the use of a variety of tools in teaching and learning process using technology, like Multimedia, mobile phones, tablets, iPad, computer and other gadgets for the purpose of getting knowledge is called technology integration in classrooms (Edutopia, 2007).

1.9. Methodology

This research focuses on the aim to identify the effects of technology in students’ cognitive and social development in classroom. Among numerous research techniques in social sciences, this research is profound with a mixed method experimental research design. In the quantitative part experiment was conducted with two different approaches: Traditional and technological teaching. In the process of collecting data purposeful manipulatives and controlled variables were taken into consideration to understand the cause and effect of two variables (Franekel & Wallen, 2012). This study consisted of independent variables such as teaching methodology and learning resources while dependent variables may include students’ performances or achievement, social behavior and learning abilities. Quantitative data was compiled with the help of mid-term and annual assessment
results of the students and also classroom assessment results which were carried out at the time of experimentation. A time bound observation checklist was also given to the teachers and parents to gauge the implications of technology-based teaching on students’ social development. The qualitative research method helped the researcher to get the data triangulated through maintaining anecdotal records and semi-structured interviews. Qualitative research is a kind of inquiry-based research through which a researcher gets to understand the “best practices, beliefs and values of individuals who were engaged in activities in their socio-cultural context” (Yin, 2013, p. 322).

1.10. Organization of Thesis

This thesis is comprised of five chapters. Chapter one introduces study, integrating technology in early years classroom: Voices of parents and teachers with in-depth background information followed by context, problem, rational, significance, research questions, hypotheses and definition of key terms mentioned in the study. Chapter two describes the vast knowledge of research conducted at a national and international level with reference to this study to create the theoretical background for the research community. Chapter three follows research design, data collection process including sample and sampling procedure, data analysis, ethical consideration and limitation of the study. Chapter four develops real understanding of the empirical data in the form of research findings, analyses and discussion. Chapter five compiles the study under the heading of conclusion and recommendations for policy makers, school leaders, teachers and parents.
2. CHAPTER TWO: LITERATURE REVIEW

2.1. Introduction

This chapter determines a thorough literature review which was carried out to understand the in-depth research analysis from a national and international point of view regarding early childhood education, its background and theory and its relation to 21st century classroom skills. This creates a connection to build relation from the need of the research to the importance and its implications on early years teaching and learning process. Further, the chapter refers to numerous studies to define the theoretical framework which revolves around two main ideas: Piaget’s theory of constructivism and Vygotsky theory of socio-cognitive development. In the later part, gap analysis describes the need of research with reference to the education system of Pakistan. The chapter also highlights the importance of technology in early years classroom and its impact on students’ cognitive and social development. Next, it elaborates and discusses the structure of the conceptual framework of this study with the context to research study.

2.2. Early Childhood Development (ECD)

ECD refers to the “comprehensive approach to the policies and programs for the children from birth to eight years of age, their parents and caregivers” (p. 2). The purpose of concentrating ECD is to offer the child his rights for the development of his/her cognitive, social, emotional and physical abilities. Early childhood development is the key to a successful and productive life, not only for the individual but also for the nation as a whole. It is the period, when a child is going through the developmental phase that helps to form the foundation of his well-being and learning. Failure to provide sufficient and optimal developmental experiences can become the cause of delay and disability in the child’s behavior and performance. Research informs that early childhood interventions by the age of four can have a lasting effect on intelligence, personality and social behavior of the child. Therefore, those integrated programs which are introduced during this time are critically essential for their mental and psychosocial development (UNICEF, 2014).

2.3. Learning Theories in Early Years

Child development at early years concern with numerous areas which help to understand the factors needed for bringing up the child with uniqueness, character building, attitudes, values and skills in order to gain the process of dealing with the issue of nurturing (Beckley, 2012). There were different
philosophers who pioneered the learning theories of child development, later those perspectives became pathways for other people to understand the impact of theoretical perspectives within the context at its application level. This study was developed around some theoretical perspectives of child development. This research is influenced with the perspectives of Piaget’s theory of constructivism and Vygotsky theory of socio-cognitive development. These theories are further elaborated with the perspective of classroom practices and learning experiences on students’ development.

2.3.1. Theoretical Framework of the Study

Figure 1 proposed theoretical framework for this study. It has been developed using cognitive and social learning theories. David, 2015; Piaget, 2013 state that constructivism is a process of contextualizing the ideas based on knowledge and experiences. Construction of knowledge is based on the learner’s previous knowledge, regardless of how one is taught. Vygotsky (1980) felt social learning precedes development. He further states that “Every function in the child’s cultural development appears twice: first, on the social level, and later, on the individual level; first, between people (inter psychological) and then inside the child (intra psychological)” (p.34). His theory promotes that the role of the teacher and student is shifted in order to help and facilitate meaningful construction in students; therefore, it becomes a reciprocal experience for the students and teacher (Vygotsky, 1980; Moll, 2013).
2.3.2. Constructivism

Woolfolk (2010) states that the theory of constructivism emerged with an idea of how people extract meaning from context based on their own understanding as well as interaction with others. The role of a learner according to this theory is particularly connecting to the prior knowledge with the social interaction to generate new knowledge through understanding rather imposing. This theory has been rooted in the tedious research work of Jean Piaget, Jerome Bruner and Lev Vygotsky. Constructivism can be viewed from cognitive development and sociocultural theory. Piaget believes that learning is an active process, therefore; construction of knowledge takes place in stages. When children get a chance to start interacting with their environment, they seem to be involved with different mental structures. As a result, it forms a foundation to enter into complex thinking and learning (Jalongo & Isenberg, 2012). Bruner (1966) on the other hand defines learning as computer. He elaborates that learning occurs as much from the “outside in as from the inside out” (p.152). According to him, learners in their active roles organize the information into complex and higher categories, then they modify the information according to their own understanding, however it makes sense to them. Theory of constructivism leads a direction towards many ideas, out of them some ideas are presented to get a clear understanding of links to this research. Cognitive development, stimulation in learning, reducing direct learning and connection of content with the real world set examples of how learning occurs in classrooms through meaningful theories.

Cognitive development defines how the child “thinks, learns, acquires concepts, remembers, understands relationship, solves problem and make a sense of the world to construct meaning out of it (Beckley, 2012, p. 25).” The rapid development of a child’s brain starts in the prenatal stage and continues till after birth. Early childhood is a crucial period when brain maturation connects its pathways for the progressive development of the child’s thinking and learning ability. During the time of cognitive development, environment plays a role of connecting wires of neurons to enhance the potential of intelligence and behavior through stimulation. Scientific research informs that if the process of brain development does not receive enough stimulation during this critical period, then it would be difficult for the brain to rewire itself in the later age (UNICEF, 2014).

With the perspective of cognitive learning development concept of teaching and learning fundamentally changed the phenomena. Numerous research has been done to describe the effectiveness
of the theory of cognitive development into real classroom practices. Some findings present here to get the clear understanding of its outcomes. Developing stimulation in classrooms promotes the ability of discovering, taking initiatives, conducting experiments and inquiring for reality through using concrete materials by enabling curiosity to learn more (Beckley, 2012). Involving students in dialogues, asking them relevant questions, giving them a chance to think and exchange their ideas enhance their learning to find out reasons by stimulating their thinking (Cervoni, 2011). Theory of constructivism supports the idea of connection of content with the real-world life experiences. When children are involved in performing some activities and those activities are linked with their prior knowledge they make new connections through their current understanding (Beckley, 2012).

Constructivist viewed this idea from teaching and learning process which determines how a child is involved in using active learning techniques to experiment and practice real-life problems. This helps a child to create a new knowledge and reflect back to his/her practices for clear understating. The role of a teacher in this scenario remains as a guider who allows students to enjoy concept building on preexisting concepts (WNET Education, 2004).

2.3.3. Social Learning

Social learning theory determines learners as active participants of the society, they make a strong observation and create their own learning patterns or model others. It has a connection with cognitive influence of a child to identify the pattern of learning. It also describes the role of a child’s role models just as parents, teachers, peers or other essential member of the society to influence their language learning, state of aggression and its dealing ability, emerging moral sense and learning socially through accepting different behaviors (Bandura, 1997). Early years classrooms are the best place for social interaction in which students get the opportunity to interact with the teacher, teacher also get opportunity to interact with the students and students are also observed to talk to the objects while performing task (Cervoni, 2011). In classrooms, social learning helps a child to develop appropriate behavior with others for their own learning (Bandura, 1997). Jalongo and Isenberg (2012) identified effective practices to apply the social learning in the classrooms i.e. “model appropriate skills and behavior, promote self-efficacy, view children as active learners and promote opportunities for self-regulation” (p. 150-151). Vygosky in his theory of sociocultural emphasizes on zone of proximal development (ZPD) and scaffolding. As per his theory, relation of a child with others shape their
personality. A healthy communication between a knowledgeable person and the child with the help of dialogue stimulates their process of thinking to frame the later communication. He suggests that learning primarily happens at a social level and then at an individual level.

Vygotsky believed that individual cognitive development can only be done through a social process which helps a child to shape the abilities in a social environment (Keenan, 2002). He further builds on his idea through describing the Zone of Proximal Development (ZPD). ZPD is a bridge to reduce the gap between the instructions and interaction with knowledge supported by peers or adults. It helps children reach to their potential rather to the point where they reach (Beckley, 2002). To enhance the level of understanding of the child it is important to provide them with little advanced learning experiences which then help him/her to inquire and investigate complexities through self-initiatives. ZPD allows a teacher to assist a child by identifying his/her needs and motivate them for practicing the skill with a little more effort (Jalongo & Isenberg, 2012).

Jalongo and Isenberg (2012) state that mix ability groups provide opportunities to the children to learn through “think, pair and share” (p. 154), verbal exchanges through “multi-student project and centered-based learning” (p. 154) allow learner to negotiate and solve problems together. Group learning capitalizes the social aspect of learning through involving students in some meaningful and cooperative learning experiences. With every new learning children need to get themselves enchanted with that concept through introducing background, coaching, providing them with the feedback and probing questions to get the clarity. Children can also be given opportunity to learn independently if they are more capable of doing the things individually. In this regard, the role of a teacher is to allow them to choose projects or task on their own and seek for help when they feel it is required (Jalongo & Isenberg, 2012).

2.4. Importance of Learning Theories Early Childhood Education

It is very important to take measurable steps to improve national early childhood education, this alone is not sufficient to support the learning and development of young children. Providing high quality early childhood services are essential and required; therefore, there is an urgent need to increase in the number of schools to reduce the issue of accessibility and a need to work on the quality of services provided in early years schools (Ivrendi & Isikoglu Erdogan, 2015; Zembat, 2007). A substantial body of research stated that the quality of early childhood education programs improves the
developmental levels of children (Burchinal, Vandergrift, Pianta & Mashburn, 2010; Duyar, 2010; Feyman, 2006; Sylva, Siraj-Blatchford, Taggart, Sammons, Melhuish, Elliot & Totsika, 2006). There was a rigorous and sophisticated longitudinal study mentioned that high quality early childhood education improves a child’s overall development (Ishimine & Tayler, 2014). Specifically, Barnett (2008) stated that higher program quality is associated with larger gains in cognitive and language abilities. Several other studies indicate significant correlations between the quality of programs and children’s cognitive, language, socio-emotional and psycho-motor development, early academic skills, and school readiness levels (Burchinal, 2010; Pianta, Barnett, Burchinal & Thornburg, 2009). A recent study has also documented that classroom quality is well associated with better academic performance (Rudasill, Hawley, LoCasale-Crouch & Buhs, 2017). Similarly, a number of studies have revealed that high-quality early childhood education improved the academic success of children later in life. High quality early childhood education has especially long-term positive effects on the primary school years as it promotes children’s social and academic skills (Broekhuizen, Akena, Dubasa, Mulder & Lesemanb, 2015; Mokrova, Broekhuizen & Burchinal, 2015).

Through the empirical study, it has been found that the investment on early childhood education promotes the productivity in the later-life skills and called as “dynamic complementarity” (p. 13). This term refers to the implications that occur at the time of later life experiences as a form of achievements due to investing skills and resources during early life. This feature arises as a complementarity incentive which appears with the wise decisions and efforts made through early-life investment rather than that at later ages in adolescents who lack a strong early base, having less productive results (Elango, García, Heckman & Hojman, 2015). UNICEF (2014) shares the findings of some research in its report and informs that “ECD stimulates children’s desire and ability to learn, and thereby can increase the return on investment on education by reducing repetitions rates, increasing school readiness and making the education more effective (p. 10).”

Research studies mainly support the idea of investing skills, knowledge and resources at the time of early years education because of its retention for later life and enhancing children’s ability to be competent and ready for the upcoming challenges.

2.5. Challenges in the Contemporary World in Early Years

Research highlights that this world is interconnected with problems as collective consciousness. This problem settles our stimulation with uncertainty and change. Education standard at early years is
becoming crucial to make a hub between the contextual reality and global effects. Parents and practitioners strive for the best outcomes through numerous patterns (Beckley, 2012). With the subject to globalization, literature argues how to prepare early years children for future challenges (Lauder, Lowe & Chawla-Duggan, 2008). Another argument found in the literature is how to prepare children for striving the best. The next issue talks about the environmental concerns, failure in fostering international links through technology and other resources. It is important to get ourselves linked with international standards of teaching and learning to meet the level of global competence and collaboration (NPQH, 2006).

Students in today’s world are valued with their individual capacities and to reach to their capacities it is required to identify their individual needs. Quality of education opens a forum to meet learners’ diversified needs and provide each individual with opportunities to explore to the demand of global society (Lauder, Lowe & Chawla-Duggan, 2008). Clark and Waller (2007) claim that “might there may be a dichotomy between the ideology of improving early years education and surviving with the contextual needs” (p. 14).

The global demand for early years children is to meet the 21st century skills through exploration, problem solving, meeting to the individual needs and working on the digital literacy through collaboration and coordination with international learning community. This requires a shift of our mind sets and practices from traditional-based instructional techniques to the student-centered classrooms.

2.6. Paradigm Shift of Traditional-Based Teaching to Student-Centered Classroom

Nyisztor (2015) informs that the evolution history of early childhood education reveals the dichotomies regarding perspectives of children’s learning and thinking abilities. This research also argues how children should be taught; through developmental approach using child centered method or only focusing on the subject area content in isolation. To understand it further, Dewey (1963) well stated that, “the child is the starting point, the center and the end” (p.9). The most preferable method of teaching and learning process presented by the researchers is a child-centered approach which includes the roots of constructivist theory that transforms a child’s thinking ability with the construction of knowledge. On the other hand, teacher-centered or didactic approach highly criticized in the contemporary literature (Stipek, 2002; Katz, 2003; Hyson, 2003). Goffin and Wilson (2001) believed that theory of development should become the primary legitimacy of early childhood which determines
the clear understanding of those instructional methods which lead children to its application level. According to Hyson (2003), “the most effective early childhood classrooms nurture both children’s academic skills and their social and emotional development” (p. 20).

Hence, paradigm shift in education referring to the child-centered approach which is relevant to their experiences which occur at the classroom level and its application to their real-life setting. Furthermore, authentic literature supports this idea also with the relevancy of curriculum and the planning to execute it at particular level.

2.7. Curriculum in Early Years

Curriculum in early years is a matter of concern not only for the teachers, while it is the responsibility of all the stakeholders including the state that believes that one of the ways to bring success to the nation is improving the quality of young children’s education (UNESCO, 2005; NAEYC, 2003; UNICEF, 2014; Ministry of Federal Education and Professional Training, Islamabad Government of Pakistan, 2017). Gestwicki (2014) asserts that educational practices in mainstream is a result of the direction and orientation of theories and research which has continued from forty years. He further elaborates that curriculum in early childhood education involves decision regarding, “what will be taught and how it will be taught” (p. 65). This dynamic and evolving idea has become a part of current knowledge and invites the best practices globally which has a direct impact on social, economic and political development of the country. Gestwicki (2014) believes that “early childhood educators create curriculum for learning in the early years by developing their understanding of how that curriculum should be created” (p. 65). This can further be clarified with this understanding that, the curriculum is a document which is the collection of experiences, observations and experiments to test theories and verify results from practices.

Curriculum development requires both, an in-depth knowledge of children and an application that considers what is meaningful for children’s learning and development. National Association of Early Childhood (NAEYC) (2003) describes that, an effective curriculum is planned in such a way that it helps learner make meaningful connections for rich conceptual development and focusing on the subjects according to the validity of time. Literature from different contexts considering the need of meaningful connections in the form of integrated curriculum in which various subjects like science, mathematics, literacy, social studies, arts and technology allows children to participate in mental connection without any artificial separations (Katz & Chard, 2000; Chard, 2005; Helm & Katz, 2001;
Hartman and Eckerty, 1995, Bredekamp & Rosegrant, 1995). Integrated curriculum creates coherency in a child’s experiences and permits “optimum construction of meaning” (p. 67), it encourages learner to apply the gathered knowledge into broadly relevant experiences (Gestwicki, 2007).

Smith and Killen (2013) researched to identify how a curriculum design can be improved with the use of technology to meet the diverse needs of the students to enhance the 21st century skills. They found that technology integration in curriculum encourages students to develop digital skills and practices which is associated across the institutions of the world, it provides support to individuals in terms of working on their own capacities to drive the best route to show case digital literacy, it develops students as change agents having skills of communication, flexibility and eagerness for sharing and learning experiences.

2.8. Technology in Early Years Classroom

Technology is viewed as a tool for learning in early years classroom, then it is considered as a potential strategy to enhance students’ social and cognitive development. A concrete example of social development is when children involved in activities during technology-based teaching share leadership roles and initiate interaction more frequently. They keep asking questions and trying out different activities with greater enthusiasm (Kleiman, 2000). Use of technology in early years classroom refers to different dimensions of learning which are also supported by various empirical studies; use of photobooks in science activities motivates students’ involvement as active participants (Katz, 2011); use of computers in classrooms for learning purpose effects on academic performance of the students (Judge, Puckett & Bell, 2006); rapid development of technological tools are building learners as new millennium digital natives (Xiaoqing Gu, Yuankun Zhu, & Xiaofeng Guo, 2013); digital story telling found as a powerful tool for teachers and students to engage them into critical thinking and dialogues (Robin, 2008) and Pellerin (2013) found that the use of technology supports the idea of inclusion into instructional strategies by allowing learners to represent the idea through different ways, modify the actions and expressions as per the level of understanding and design activities which can engage students effectively.

2.8.1. Technology: A Tool for Learning

Technology in the classroom can bring a variety of opportunities for the learners through which they can learn information about the world outside of the classroom in a simple click. Teachers can introduce action-oriented activities which can enhance students’ reading and cognitive development
with an almost endless source of options. This kind of practice opens vast doors for leaners to explore and learn through inquiry-based experiences. It also helps students to get the information from diverse culture, work with each other and access numerous pictures, collections of videos and different kinds of sound (Willis, Weiser, & Kirkwood, 2014). Oxford learning center (2011) found that some schools are following the model of flipped classrooms in which students go through with the experience of listening and watching educational videos via You Tube. Schools make it their practice that students at home also use the idea of flipped classrooms and complete their homework which is basically designed according to their level. They believe that traditional based practice can only make students passive learners and does not invite students to participate in any kind of academic challenging activity.

Educators and other educational professionals tried to develop awareness and acceptance of technology in education with the new meaning that is how it becomes effective when it is used for instructional practices. NAEYC and Fred Rogers Center (2012) set some principles to promote technology-based teaching in classroom and concluded that,

1. Technology can enhance students’ cognitive and social abilities.
2. Technology integration produces positive result when it is interlinked with environment, curriculum and daily life activities.
3. Technology reduces the gap between home-school connections.

These define the guiding principles which are not only reserved for the developed nations of the world, but also stand true, for developing countries, like Pakistan. Use of technology has also been mentioned as use of ICT (Information Communication Technology) in many literatures which present the overview of the possibilities for young children education (Bolstad 2004; Clements and Sarama 2003; Kalas 2010; Siraj-Blatchford and Siraj-Blatchford 2005). These possibilities are further described as activities like playing in young children, education led extra dimension with the help of using technology. There are different ways through which children can be involved in realistic and imaginative socio-dramatic role play using technology, they use different form of vocabulary and instructions to program their understanding (Bolstad 2004). Secondly, technology can contribute to both the language development and mathematical thinking of young children, through easy transitions between words and pictures and practice software, drawing programmes or computer manipulatives (Bolstad 2004; Kalas 2010). Further, technology can provide unique opportunities for scaffolding and supporting children with special learning needs, or children from culturally or linguistically diverse
backgrounds (Bolstad 2004; Kalas 2010). Next, when technology is used in spontaneous learning and playing in the classroom, it can be a catalyst for social interaction (Clements & Sarama 2003), although adult guidance is often needed to gain the most from technological environments (Kalas 2010; Blatchford, 2005). Wood (2008) acknowledges the motivational aspects of technology. The speed, colors, dynamic presentation and instant feedback attracts children. This illustrates that technology offers multiple possibilities and can be embedded in early childhood education in many divergent ways.

Roswell (2014) finds that the use of websites provides opportunities to the children to view and read the text multiple times with different modes. Visual presentation of the text interactivity through suing eBooks which are sometimes also available in audio. This helps different kinds of learners to accommodate themselves and get benefit out of the presentation of the text. In one of the longitudinal studies, researchers inform that literacy development occurs with success and convenient in young children as technology allows them to make posters, create discussion forums, unfold unfamiliar applications and story re-telling sessions for creative “multimodal” (p. 23) practice (Dezuanni, Dooley, Gattenhof, & Knight, 2015). There are different options as educational applications which are designed to promote educational games in accordance with age appropriate topics. They are interactive, challenging, enhance player skills related to decision making; moreover, they offer rewards like certificates and stars for the players so the student can take more interest (Neumann & Neumann, 2013).

Literature from the different context highlighted theoretical perspectives and its possibilities for the level of application in early years classrooms; however, the identified need for this study (See Chapter 1) proposed to understand the education system of Pakistan specifically with the perspective of early childhood education and preparing those children for 21st century skills as mentioned in SDGs 2030. In the next part of this chapter, a brief background is discussed regarding the education system of Pakistan and by looking at the scenario conceptual framework of this study is also presented to fill in the gap which is identified through literature and proposed because of its relevance with the context of the study.

2.9. Education System of Pakistan

Education is a systematic process of establishing the pillar of the society. It plays a very important role in the progress of any country around the world (Iram, 2015). Early Childhood Education (ECE) is a branch of education theory which relates to the teaching of young children (formally and informally) up till the age of about eight years. It’s the time of remarkable brain growth, these years lay the
foundation for subsequent learning and development (UNESCO, 2007). Various researches have proved that the first few years of life are particularly important for the development of the child. Development of all domains and learning occurs faster in these years than that of any other part of the life (Barnett, 2008; Hartle & Berson, 2012; Hunzai, 2007).

UNESCO (2007) informs that people in the 6th largest country of the world are unable to get the basic education. The main challenge for the implementation of ECE in Pakistan is that the negative impact of limited access to education and its poor quality is disproportionately born by poor and marginalized children as well as families surviving in poverty tend to focus on keeping fed; rather than education. Other developmental domains such as psycho-social, emotional and physical skill are mostly neglected. Same as, early years are significantly important for cognitive abilities and the development of the brain capacity of a child as well (Iram, 2015; Syed, Asif & Yousaf, 2011). Education at early years is the most important issue which is highlighted in many researches with the consistent focus on developing all learning areas to make children valuable citizens and globally competent (Hunzai, 2007). Ahmad (2011) stated that, Pakistan has to overcome the issue of “wider participation, better quality of teaching, improved governance and bridging gap with global competency” (p. 89) as substantial need for the country. In early years education context, basic need of children is to study in the favorable environment which is unfortunately being neglected in most of the school settings. Policies and implementation plan are full of theoretical material, while practices have failed to apply those strategies into a real classroom setting.

Research has shown that if a healthy environment is provided to the children, they can learn at a faster pace. Teachers play an important role in the whole process. They must be familiar with the concepts of teaching young age groups and should have sound qualification to fulfill the learning needs of children. If teachers are familiar with the principles of love, kindness and care, they can easily teach students at primary level with the help of different pedagogies. However, professionally more trained people can educate the people to build a good nation. For building children’s ability according to the 21st century skills it is necessary to build a connection between the global demand and reducing contextual disparity to get successful achievements.

Literature from different contexts advocate the importance of technology-based teaching with the development of skills like literacy, writing, communication, social behavior, collaboration, comprehension, reflective practice and play (Parette, Blum & Quesenberry, 2013). Skills which children
carry through technology use are considered as a current stock of skills that can help individual over the life-cycle which has a great impact on the future generation. The dynamic relationship between the future skills and its use for the meaningful purpose lays foundation for a challenging life ahead (Elango, García, Heckman & Hojman, 2015). Southern Early Childhood Association (2008) describes that, use of technology in our world is connected significantly with children’s life style; just as using ATM, paying scanned bill at super market or clicking the button on microwave to heat the food. They also believe that technology use in early years classroom is a powerful tool; therefore, it should be integrated into all the components of the curriculum rather than a single part. This practice is somehow missing in ECE setting. Due to this reason children from different family background remain passive to understand the productive use of technology at home and also in classrooms. The reason behind this issue is the misuse of technology while promoting irrelevant activities that make no contribution towards cognitive and social development (Scoter, Ellis, Railsback & Northwest Regional Educational Laboratory, 2001).

Rich (2018) mentions that the best contribution to improve education system in the country is combining forces of home, school and community. She further informs that it has been two decades that parents’ involvement has somehow been ignored in the discussion of students and the nation’s successes, both individual and as a whole; however, that is the most important issue because it is considered that, the role of a parent in children’s life stays as a significant educator.

2.10. Conceptual Framework of the Study: Building on the Research Need

Literature emphasizes on the importance of social interaction of young children with their caregivers (parents, teachers, siblings and guardians) to solve their issues and scaffold their linguistic and reflective capabilities (National Research Council, 2000). Some studies also elaborate that children actively participate in social learning environment through interaction and establish social networks. Carter Ching, Wang, Shih and Kedem (2006) advocate that many early childhood researchers, educators and parents express negative opinion as they believe that “frequent use of technology at a young age can lead to isolation and lack of opportunities to develop children cognitively and socially with peers and adults” (p. 348). However, ISTE (2017) provides a framework for leaders, educators and students to rethink education from the perspective of global standards. Their guidelines focus on reforming teaching and learning from a factory model to the education of technology. Willis, Weiser and Kirkwood (2014) found that the integration of technology helps educators teach children about exploration, creation, problem solving, communication, collaboration, documentation, investigation and
demonstration their learning happen in the classroom and outside the classroom. National Association for the Education of Young Children (NAEYC) (2016) suggests that it is important for teachers to evaluate technology-based tools with regard to the appropriateness and quality of the content for young learners. Children with early years learn through hands-on experiences; therefore, it is pertinent if they are engaged with valuable activities through which they are connected with their surroundings and the rest of the world.

National Association for the Education of Young Children (2012) describes that the role of technology is to build skills and interest among children to become globally competent and literate so that they can serve tomorrow as valuable citizens for their country. The International Education Technology Standards (ISTE, 2007) indicate that in order to be a competitive workforce, children need to acquire basic skills in technology by the time they are five years old. For children from affluent families, with full access to technology, these skills are highly developed by the time they enter school, but for children from less affluent homes, the ability to develop technological skills typically occurs in the school setting (NAEYC, 2012), which may not be the case in developing countries.

Figure 2 demonstrates the conceptual framework of this study proposed by the researcher keeping all substantial factors into consideration to experiment the concept of using technology in early years classroom through meaningful activities by involving students with new experiences of learning. This study also evaluated the difference between the outcomes gathered from traditional teaching methodology with technologically enhanced teaching to create a theory, building upon the collected data during the research process.
2.10.1. Conceptual Framework of the Study

The above framework shows the clear focus of investigating teaching traditionally and technologically in an early year classroom. It has been formed with the help of literature review which supports the idea of this research and also helps the researcher to identify the relationship between changes in behavior, comprehension skills and application skills of students after using two different methods in the similar group settings.

2.11. Summary

In a nutshell, chapter two describes the theoretical understating of constructivism and social learning in early childhood development. Both the theories were linked with the needs of 21st century skills that is to develop technological use and understanding of students during the high time of learning which is between 0-8 years of age. The need of a research specifically determines the misuse of technology within the context of Pakistan due to the lack of awareness and considering ourselves not
accountable for the development of young children. The proposed theoretical and conceptual framework mainly highlights the possibilities through which children can learn and as a result their behaviors and achievements can easily be monitored through their performances. In the next chapter, research design and its framework are discussed to get through with the experience of the data collection procedure and its analysis.
3. CHAPTER THREE: METHODOLOGY

3.1. Overview

In chapter one, the researcher introduced the research with the background and context of the study. The idea was further built with the help of a problem statement, rationale and significance of the study. In the later part of the chapter, research questions and hypotheses were defined to get the clear understanding of research intention. Chapter two comprised of thorough literature review and presented theoretical framework of the study with some relevant theories of early childhood education. The chapter defined the significance of technology integration in early years classroom, along with the contextual reality of our country. It further discussed the need of the research followed by the conceptual framework of the study.

3.2. Introduction

This section presents the research methodology which was applied to this study for collecting, analyzing and synthesizing data. It gives a detail structure of research design and the rational for adopting the methodology. In this chapter, researcher highlights the data collection process in terms of developing tools and getting them verified from experts. Later part, reflects upon the process of collecting data and the way the results were analyzed to compile the conclusion. In the end, the chapter discusses ethical considerations and limitations of the study.

3.2.1. Purpose of the Study

The purpose of the study was to experiment the difference between the outcomes gathered through traditional teaching and technology-based teaching in early years classroom. This study focuses on the cognitive and social development of students in both the scenarios and evaluated outcomes at the time of practicing activities, interaction with others, changes in behavior, response to the open-ended tasks and application level of discovery-based activities. It helped the researcher to understand the perspectives of parents and teachers regarding the application of technological-based teaching and their observation to this approach. This study further investigates the motivation level of teachers and also to understand the supporting factors related to this approach. To fulfill the research desire and need, researcher developed two alternative hypotheses and five research questions which were tested to assimilate the outcome of the study.
3.2.2. Research Questions

Following are the research questions which were developed to investigate the qualitative data,

1. What are the perspectives of teachers and parents towards integrating technology in early years classroom?

2. How does the school promote technology-based teaching in early years classroom?

3. What are the supporting factors needed to promote technology-based teaching in early years classroom?

4. To what extent does technology contributes to the social development of the child?

5. What are the challenges faced by teachers, students and parents to incorporate technology in teaching and learning process?

3.2.3. Hypotheses

There were two alternate hypotheses have been developed to analyze the results of this research after the experiment,

1. There is a significant difference between the cognitive development of the students in traditional teaching and technology-based teaching in early years classroom.

2. There is a significant difference between the social development of the students during pre and post intervention in early years classroom.

3.3. Research Design

This research is conducted using a mixed method experimental design which helped researcher to collect and analyze the data with the guidance of qualitative and quantitative research methods (Creswell & Clark, 2018). The purpose of selecting this design for the study was to understand, how the participants of the research experienced the intervention; what were the mediating and moderating factors; what were the barriers and facilitating factors during the intervention and how did the resources create impact the performance of participants (Creswell, Fetters, Clark & Morales, 2009). Quantitative method was used in this study to gather empirical data and qualitative method applied to collect in-depth information related to the topic (Rizvi, 2004). Mixed method research design provides a pragmatic worldview; therefore, it allows researchers to involve, combine and integrate data with open-ended responses, that is, qualitative and also through close-ended responses like questionnaire and
assessment results, that is, quantitative to get to the conclusion. It was found in literature the mixed method design neutralizes the weaknesses of data (Creswell & Creswell, 2018). According to Teddlie and Tashakkori (2003), mixed method allows and open doors for the researcher to research the confirmatory and exploratory questions and later verify it to form a theory from the same study.

This method of research provides an opportunity to the researcher to address research problems and infers the relevant meaning through the divergence of experiences and opinions. As a method, it focuses on collecting, analyzing, and mixing both quantitative and qualitative data in a single study (Creswell & Clark, 2011). Hence, this study provides a better understanding of research questions and its implications on early years children.

Within the paradigm of mixed method, this study follows a form of convergent mixed method design in order to deal with a comprehensive analysis of research problems. In this design, the role of investigator depicts as collecting both forms of data at the same time and interpreting the research findings as an overall result. In case of identifying any contradictions in findings, it was further probed to the participants to arrive at the conclusion (Cresswell & Creswell, 2018). Morse (1991; 2003) also indicated this process as QUAN+QUAL in which researcher was able to use qualitative and quantitative strands at the same time, which later helped to combine the results of the different strands with the convergent design.

Quantitative research method in this study, helped the researcher to quantify the data with the help of experimental design. Saleh (2006) stated that quantitative studies “underlay the deductive models that confirm hypothesized relationships or consequences of the relationships” (p. 78); therefore, within the quantitative approach, experimental design was employed to investigate the implications of integrating technology in the process of teaching and learning in early years classroom. Field and Graham (2003); Fraenkel and Wallen (2012) describe that, experimental study allows researcher to understand the relationship between two entities in natural setting as well as in manipulative setting, in which participants were allowed to go through with the phenomena which further applied to investigate the outcomes of the research. Experimental research study is influenced by the scientific field of study in which it provided a chance to the researcher to bring innovation to the learning process, conduct experiments to test the results and compared controlled learning outcomes with experimental learning outcomes to determine its effectiveness on the cognitive development of the students (Brown, 1992;
Collins, Joseph, & Bielaczyc, 2004). This study indicates manipulation process of independent variables as teaching methodology and teaching and learning resources using technology; while dependent variables include social skills, cognitive skills and learning outcomes in the form of nature of intervention and its application (Fraenkel & Wallen, 2012).

Researchers supported experimental design as an ‘excellent’ method in “determining cause and effect where researchers can interpret the data beyond description and beyond correlating variables (Field & Graham, 2003; Mujis, 2004; Gorard, 2003). In this study, participants were assessed through specific treatment (teaching using technological tools) to one group and concealment of it from another group (teaching using traditional approach) to determine the difference in both the groups’ outcomes (Creswell & Creswell, 2018). In relation to this study, experimental design determines the focus of the research to test the hypotheses with the help of two different teaching methods and also the way those methods influenced intended outcomes.

Qualitative research embraces a variety of methodological approaches with “different disciplinary origins and tools” (Lingard, Albert, & Levinson, 2008, p. 459). Within the qualitative research method, this study revolves around an inquiry approach which was used to derive theory with the help of “process, action and interaction grounded in the views of participants” (Creswell & Creswell, 2018, p. 13). Qualitative method of research in social sciences appreciates active engagement, typical involvement and presentation of intensive experiences from its participants (Mason, 2002). In this study qualitative data was interpreted based on how people comprehend their experiences in relation to the use of technology with early years children and what meanings they derive from their personal experiences (Merriam, 2009). That is the foremost reason that within the mixed method experimental design, qualitative research method plays a role to provide opportunity to the researcher to gathered the research data through participatory approach and maintained the role of researcher as reflexive in the whole process (Mason, 2002).

In the light of Creswell and Creswell (2018) this study follows a complex mixed method strategy in which the overarching result of quantitative and qualitative studies formulated a deductive approach for identifying results through the phase of experimentation with intervention and also through interviews and observations. The research design facilitated the researcher to idealize the detail understanding through diverse source of data (Creswell & Clark, 2018). In this study, equal opportunity was given to
both the methods as integrating technology in teaching and understanding the perspective of teachers and parents regarding use of technology in early years classroom.

3.4. Research Design and its Philosophical Assumption

This research follows the pragmatism philosophical assumption. Tashakkori and Teddlie (2003) define that mixed method research is typically associated with pragmatism because of the final worldview considering by a large number of scholars. The focus of this study is oriented with pluralistic idea of experimenting technology in the early years classroom and identifying the perceptions of the stakeholders with reference to the classroom teaching and its outcomes on students’ cognitive and social development. Creswell and Clark (2018) also associated mixed method convergent design with the philosophical assumption of pragmatism, because with involving data came from two different dimensions and merging together with the large understanding.

3.5. Rationalizing Research Design with the Problem of the Study

Use of technology in educational context depicts different positive dimensions through which one can meet the demand of being globally competent and connected with the knowledge of society (Tinio, 2003). With the context of Pakistan, use of technology still remained a question between its advantages and disadvantages. The reason for this dilemma is the misuse of technology without any support and guidance, lack of efficiency in demonstrating the proper use and rigid mindsets of stakeholders to understand its use for educational activities (Syed, Asif & Yousaf, 2011). Furthermore, early years education is a crucial time for the children when most of the learning occurs; therefore, research from different context and Pakistan curriculum of early childhood education (2007; 2017) suggests to incorporate 21st century skills in young children which also includes the use of technology in an educational setting (Willis, Weiser & Kirkwood, 2014; Grant & Mims, 2010; Syed, Asif & Yousaf, 2011). By keeping the effectiveness and need for converting traditional classrooms into technology-based classroom teaching, this study is designed to investigate the teaching styles in two different scenarios followed by experimentation in which the teaching and learning processes were monitored and tested through students’ outcomes for further clarification.

Mixed method experimental design helped the researcher to collect data from various sources and allow the active participation of the stakeholder to witness the experience and observe changes in students’ cognitive and social development by applying experimental strategy. Moreover, this research
is doable and adaptable in relation to the context of school and also from a geographical perspective. Research design further helped the researcher to validate the research findings through different sources (Thomas, 2000). Hence, experimentation with reference to the research setting helped the researcher in determining the relationship between two entities in a certain structured environment, in which both entities got different exposure and conclusions have been made by comparing the outcomes (Frankel & Wallen, 2012). On the other hand, stakeholders (parents and teachers) were also involved in sharing their perspectives and observations before and after the intervention to acquire an in-debt analysis of this research (Merriam, 1998).

3.6. Research Design Framework

The framework below was followed to underpin the importance of the research design. This framework determines how this study was conducted using different steps and how each variable is connected to another variable. It gives clarity to understand the consistency in the data collection process (Gibbs, 2007). Details of each step can be found in the later part of the chapter.

![Research Design Framework](image-url)
3.7. Development of the Research Tool

Development of the research tool was the most tedious part of this research. This process required extensive literature review and analysis of sample tools from different studies. Since the research participants were children aged between 4-5 years; the criteria for assessment, content, skills and length was discussed with teachers skilled with that particular level to ensure validity (Gibbs, 2007). In the baseline assessment, students’ mid-term assessment results were taken into consideration. These mid-term assessment results were based on four major developmental areas; Language and literacy, numeracy, knowledge and understanding, and creative development. Eventually, these areas were catered at the time of developing lessons for the students. At the same time, assessments with each lesson were developed after the validation of the content from the teachers. After the base line study, an interview schedule was developed for the parents and teachers to understand their perspectives in relation to the technology use in early years classrooms. All the questions were open-ended which was derived from literature review, this process helped the researcher to be focused according to the research questions (See chapter two). In addition, social developmental observation tool was also developed which was adapted from Government of Australia Department of Education (2018); National Curriculum of Early Childhood Education (2007) and University of Washington (2004) social developmental milestone. For further inquiry from teachers and parents the same interview questionnaire was used to understand the responses of the parents and teachers after the intervention process. In the end, after two months teachers were asked to maintain the results of the students using baseline study tool to understand the overall development of the students to identify the contribution of this study on students’ progress.

3.8. Instrumentation

In this research, instrumentation was employed to gather the data to identify the importance of technology-based teaching in early years classroom and also to gauge the difference between traditional teaching and technology-based teaching on students’ cognitive and social development. Therefore, for catering to the needs of the research, four kinds of research instruments were used; overall progress report (See Appendix G), assessments of the lesson, observation checklist (See Appendix E), anecdotal records and semi-structured interviews for parents (See Appendix F1) and teachers (See Appendix F2).
3.8.1. Overall Progress Report

With the consent of school higher management (See Appendix C1), Iqra School Progress Report for kindergarten (See Appendix G) was used to determine the students’ progress report before and after the interventional phase. This report comprised for four major areas; Literacy and language skills, numeracy, knowledge and understanding and creative development. Each area of learning determines different milestone and which further examine on the basis of three values; happy face for good performance, neutral face for satisfactory performance and sad face for needs improvement. The purpose of using this instrument in the study was to analyze the baseline progress of the students and progress after intervention to determine the outcomes of the research on students’ progress.

3.8.2. Observational Survey Checklist

Observation checklist (See Appendix E) was developed to understand the social development of students as per the defined milestones. It was developed with the help of proposed social developmental milestones discussed by Government of Australia Department of Education (2018); National Curriculum of Early Childhood Education (2007) and University of Washington (2004) in their studies. This checklist was used to investigate the behavior of the students before and after intervention. There were seventeen milestones related to social development that were taken care of in the observation checklist, which was designed on four Likert scale- never, sometimes, usually and always for further analyses.

3.8.3. Semi-Structured Interviews

In this study semi-structured interviews helped the researcher to gather in-depth data which was compiled with the help of responses of the participants (Merriam, 1998). In the light of the research questions, thirty-five probing questions were developed for the parents and teachers (See Appendices F1 & F2). Those questions mainly focused on the perspectives of parents and teachers regarding integrating technology in early years classroom; role of a school in promoting technology; supporting factors needed for technology-based teaching and learning; technology integration contribution towards social development of the child and challenges for integrating technology in early years classroom. The purpose of using semi-structured interviews in this research context was to explore the experiences with open-ended questions which would not be discovered through structured interviews or surveys (Harrison, 2009; Seidman, 2006). Semi-structured interviews in this research study were considered a
bridge to understand the subjective responses from parents and teachers’ perspective which allowed the researcher to get together the experiences and relate them with the literature.

3.8.4. Anecdotal Records

McNamee and Chen (2005) define that anecdotal records or anecdotal notes are used to determine the observations related to the attitudes of research participants. Such notes inform regarding the learning patterns of the students for future recommendations. Anecdotal records are the running notes which are written usually at the time of ongoing observation which later depicts the performance of students through qualitative inquiry. There are certain guidelines to be considered while writing anecdotal records,

1. Notes were taken immediately for the most accurate observations.
2. Observed individual assistance needs.
3. Observed immediate behavior which could be shared later with the teachers and parents.

Anecdotal records were given opportunity to gather some critical incidents occurred during the intervention. It helped researcher to compile the observations and interpret them for further analysis.

3.9. Sampling Procedure

To conduct this research purposive sampling was preferred. To avoid the factor of extraneous variables criteria for the selection of participants, the characteristics between all the participants remained same (Cook & Campbell, 1979). Selection of the site had predetermined criteria which was accessible and credible to identify the school as per the research purpose. Therefore, non-probability sampling technique was applied for this experimental study, which is also called purposive, purposeful or criterion-based technique (Burns, 2000; Marriam, 1998). As it was stated by Gorard (2003) that “experimental approach considers as flexible in terms of sample selection (p. 27).” Therefore, Iqra School was selected as the research site and following criteria was developed for the selection of the participants,
Table 1:

Sampling Procedure

<table>
<thead>
<tr>
<th>S.no</th>
<th>Participants</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2 Teachers</td>
<td>Minimum 2 years of pre-primary teaching experience</td>
</tr>
<tr>
<td>2</td>
<td>2 Co-teachers</td>
<td>Minimum 6 months of pre-primary co-teaching experience</td>
</tr>
<tr>
<td>3</td>
<td>4 Parents</td>
<td>from control group &amp; 2 from experimental group</td>
</tr>
<tr>
<td>4</td>
<td>60 Students</td>
<td>Age 4-5 years, 30 from control group and 30 from experimental group</td>
</tr>
</tbody>
</table>

3.10. Setting and Research Location

Denzin and Lincoln (2008) describe that the research setting gives an outline to the researcher about when, where and with whom the research will be conducted. This research was conducted in a private school of Karachi. The targeted audience for this research were 60 students in the age bracket of 4 to 5 years, two lead teachers, two co-teachers who teach the targeted classes and four parents from both the classes.

3.11. Pilot Testing

In order to identify the internal validity of the tool in the context of early years, the observation checklist as a whole and all the tests as per the lesson were tested with the teachers, students and parents who were not intended to be a part of this research. However, it was ensured that the characteristics of the participants who were involved in the procedure of pilot testing should have similarity in terms of age, experience and socio-economic background. The purpose of having this phase was to gather the following information (as suggested by Cohen, Mansion & Morrison, 2013):

1. Time required to complete the questionnaire
2. Comfort level of the participants in the entire process
3. Technology implications during the study
4. Understanding level of the participants
5. Clarity in instructions, items and questions
6. Common ambiguities

3.12. Data Collection Procedures

Data collection procedure helps the researcher get the data validated for further analysis. It involves the researcher to triangulate the data in order to achieve more accurate and valid results to maintain the integrity in research (Oliver-Hoyo & Allen, 2006). To get the efficacy of the technology integration in early years classrooms one group passed through the experimental phases of teaching and learning through using technology. While the other group was treated with the same traditional approach to assess the differences between the groups experiencing intervention and not experiencing intervention through proper assessment (See Appendix D). During the teaching, effort was made to observe the behavior of the students. Once, one theme completed in both classes, students were evaluated and data was compared as per the comparative results. In-depth semi structured interviews were also conducted with the teachers and parents to understand their opinion regarding the intervention and if they observe any progress in child’s cognitive and social development. Fraenkel and Wallen (2012) inform that the changes in hours and time of interaction may affect the internal validity of the tools; therefore, at the time of data collection it was ensured that data was collected during morning hours when students come in with fresh minds (American Academy of Pediatrics, 2018). This process was followed in both the group setting simultaneously.

3.12.1. Diffusion

Springer (2010) identified that in experimental research interaction between two different groups i.e. controlled and experimental may enhance the chance of sharing ideas with each other. Therefore, to minimize the chance of diffusion, this research was carried out with two non-randomized sections of school, so the students with the same characteristics but in two different setting can be part of this research where there is a chance of less interaction.

3.12.2. Experimenter’s Influence

Field and Graham (2003) state that in research the role of a researcher needs to unbiased to keep away personal influences in the research. To ensure common delivery of the content for both groups, the researcher took the responsibility to teach the lessons personally. Moreover, to get the validation in the test results, class teachers of particular section were taken into confidence to conduct the test of the
students, which helped the researcher to deviate from any kind of researcher influence on students’ test scores. Appendix D follows an outline of the planning, followed during intervention phase.

3.13. Data Analysis Procedure

Keeping the research design framework in view, data analysis was carried out with two different approaches for quantitative and qualitative research methods. This process of analyzing and comparing the research data is further discussed below to get more clarity.

3.13.1. Qualitative Data Analysis

In the qualitative data, process of analysis includes “transcription, coding the data and developing categories and themes” (Jan, 2017, p. 31). Remler and Ryzin (2015) inform that analysis of qualitative research data is an essential part of the data collection procedure. This process enabled the researcher to understand and record the incidents being witnessed and interviewed (Glense, 2006). This also helped the researcher to make meanings out of the gathered information to get to the conclusion (Silverman, 2013). In this study, an organised analysis process was applied to get a clear understanding of the data. Firstly, after each interview, data was transcribed and shared with the participant in the next meeting. Next, data was coded and categorised with the understanding of research questions. Later, themes were generated to present the findings and create a discussion forum with reference to the generated themes.

Analysis of qualitative data, mainly deals with the “organisation and interpretation (Remler & Ryzin, 2015, p. 77)”. Creswell (2006) identifies three major steps, which has also been found helpful for research analysis:

- “Prepare and organise your data
- Make a summary of your data with the help of coding
- Present your findings through narrative stories, figures or tables” (Ali, 2015, p. 56)

The process of categorization and developing themes helps in creating patterns, classifying relevant responses, make meanings out of it and predict reasons for outcomes (Jan, 2017).

3.13.2. Quantitative Data Analysis

Data which was gathered through experimentation, assessments and observations were quantified by using numbers and further analyzed with the help of a Statistical Package for Social Sciences (SPSS version 20.0). Analysis of quantitative data was conducted using descriptive and inferential methods.
Central tendencies (mean, mode and median) and measure of dispersal (standard deviation) were compared and comprehended to document the frequency charts and distribution tables. All the relevant information through data was used to compare the outcomes generated in the control group and also in the experimental group (Rizvi, 2004). Moreover, inferential test like Paired Sample T-test was employed to identify the level of significance for presenting the results. Paired sample T-test is a procedure to determine the mean difference between two sides of observation. Each observation in the test is measured twice to evaluate the effectiveness of intervention (Statistical Solution, 2018). Those statistical findings helped the researcher to summarize the difference between technology integration teaching and learning process and traditional teaching by evaluating the assessment results of the students after intervention and also through the progress report with pre and post analysis.

3.14. Ethical Consideration

Ethical consideration was taken care of throughout the research study. Before the data collection consent forms was signed by the research participants. Confidentiality of the data was taken care by using pseudonyms to ensure anonymity. Data of the research and results will not be shared with the school management and teaching staff of the school. The research will ensure the cultural sensitivity and school rules and regulations. As the student participants are too young, therefore school head was requested to sign the consents for students and will act in ‘Loco Parentis’ in school settings.

3.15. Limitation of the Study

Since this research was conducted with the early years children, therefore; researcher had to switch the lesson timings according to the mood of the children. For example, in controlled class all the children demanded to be taken for a movie session. In this case, that day lesson was shifted to other day which created a little disturbance in the teaching schedule. Secondly, since the observational survey needed to be filled by keeping one-week observation, while; during that week most of the parents lost the form and then they had to be given another one which they would then fill and sent back. This incident created difficulty in keeping check on the responses which were in turn, received by the parents. Another limitation of the study was related to the development of assessment and observation checklist. Research on this topic specific to the early childhood education prospected had not yet been conducted; therefore, extensive effort was made in developing the suitable tool and getting it verified from experts.
3.16. Summary

This chapter is formed to enable the processes followed in this research by keeping mixed method experimental research design in the overview. It follows the pragmatic philosophical assumption in which researcher got a chance to collect the data with convergent mixed method approach. It discussed the instrumentation design and execution process which underlines with ethical consideration and gone through with certain limitation. The next chapter discusses the major part of this study, that is, data analysis and discussion.
4. CHAPTER FOUR: DATA ANALYSIS AND DISCUSSION

4.1. Introduction

In the previous chapters, research presented around the introduction and background, an in-depth literature review and discussion on the research design. This chapter presents the results of this study with the help of the acquired data. It begins with the demographics of the research participants. In this chapter, data analysis is presented in two sections. Section number one highlights findings gathered from quantitative data; while, section two creates an understanding of qualitative data with the analysis of research findings. Simultaneously, both sections are followed by discussion on the findings of the research. The last part of this chapter follows common outcomes gathered from this mixed method experimental study.

4.2. Demographic Information of the Research Participants

Demographic information of the research participants helps to understand the background information of the research site and participant which further supported the arguments to present the research outcomes. Information given below elaborates the clear understanding of demographics of research participants.

4.2.1. School Geographical Location, Affiliation and Fee Structure

Iqra School has a chain of school systems and comprises of 16 branches set up in urban Sindh. It was established 8 years back with an aim, to impart quality of education and bring excellence to the elementary and higher secondary levels. This school has an affiliation with Cambridge Assessment International Education (CAIE), UK, from primary till O levels. Furthermore, this school follows high scope approach in their pre-primary section. Iqra School is set up near the vicinity of Gulshan-e-Iqbal and surrounded by families from a mediocre economic background. Distribution of levels and number of teachers are given below in Table 2.
Table 2:

Distribution of levels and teachers

<table>
<thead>
<tr>
<th>Levels</th>
<th>Sections</th>
<th>No. of Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pre-Primary Section</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>(Pre-Nursery till Kindergarten)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Lower Primary Section (Grade 1 &amp; 2)</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>Primary Section (Grade 3 till 5)</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>Middle Section (Grade 6 &amp; 7)</td>
<td>8</td>
</tr>
</tbody>
</table>

As a whole, Iqra School employs 50 teachers who are committed to provide quality education to the students. In total, there are 750 students who are enrolled in this school from Pre-primary to 1 grade VII. After investigating from the director during the time of gate entry, it was found that Iqra School charges ten thousand rupees as monthly fees. “We charge minimal fees from the students, that is, ten thousand rupees, but we do not comprise on quality of education; therefore, we hire capable teachers for our students” (Director, January, 2018).

4.2.1. Teachers’ Academic and Professional Qualification Details

Through the initial data, teacher participants’ academic and professional qualification detail was inquired to make sure if they are early years trained or just hired because of their experience and qualification. This detail is given below in Table 3.
Table 3:

*Teachers’ academic and professional qualification*

<table>
<thead>
<tr>
<th>No. of Teachers</th>
<th>Academic Qualification</th>
<th>Professional Qualification</th>
<th>No. experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teacher 1</td>
<td>B. Com</td>
<td>Diploma in ECE</td>
<td>7 years</td>
</tr>
<tr>
<td>Teacher 2</td>
<td>B.A</td>
<td>Diploma in ECE</td>
<td>4 years</td>
</tr>
<tr>
<td>Teacher 3</td>
<td>MA in Education</td>
<td>LMI Montessori Trained</td>
<td>6 years</td>
</tr>
<tr>
<td>Teacher 4</td>
<td>B.A</td>
<td>-</td>
<td>5 years</td>
</tr>
</tbody>
</table>

As can be seen from the demographic information of the teachers, it can be stipulated that almost all the teachers have an ECE certification, more than 4 years of teaching experiences and a basic higher education degree which may provide some ground assumptions that teachers have a relevant ECE background.

4.2.2. Demographic Information of Parents

Demographic data of the parents helped the researcher to connect the financial status of the parent to argue the mediocre economic background of families surrounded by the research site. While conducting the baseline survey from the participant parents during the quantitative data collection, it was found that out of n=30 fathers, most of them are working in a private firm with the percentage of 40; while the least percentage was identified as 3.3% who are earning less salary and working as sales persons. Figure 4 presents the salary background of the fathers in general.
The above figure helps to understand, the overall salary background of the fathers. According to the diagram on the X-axis fathers’ exact salary packages are mentioned which show that 30% of the fathers are earning 89000; however, with the percentage of 6.7 some fathers who earn considerably little seem to be taking a chance of sending their children to a school where the fee is ten thousand rupees. Along with the fathers, the mothers were also considered to identify professional background. After compiling the results, it was found that most of the mothers, with the percentage of 66.7 are housewives and rest of them shared their roles working as teachers or in a private company. Only one mother was found to be studying in a university for higher studies.

4.2.3. Students by Gender, Average Age and Access to Technology at Home

As discussed in chapter three, this research has been designed for children aged between 4 to 5 years. To verify the age and gender of the participants, it is essential to discuss demographic characteristics of the participants. Table 4 is presented to demonstrate mean, standard deviation and ratio group of female and male with gender identity.

<table>
<thead>
<tr>
<th>Demographic Characteristics of Participants</th>
<th>Age Mean (SD)</th>
<th>Gender Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control group- CG</td>
<td>5.001 (0.48)</td>
</tr>
<tr>
<td></td>
<td>Experimental Group- EG</td>
<td>5.034 (0.32)</td>
</tr>
</tbody>
</table>

Table 4 discusses that the average mean of both groups have only a difference of .001 and .034 which does not show any significant difference according to the research intention. While participants’ age is relevant to the age criteria developed for this research. Furthermore, ratio of female and male students is same in CG and EG with 36.7% for female and 63.3% male. This depicts that school is
considered to be gender balanced for early year’s children. To determine, how much parents give access to time to their children to use technology at home and what are the kind of gadgets parents allow their children to use are given below in the form of figure 5 and 6.

Figure 5. Gadgets use at home

Figure 6. Gadgets access time
By referring to figure 5 and 6, it can be seen that most of the parents allow their children to use mobile phones or tablets at home. Whereas, there are number of gadgets highlighted by the parents like iPad, computer, laptop and others which children are suing at home too. Some significant percentages revealed that 43.3% gadget access is given to children by having mobile and tablets. Moreover, 30% students are having access to only mobiles at home; although, through the data it was identified that 100% students get access to technology at home. Figure 6, demonstrate the access time of the students with the technology at home. According to the data, 66.7% children are using gadgets with the minimum time of two hours at home. However, quality time using gadgets at home remained unanswerable through the quantitative data which will further be discussed in the qualitative analysis of the study.

4.3. Quantitative Data Analysis

The purpose of using experimental approach in the quantitative part of the research, was to identify the significant relationship between the traditional teaching methods and it’s learning process and technology-based teaching and the respective learning process along with its impact on students’ academic achievements which merely link to the cognitive development of the children. An observational survey checklist, which was designed with close-ended milestones was also used in this study to investigate the social development of students before and after the intervention in terms of their behavior and attitudes towards their family members, siblings, peers and other friends. Students’ progress report was also considered to see the difference between two groups before and after intervention, its impact on their understanding of the subjects, behavior and creative development. Before presenting the results, following hypotheses are outlined to get an overview of research intention.

1. There is a significant difference between the cognitive development of the students in traditional teaching and technology-based teaching in early years classroom.
2. There is a significant difference between the social development of the students during pre and post intervention in early years classroom.

4.3.1. Reliability Measure

In order to evaluate the internal consistency of the data, reliability measure of the observational checklist was calculated. Reliability was identified through Cronbach’s Alpha and the result
demonstrates that, data was 0.733 reliable. It shows that the instrument is reliable due to its value which measures the internal consistency of the data. Cronbach’s alpha is totally dependent on the number of items which were observed as having high reliability at every subscale (Hair, Black, Babin and Anderson, 2010).

4.3.2. **Hypothesis 1: There is a significant difference between the cognitive development of the students in traditional teaching and technology-based teaching in early years classroom.**

To present the quantitative analysis, both hypotheses will be considered to justify the findings with the relevant theme. Hypothesis 1, is related to the cognitive development of students, so the data which will be discussed in the next part has been analyzed to identify the difference in cognitive development of the students, learning through two different methods.

4.3.2.1. **Teaching and Learning Intervention**

This research was designed and conducted through an experimental method. In which two different groups, having same characteristics were taken as participants to intervene the teaching and learning process through traditional approach and a technologically enhanced approach. As it was mentioned in earlier chapters that, this research has been planned to carry out teaching sessions also. After conducting each session students were assessed in different ways. Those teaching lessons were sequenced as storytelling, word search, free hand drawing, patterns and learning opposites. To evaluate the difference between the two approaches on its outcomes as a form of assessments, table 5 is presented to overview the results of students’ achievement through learning from both the methodologies.
Table 5:

*Paired Sample Statistics of Assessments*

<table>
<thead>
<tr>
<th>Pair</th>
<th>Assessment</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Sig (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pair 1</td>
<td>Story telling</td>
<td>7.33</td>
<td>30</td>
<td>3.377</td>
<td>0.006</td>
</tr>
<tr>
<td></td>
<td>Story telling</td>
<td>9.40</td>
<td>30</td>
<td>1.133</td>
<td></td>
</tr>
<tr>
<td>Pair 2</td>
<td>Word search</td>
<td>6.43</td>
<td>30</td>
<td>2.300</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Word search</td>
<td>9.23</td>
<td>30</td>
<td>.971</td>
<td></td>
</tr>
<tr>
<td>Pair 3</td>
<td>Freehand drawing</td>
<td>4.07</td>
<td>30</td>
<td>1.363</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Freehand drawing</td>
<td>6.83</td>
<td>30</td>
<td>1.315</td>
<td></td>
</tr>
<tr>
<td>Pair 4</td>
<td>Patterns</td>
<td>6.63</td>
<td>30</td>
<td>2.312</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>Patterns</td>
<td>3.37</td>
<td>30</td>
<td>1.712</td>
<td></td>
</tr>
<tr>
<td>Pair 5</td>
<td>Opposites</td>
<td>7.93</td>
<td>30</td>
<td>2.900</td>
<td>0.018</td>
</tr>
<tr>
<td></td>
<td>Opposites</td>
<td>9.33</td>
<td>30</td>
<td>1.155</td>
<td></td>
</tr>
</tbody>
</table>

The table above shows a significant difference between the result outcomes gathered after teaching and assessing students’ learning. The table shows that students’ scores after the story telling session in control group setting has a mean of 7.33, while the mean of experimental group was 9.40. This shows the significant difference between the result of storytelling with .006 sig (2-tailed) value. In word search session, the difference between the mean of control group and experimental group was found to be highly significant with the mean of 6.43 in control group and 9.23 in experimental group. So, the sig (2-tailed) value determine as 0.000. Free hand drawing also shows students’ involvement and interest in technology-based teaching with a mean of 4.07 in control group and 6.83 in experimental group followed by sig (2-tailed) value as 0.000. Teaching patterns have been found to be difficult for the students, due to its complexity and having being less practiced. That is the reason, the mean difference of this assessment was found to be significant with the value of 0.000; however average mean of control group is better than the experimental group with the mean of 6.63 on 3.37. Lastly, children were found to have understood the concept of opposites very well through technology-based teaching. Result show the difference of means in control group is 7.93 and in experimental group its 9.33 which shows the significant difference with a sig (2-tailed) value of 0.018 which is <0.05. To verify the hypothesis, another Paired Sample T-Test was employed by computing the test results according to the particular group.
Table 6:

**Paired Samples Statistics Overall**

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Sig (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>32.4</td>
<td>30</td>
<td>6.317</td>
<td>0.000</td>
</tr>
<tr>
<td>Experimental</td>
<td>38.1</td>
<td>30</td>
<td>2.937</td>
<td></td>
</tr>
</tbody>
</table>

Table 6 proves that, technology-based teaching directly impacts on students’ academic achievement since the sig (2-tailed value) has been derived with 0.000 and also determines the mean difference which is more in experimental group with 38.17.

### 4.3.2.2. Students’ Progress Report

In this research, secondary data was used in the form of students’ progress report. The purpose of using these reports was to identify the relationship between the intervention and students’ academic results. This further helped the researcher to present result analysis with more authentic data. Table 7 is presented to inform the correlation between the progress report of control group before and after the intervention.

Table 7:

**Paired Samples Correlations-Control Group**

<table>
<thead>
<tr>
<th>Pair</th>
<th>Variables</th>
<th>N</th>
<th>Correlation</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pair 1</td>
<td>MCGLiteracy &amp; ACGLiteracy</td>
<td>30</td>
<td>.930</td>
<td>.000</td>
</tr>
<tr>
<td>Pair 2</td>
<td>MCGReading &amp; ACGReading</td>
<td>30</td>
<td>.934</td>
<td>.000</td>
</tr>
<tr>
<td>Pair 3</td>
<td>MCGWriting &amp; ACGWriting</td>
<td>30</td>
<td>.924</td>
<td>.000</td>
</tr>
<tr>
<td>Pair 4</td>
<td>MCGNumeracy &amp; ACGNumeracy</td>
<td>30</td>
<td>.981</td>
<td>.000</td>
</tr>
<tr>
<td>Pair 5</td>
<td>MCGPSD &amp; ACGPSD</td>
<td>30</td>
<td>.947</td>
<td>.000</td>
</tr>
<tr>
<td>Pair 6</td>
<td>MCGKNU &amp; ACGKNU</td>
<td>30</td>
<td>.976</td>
<td>.000</td>
</tr>
<tr>
<td>Pair 7</td>
<td>MCGCreative &amp; ACGCreative</td>
<td>30</td>
<td>.980</td>
<td>.000</td>
</tr>
</tbody>
</table>
According to the values given in the table, correlation between all the learning areas like literacy, reading, writing, numeracy, physical and social development, knowledge around us and creative development has shown positive correlation and significant before and after intervention. Scenario in the experimental group can further be noticed through table 8.

Table 8:

*Paired Sample Correlations-Experimental Group*

<table>
<thead>
<tr>
<th>Pair</th>
<th>MEGLiteracy &amp; AEGLiteracy</th>
<th>N</th>
<th>Correlation</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pair 1</td>
<td>MEGReading &amp; AEGReading</td>
<td>30</td>
<td>.930</td>
<td>.000</td>
</tr>
<tr>
<td>Pair 2</td>
<td>MEGWriting &amp; AEGWriting</td>
<td>30</td>
<td>.944</td>
<td>.000</td>
</tr>
<tr>
<td>Pair 3</td>
<td>MEGNumeracy &amp; AEGNumeracy</td>
<td>30</td>
<td>.045</td>
<td>.812</td>
</tr>
<tr>
<td>Pair 4</td>
<td>MEGPSD &amp; AEGPSD</td>
<td>30</td>
<td>.903</td>
<td>.000</td>
</tr>
<tr>
<td>Pair 5</td>
<td>MEGKNU &amp; AEGKNU</td>
<td>30</td>
<td>.979</td>
<td>.000</td>
</tr>
<tr>
<td>Pair 6</td>
<td>MEGCreative &amp; AEGCD</td>
<td>30</td>
<td>.992</td>
<td>.000</td>
</tr>
</tbody>
</table>

Table 8, also demonstrates the significance between the correlation of mid-term progress report of experimental group and the progress report after two months. However, this table also highlights that there is no significant difference in the writing skills before and after intervention. As the significant value of progress on writing skills before intervention and after intervention remained non-significant with 0.812. Nevertheless, to compare the overall result of early years children with control and experimental group before intervention and after intervention is assessed through Paired Sample T-Test which is given in table 9.

Table 9:

*Overall Paired Sample Statistics*

<table>
<thead>
<tr>
<th>Pair 1</th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Sig (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CGBI</td>
<td>120.9667</td>
<td>30</td>
<td>16.80411</td>
<td></td>
</tr>
<tr>
<td>EGBI</td>
<td>129.2967</td>
<td>30</td>
<td>12.10724</td>
<td>0.24</td>
</tr>
<tr>
<td>Pair 2</td>
<td>Mean</td>
<td>N</td>
<td>Std. Deviation</td>
<td>Sig (2-tailed)</td>
</tr>
<tr>
<td>CGAI</td>
<td>123.4000</td>
<td>30</td>
<td>13.39480</td>
<td></td>
</tr>
<tr>
<td>EGAI</td>
<td>134.4667</td>
<td>30</td>
<td>6.72480</td>
<td>.000</td>
</tr>
</tbody>
</table>
Table 9, describes a non-significant relationship between control ad experimental group assessment results. While, after intervention it can be noticed that the mean value is 134.4667, which shows the result in academic progress of the students who were given teaching and learning sessions using technology. The significance value can be noticed to be .000 after running paired sample T-test with both groups.

4.3.3. Hypothesis 2: There is a significant difference between the social development of the students during pre and post intervention in early years classroom.

Social development in this research study, gauged through the observational survey checklist which was given to the parents and teachers of experimental group students. The purpose of using this checklist to identify whether technology is contributing significantly to the students’ development or not.

4.3.3.1. Social Development

To present the findings of the research it is necessary to elaborate the process of the way parents and teachers filled this checklist. This checklist was given to the parents and teachers and it was requested of them to fill the initial data in which you need to identify a child’s daily social and behavioral actions. After that, since the group was going through with the process of experimentation, parents and teachers were asked to monitor their actions while using technology at home and in school too. Once the data was collected, it was analyzed for further analyses. Table 10 shows what was the parents’ observation regarding a child’s social development before and during this experimentation.

Table 10:

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>N</th>
<th>Std. Deviation</th>
<th>Sig (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pair 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PBI</td>
<td>50.10</td>
<td>30</td>
<td>5.026</td>
<td>.001</td>
</tr>
<tr>
<td>PAI</td>
<td>43.40</td>
<td>30</td>
<td>8.373</td>
<td></td>
</tr>
<tr>
<td>Pair 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TBI</td>
<td>42.00</td>
<td>30</td>
<td>3.107</td>
<td>.000</td>
</tr>
<tr>
<td>TAI</td>
<td>51.50</td>
<td>30</td>
<td>5.231</td>
<td></td>
</tr>
</tbody>
</table>

Paired Sample Statistics for Social Development
By referring to table 10, it can be stated that there is a significant relationship between the social development of children in early years classroom because of initiating technology into teaching and learning process. However, the mean value of observations made by the parents reduced after intervention. It means that parents observed their children as having behavioral issues while using technology. On the other hand, teachers have found the use of technology useful and their observation is pointing clearly towards technology contributing to the social development of the children.

4.3.3.2. Hypotheses Assessment Summary

Table 11:

<table>
<thead>
<tr>
<th>Hypotheses Assessment Summary</th>
<th>Retained</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is a significant difference between the cognitive development</td>
<td></td>
</tr>
<tr>
<td>the students in traditional teaching and technology-based teaching</td>
<td></td>
</tr>
<tr>
<td>early years classroom.</td>
<td></td>
</tr>
<tr>
<td>There is a significant difference between the social development of</td>
<td></td>
</tr>
<tr>
<td>the students during pre and post intervention in early years classroom.</td>
<td></td>
</tr>
<tr>
<td>Retained</td>
<td></td>
</tr>
</tbody>
</table>

4.3.4. Discussion

Research findings gathered from the experimental study, creates a significant difference to make teaching and learning meaningful for the students. Staring from the teaching lessons and taking assessments, technology invited students to learn through fun loving activities. Assessment results proved that, teaching through technology can bring positive change in students’ cognitive development. McLouglin (2002) discussed that learning through technology not only accepts the cultural change but also helps teachers to incorporate activities for different styles of learners. This practice comprehends the learner level to convert their passive learning to deep learning. This was also very much evident from the outcomes of the progress report and its comparison to the pre and post intervention results. It was found from the data that early years children are ready to accept challenging activities. Klopfer, Osterweil, Groff and Haas (2009) used a word transformation, to define the impact of digital literacy on instructional practices which creates digital deeper educational benefits in children. They further
highlighted that technology-based instructional activities evolved history from challenges to success because of its great impact on the cognitive development of the students.

The best example could be as children were faced difficulty in learning patterns, while their motivation towards learning was not ended up, as they performed really well in the next day teaching and learnt opposites through reading words and also able to recognize pictures. However, they were found as needed more practice in learning patterns, this was an observation that students were learning patterns through simple exercises like teachers used to make patterns on the board or give some examples from classroom environment. When, this concept was taught through generating shape patterns using Microsoft paint, they were found as inventing their own patterns through creation of techniques and ideas.

Scoter, Ellis, Railsback and Northwest Regional Educational Laboratory (2000) inform that technology builds a connection of motivation and self-direction for children to use lots of creativity and use the drill and practice the concepts. Those opportunities were actually in this study helped students to experience the problems, discover for the solutions and create an impact on the decisions. Research data also informs that, social development of the students is a matter of concern for the parents. They found that students’ behavior changes when he/she uses technology at home. This was one of the result findings that technology is not bringing any positive behavior in students’ social development. With the same tool, teachers identified that in school, behavior of the students changes due to the use of technology. Students share things with each other, share their feelings and find themselves as responsible. Khan (2017) writes that now a days parents are occupied with different responsibilities. In this scenario children suffer due to less attention given by a family or may take interest in other unproductive activities, this may impact on their social development. Author found that access to technology by having meaningful activities like widely available educational applications teach students the art of communication and give them exposure to make friends and handle adjustments.

4.4. Qualitative Data Analysis

Qualitative method in this study supported the research to bring subjectivity in the data through semi-structured interviews and anecdotal records. The purpose of collecting data through a qualitative method was to understand the perception of the teachers and parents regarding the use of technology in classrooms; support system to provide 21st century skills to the students; its challenges and its impact on
the social development of the students. Following are the questions which were developed to investigate,

1. What are the perspectives of teachers and parents towards integrating technology in early years classroom?

2. How does the school promote technology-based teaching in early years classroom?

3. What are the supporting factors needed to promote technology-based teaching in early years classroom?

4. To what extent does technology contribute to the social development of the child?

5. What are the challenges faced by teachers, students and parents to incorporate technology in teaching and learning process?

To present the findings, pseudonyms are used to maintain the confidentiality and anonymity of the participants as was discussed in ethical consideration (See chapter three). Detail of the pseudonyms are given below in Table 12.

Table 12:

Detail of pseudonyms

<table>
<thead>
<tr>
<th>Name</th>
<th>Pseudonyms</th>
</tr>
</thead>
<tbody>
<tr>
<td>School</td>
<td>Iqra School</td>
</tr>
<tr>
<td>Voice of parent</td>
<td>VP1</td>
</tr>
<tr>
<td>Voice of parent 2</td>
<td>VP2</td>
</tr>
<tr>
<td>Voice of parent 3</td>
<td>VP3</td>
</tr>
<tr>
<td>Voice of parent 4</td>
<td>VP4</td>
</tr>
<tr>
<td>Voice of teacher 1</td>
<td>VT1</td>
</tr>
<tr>
<td>Voice of teacher 2</td>
<td>VT2</td>
</tr>
<tr>
<td>Voice of teacher 3</td>
<td>VT3</td>
</tr>
<tr>
<td>Voice of teacher 4</td>
<td>VT4</td>
</tr>
</tbody>
</table>
Considering Table 12, all the pseudonyms are used in this study for referring the data with the specific participant. To present the qualitative data analysis, research questions were considered to discuss the research outcomes and maintain the coherency throughout. Furthermore, those questions converted into themes to demonstrate the perspectives of parents and the teachers. Additionally, findings of anecdotal records present through comparing and contrasting the observations made by the researcher to triangulate the research data.

4.4.1. Perspectives of Parents and Teachers towards Integrating Technology in Early Years Classroom

Parents’ and teachers’ perspectives regarding technology use in early years classrooms were found to have many positive and some restricted aspects. Both the participants shared their perceptions, relating with their contextual examples. One of the teachers highlighted that, “from head to toe our life is filled with technology. Starting our day from newspaper and taking it to the level of using phone and obtaining different information related to everyday work” (VT4, January, 2018). With the further discussion, one teacher expressed that, “early years children do not like to study through traditional style, they are the children of today’s world. So of course, they need to be educated with well-designed lessons in which technology is also used” (VT2, January, 2018).

Use of technology by many participants was referred to as the demand of this era of 21st century skills. “Technology is very important to deal with because our generation is not for the present they are for the future, so I feel technology is necessary for their development, for their understanding to cope up with the future era” (VP3, February, 2018). Teachers also shared their perspectives regarding students’ learning through technology as,

“It helps a child groom himself and learn more about the world. However, frequent use of it affects mental and physical health of a child. By using technology for teaching concepts, giving an opportunity to use and explore individually” (VT1, February, 2018).

Parents also believed that, technology is now replacing books because of the accessibility of resources which people can get through internet surfing and research. They also infer it as a multi-tasking technique through which a child can learn having different options. As it was stated by a parent that,
“If you are keeping students limited to the books then the child will not be able to do the multitasking which can be done through technology. If I want to explain something to the child so I will buy the book and find out the information from it. On other hand, if I will search the same thing through internet then I will be having multiple options to search the right information” (VP2, January, 2018).

Another parent supported the same idea and expressed that, use of multimedia in exploring the visual part of the illustrations and words can make students interested and motivated for reading.

“I would appreciate and believe that if you go with the book and simultaneously go with the multimedia, then the multimedia will give the different impact of the same book. Because we are in the latest technology era. Books are also essential but for making children interested on the book you can put it on the multimedia then they will definitely go for the book also. If they see something on the screen I feel it is positive for the children” (VP1, February, 2018).

Teachers are also considering technology as source of interest for the students, “I perceive it as a helping aid which helps students to learn with great interest (VT2, February, 2018).

By referring to the advantages of the use of technology in teaching and learning process from the perspective of students’ development, parents have positive recommendation to use technology for visual learning. They believe that technology provides a communication forum through visualization to learn differently.

“If children see videos in virtual setting they can remember the information because it will then retain in their mind instead of reading from book. At one time they are listening, watching and getting multiple things to learn from it. So, it is the fast communication process through which the child is learning” (VP4, February, 2018).

However, parents partially supporting use of technology in early years classroom as they mention that,

“My other child is two years old, he opens all the applications on his own, knows where the videos are and how to use the internet net. Do not think that children will not learn technology later, while in whatever age he will get he will learn quickly at the same time if you think that you will not give this to your child and he will stay behind in studies then I will suggest to take both the strategies together but within limited time” (VP2, January, 2018).

Another parent with some reservations shared that,
“It’s not necessary to use technology in classrooms, because in past we used to study from teachers and many other resources. Because of technology children get far from books like reading books and so many things. Hence, I do not want every subject to be taught using technology, sometimes it helps you to learn lessons with stories, but that is not the case with every subject” (VP1, February, 2018).

She further mentioned, “children may be away from the books and reading habits and can also get eye sight issue” (VP1, January, 2018).

Supporting the idea of technology was found to be quiet confusing for some parents. They do not want their children to lie behind, while they also want the use of technology with some restrictions and conditions. Nevertheless, parents take it as a source of communication too, “we can communicate with each other using technology and we can also use it for many educational purposes like we can google to look for different concepts” (VP1, January, 2018). Moreover, parents have been found supporting technology due to the outcomes they observed in child’s mental development. One parent shared,

“My child used to face difficulty in terms of solving mathematics questions in the beginning. Since I have started giving him some sums using mobile phone applications and games he has improved. Now he is able to solve sums till 10 digits on his own. Learning is for sure done….If he sees stories through visualization it remains as a memory in his mind and he can easily connect it to his own life” (VP4, February, 2018).

Above experience shared by a parent can also be looked into the observations made during intervention. It was found that with the passage of time through practice and everyday lesson using technology into teaching and learning experimental group started working flawlessly. As it was experienced on the last day of intervention that this group developed skills like sight reading, predicting events before it introduces and able to complete challenging task individually (Anecdotal record, experimental group, day 5, February 2018). This development perceived technology integration as an effective tool for early years students to experience. So forth, students in control group were responsive most of the time during discussion; while, they were observed to unable to complete complex tasks due to having monotonous situations with the resource allocation and teachers’ teaching style. This is one of the reasons that students in control group were found to have a less concentration span (Anecdotal record, control group, day 5, February, 2018).
4.4.2. Role of a School in Promoting Technology-Based Teaching in Early Years Classroom

School has been found to play a major role in promoting technology, from the data received from teachers and parents. They believe that, schools can give multiple opportunities to students to get themselves acquainted with learning exercises using technology. By appreciating the research intervention one parent mentioned that,

“As I have seen that you are conducting story telling time using multimedia, the same way you use your library time in which you go for the book presentations using multimedia. Not for the cartoons. Most of the time you need to take it as a subject because it has more impact when we take them to the auditorium, students get a different environment and get more information” (VP2, February, 2018).

There was another parent who supports the idea of how school can encourage the practice of changing lesson into technology-based lessons,

“We can use multimedia in the classrooms to do storytelling through videos, few vocabularies are difficult for the students, but in some stories those words are frequently being used then children can also use it in their daily life” (VP3, January 2018).

Parents were found to be feeling positive about using multimedia for teaching. They recommend it as effective for students to study in an environment where they get exposure like an auditorium and children are also able to see things on a large screen. School is a place where children come from diverse background, where they may get the opportunity to access technology or may not get opportunity to have it even at home. One parent mentioned this point clearly and suggested that,

“Some children might not have the opportunity to use technology at home, so you can strategize things which can be done through paper also. For example, my child uses notes in mobile and writes his name and his friends name while typing. This can also be done on paper so other students can also perform the task at home. May be some parent would say that we do not have an access to technology” (VP1, January 2018).

Another parent suggested, “schools can buy software for educational applications (VP4, January 2018). This parent has shown a positive attitude towards the use of technology in classrooms and how schools can further promote technology through different software applications to encourage effective learning. It informs that, parents also want school to be supportive in terms of bringing in new ideas for
a child’s learning. As one parent discussed, “I will give time to my child of course, if the school can start sending home work related to searching and doing a project using technology. This is how I also make my child learn how to use technology in a proper manner” (VP3, February, 2018).

At the time of interviewing teachers, they also believe that learning through technology is useful for the students. As it was stated, “children will love to learn through technology, the concepts can easily be delivered and they can also compete with their surrounding (VT3, February, 2018). By surroundings, the teacher meant the students who are considered digital natives and are already creating their identity in the society by using technology as 21st century skills. It creates an impression that parents themselves are also motivated and they really want a school to become supporting factor for promoting quality of education. Technology is not limited to teaching; however, teachers believe that, “it makes assessments effective through fun loving activities. Technology integration can create possibility for the learners to reduce fear from assessments” (VT3, February, 2018).

When teachers were inquired regarding the support the school can provide to promote technology-based teaching in early years classrooms, they came up to this idea that, “school can provide individual gadgets to the classrooms for promoting technology-based teaching, they can also arrange workshop for the teachers to understand the effective utilization of technology” (VT3, January, 2018). With further investigation, teachers shared that, “in school major support is required from head and admin staff in terms of allocation of resources and allowing innovative teaching techniques to use them in the classroom” (VT2, January, 2018). Teachers were found to be looking forward to get support from school to apply new strategies in their classrooms; however, role of a school head and administration is significant to promote an idea of technology integration in early years classroom. Teachers also highlighted that due to not having separate ICT lab for early years children we face issue teaching students, ICT based lessons.

Nevertheless, observations made through anecdotal records inform that students who were given a chance through intervention to learn through technology application in teaching and learning process, were found to be more enthusiastic, and attentive than the control group. Because, the control group was found to be facing difficulty in terms of understating teacher’s instructions, due to this reason teacher had to repeat her instruction two to three times (Anecdotal record, control group, day 2, January 2018. However, in the same activity experimental group was found not only retaining information but also repeating with their colleagues to share new things they learnt (Anecdotal record, experimental group,
day 2, January 2018). This intimates that, if school provides opportunities to the students to learn in different settings they become responsive and retain the information easily.

4.4.3. Role of a Technology in Promoting Social Development in Early Years Classroom

According to parents, technology sometimes changes students’ behavior in terms of making them over confident about doing work what others cannot do. It also becomes a reason for bullying other children by dominating their colleagues. As a parent stated that, “when he gets something, he shows with confidence to his friends that yes, I can do this, then he starts bullying others and feels yes, I am now a 1Dada of the class” (VP4, January, 2018). This may be a sign that the child is getting self-confidence and ready to take more challenge. However, parent highlighted this incident as a problem which is reported in this section.

Regarding social development, parents highlighted that it also impacts their personality. For example, one of the parents mentioned,

“Once, I noticed that Doremon speaks very loudly so he also speaks loudly, he replicates his tone. So, I restricted him not to see more Doremon and he promised me that he will not watch it. But I see that he started watching that cartoon again. So, I believe I’ll let him do it for some time because restricting him from everything is also not good for the children” (VP3, February, 2018).

Parents, believe that restriction somehow does not work if it links to the interest of the children. It is important to give them opportunities to explore but with supervision and guidance. Most of the participants highlighted the issue of access to technology at home due to financial or for other reasons. While, one parent suggested how technology can reduce the gap between its access at home and social development of the students significantly,

“Take a group of small students, you can have children like who use technology at home and let them teach others this way you will see how other students also getting benefit from the students who use technology at home” (VP2, February, 2018).

Teachers in the classroom dealing with multiple behavioral issues; while, during the interview when teacher asked to share her views regarding use of technology and social development, she mentioned that, “frequent use of technology creates a negative impact on child’s behavior. It makes them impatient, frustrated and used to of it” (VT2, January, 2018).

1This word presents a rough language which is used to describe a person who dominates others
At one place a parent shared the personal experience of her child, about what happens when she uses mobile phone or laptops more than an hour,

“The more they use technology, the more exhausted and frustrated the get. If she used technology for more than one hour she gets frustrated, she can’t answer properly, she becomes angry. They are also not giving importance to the ones who are in their surroundings, they do not want somebody to disturb them or talk to them. The basic problem with YouTube is if you allow your child to use it then the child can look for any video and there is no check no stop that is the basic problem. They can show you things like videos on pregnancy…. I observed her that she takes interest in all those things. If she is busy in using gadgets and her father has come so she will not even greet him” (VP1, January, 2018).

This parent describes her experience with her daughter as, her child shows tantrums at the time of using gadgets for longer period of time. She thinks that her child is forgetting their ethical values because of having too much interest in watching videos. Later the same parent asked for the solution of this issue and she mentioned that,

“Actually, we are not allowing our children to use the gadgets properly. They watch you tube and we allow them to do that. This is not the best way to use technology. But yes, I remember, last week the teacher gave homework on recycling plastic bottles. My daughter and I, both searched the internet about what is the best way to use plastic bottles to create something and we did it together” (VP1, January, 2018).

Findings of the research, informs that technology makes responsible and accountable to everyone. Parents somehow focus on other side of technology like utilizing the spare time of their children in watching those videos. While use of technology is a huge task which has also being reflected from parents’ overview. One parent during interview sought for assistance from the teacher, as they believe that children listen to their teachers more than parents. She highlighted that,

“They believe in their classmates and teachers more than their parents. If teachers can guide the children when to use gadgets, if any guest comes at home you have to put them in a side and greet them, they will surely be improved” (VP4, January, 2018).
At the time of collecting data, one teacher was found to be sharing positive aspects of technology in relation to social development of children, “we can teach them many values like sharing and caring, connecting with the global world, take care of things etc” (VT4, February, 2018).

Group leaning and classroom management was also observed during writing anecdotal records. Those records were actually made to understand the dynamics used by teachers to get the students focused on the task and how students are interacting with each other in terms of sharing responsibilities, helping each other and their responses for different activities. It has been noticed that, students who were working in control group were found to be less interested to work in a group setting during the lesson. That was the reason the teacher was found to be facing classroom management issues with control group most of the times (Anecdotal record, control group, day 1, day 2 and day 5, January, 2018).

While, scenario in experimental group was quite different, their interest towards activities was high due to the effectiveness of resources and they also found helping each other for performing the task. For instance, during the story telling session students took the opportunity to do the classroom management and maintain discipline during the lesson (Anecdotal record, experimental group, day 1, January 2018). While during the same session, because of teaching through traditional approach, another group students found had fights with each other on sitting in front and pulling the book from each other (Anecdotal record, control group, day 1, January, 2018). Teaching through technology basically found as helping teachers to manage the classroom effectively.

4.4.4. Supporting Factors in Promoting Technology-Based Teaching in Early Years Classroom

By discussing the role of a parent in the use of technology, one parent responded that, “technology can also give them bad things, no one can say that they learn only good things. But if we keep check on them then they can develop on the positive side of it to get the knowledge and to get the good practice” (VP4, February, 2018).

Parents feel themselves very much responsible to monitor students’ activities, during the time of giving gadgets or allowing them to use mobile application. They feel that children need to be supervised at the time of using technology as they get multiple options to explore and all the options are not necessarily give good messages to them. As it was highlighted by the parent that,

“We need to keep a check on them so we have to give them some certain period of time. This time you can also go for the laptop only for 30 minutes, we can go for applications only, we should not
give them more time to use those applications. I have seen if I will let him do and play with phone and I get busy with something, so I believe he will be start watching videos and I think that is the time I need to stop him. Because if I will not stop him he will continuously be using it, this is what I do not appreciate” (VP3, February, 2018).

Parents also shared their extra effort as a promoting factor at home because of introducing technology-based learning activities. One of the parents discussed that, “I encourage him to play games like mathematics or English, the games should be the kind that really helps a child in brain enhancement” (VP2, February, 2018). Teachers also believe that school, parents and teachers collaboratively become a supporting factor for promoting technology-based teaching in early years classroom. As they stated, “cooperation of parents, availability of gadgets and awareness provided by the teacher to the parents about the benefit of technology-based teaching can bring positive change in students’ learning (VT2, February, 2018).

There was another parent who was found to be really optimistic regarding learning through technology and shared that,

“Basically, I have got an opportunity to buy a package from learning time institute they have given me an iPad. They have their own applications…. for example, teacher has given a ‘vocabulary meaning word smaller, so I placed an application on laptop and I found there was an activity of opposites and from that he started learning the instructions, like click on the smaller ball. So, my child started looking at the smaller ball, so he got the concept and now he can make sentences as well” (VP4, February, 2018).

One more parent discussed that,

“I feel that computer is the basic thing every parent should have it at home…. parent should also give opportunity to their children to use it, every time do not say do not know, if they will do something bad they will get experience. School should tell parents they should use certain applications to use. This is the era we should go for the advantages of computer” (VP3, February, 2018).

Computers, in this era have become a demand for research purpose. Parents shared their responsibility and favor from the school system that how can they create a bridge between home and school educational programs and how it is useful for learning purpose. Computers also allow students to explore many applications and software for learning purpose. For example, Microsoft paint was used
with the experimental group to allow them to use it for practicing free hand drawings. It was observed that, students were making patterns on their own without the assistance of teachers and tried to explore different icons by themselves. Though, they were not able to read the instructions but by looking at the pictures children were able to operate the software before teachers’ instructions (Anecdotal record, experimental group, day 3, January, 2018). On other side, the control group was given the same task but resources were pencils, colors and a sheet of paper. They came up to present their work mostly related to the nature or family; while, due to this limited exposure children were not able to think creatively and produced the same drawing which they usually practice every day (Anecdotal record, control group, day 3, January, 2018).

4.4.5. Challenges in Promoting Technology in Teaching and Learning Process

Monitoring children’s activities during the time of using technology has been found to be one of the challenges by the parents. As it was mentioned, “there is some limitation, timings and parents should observe what they are using” (VP1, February, 2018). One of the teachers, during interview shared that, “technology may become an issue for us if we really do not know how to use it for educational purpose. There may be times where we have to face resource allocation issue due to multiple reasons or the students may misuse the gadgets provided to them” (VT4, January, 2018).

It was identified from the data, that dependency on technology-based teaching lessons may lessen the value of teachers which was endorsed by one of the parents. “There should not only be technology, teachers' experience, both are important. But it should be introduced may be for particular time period but not totally depending upon teaching through technology” (VP1, February, 2018). Teacher somehow agrees to this challenge and came up to the conclusion that, “children become so dependent on such gadgets that their mind doesn’t function without it. They think that this is the only thing which can make them understand the given concepts. They don’t bother to use handmade material in the class” (VT3, February, 2018). Teachers believe that introducing technology may hamper the students’ need of using sensorial materials which may affect their developmental areas like physical development.

Parents also share that one of the issues of using technology and giving freedom to the children to use them the way they want is watching cartoonish videos which sometimes become harmful for them because of its impact on child’s personality. Children get inspired quickly form their favorite character and then think of themselves as they have become the same character, so they have to act like them.
“I have seen parents that they give liberty to their children to watch cartoons whatever time they want. But it’s not right, because after watching cartoons they think in a cartoonish way. I have seen my child once shared with me that he saw Mr. Bean in his dream. So, I feel that this should be stopped. Because after watching videos for long they start thinking in a cartoonish way” (VP2, January, 2018).

While talking on the same issue another parent commented that, “there must a study on it that how to use it in an effective manner to this generation” (VP3, January, 2018). Teachers highlighted another main issue in promoting technology with early years children. One of the teachers mentioned that, “technology definitely gives positive outcomes, but sometimes it makes the child addicted to it. Unlimited use of technology will affect their studies as well” (VT1, January, 2018). Teachers perceive the addiction may become the cause for a lack of interest from other surrounded activities, children may get interested to explore it further rather than keeping themselves organized to limit the technological activities.

4.4.6. Discussion

Qualitative data of this research, initiated themes with certain aspects of using technology with early years children for not only the purpose of teaching and learning; while, it is beneficial to invite parents to become a part of the learning community, but also to encourage and enable students to gain self-confidence and get others on board to share the learning process. Along with the advantages, it also brings to notice some disadvantages with regard to child development, like behavior issues, forgetting ethical values, language issues, addiction and parents’ lack of awareness about using technology for a positive purpose.

Findings in this section, highlights that parents and teachers consider technology as a 21st century skill which is in high demand and enhances the competency level of students. Trilling and Fadel (2012) share that an important resource for 21st century skills to carry is digital literacy. This is a necessary skill needed to survive and thrive in this complex time when the world is becoming more competent and connected with each other with every passing second. However, there is a level of insecurity with technology use mentioned by parents that, it can affect children’s social development as they find themselves getting more and more interested in gadgets and not following ethical values that they have been taught by their parents. Mainly, they highlighted that children need to be supervised as they are
very young and unaware of cyber security related issues. Parents realized that somehow, they are responsible for the negligence and behavioral issues of the child which were created due to the extensive use of technology without having any kind of a check.

With the help of observation, students were noticed to be having the curiosity to learn different things through exploring technology. They were also found to be keener towards completing a difficult task because of interest and readiness to learn. While, the other group was found to be losing interest quickly because of having limited access to the teaching and learning resources. Skills like classroom management, leadership and following social norms were much evident with the experimental group; however, the control group at the same time was facing the same skills as a hindrance due to monotonous teaching techniques. Jhurree (2005) argues that technology provides an enhanced learning environment for learners to be constructive and engaged with the given opportunities. It was further discussed that learners get the optimum chance to discover and get the pedagogical benefits of technology in the classroom through experiencing the constructive model of learning rather instructive model.

4.5. Common Outcomes

Since this study was following mixed method experimental research design, it has brought some common outcomes which have relevant information to get this research to the conclusion. Firstly, through quantitative and qualitative data it has been found that parents believe that using technology with early years children is not appropriate due to social development. That reflects from table 10, where parents observed their children having behavioral issues while using technology. This point has also been mentioned during the interview by most of the parents. With the same concern, parents have been found discussing that the reason for this problem may be, not keeping an eye on their children while they are using gadgets. This issue is the recommendation for parents to introduce some meaningful activities to the children for their learning. Mikelic Preradovic, Lešin and Šagud (2016) found that parents feel anxious and possessive about their children when it comes to using technology in school. However, they themselves allow their children at home to not only use technology but also give them exposure of computers. They further claimed that it never guarantees that the tools children are using at home always result in the development of digital literacy. Second common outcome was the introduction of competency in terms of giving challenging tasks to the students. Through the
quantitative data, it was found that consistency in terms of assessment result with the control group went down due to having fewer challenging activities for them during the time of teaching. Technology allows learners to explore and get themselves involved in engaging activities through multiple resources; however, the control group only got a chance to learn with the materials available in the classroom boundary. This was also highlighted during interviewing parents and teachers that, technology allows learners to multitask and enhances the level of competency. The last common outcome was the effectiveness of assessments through fun loving activities. It was obvious from the assessment results of the experimental group that learning through technology makes assessment for the learner significant to achieve good result. Because they learn complex ideas quickly which help them attempt the assessment with a positive approach. Teachers also highlighted that, integrating technology in assessments can bring a positive change in the child’s behavior and it can also reduce the fear of assessment among children. Technology-based assessments benefit learners to attain more options if he/she is not able to achieve one. It is not done in isolation, rather with active learning. As discussed by Gohl, Gohl and Wolf (2009), technology-enhanced questions demonstrate more complex thinking and help understand the material in a way that was difficult in traditional times. In particular, assessments which are designed to evaluate the performance of the learners are much dependent upon the multiple sources of information gathered from a technology-based teaching style.

4.6. Summary

This chapter consisted of the true essence of the research study. It started with the demographics of research site and participants. Through the quantitative data it was found that technology integration in an early year’s classroom is significant from the perspective of cognitive and social development. It is evident from not only the assessment data but also from the progress reports of the students. Through the qualitative analysis it was determined that technology is the demand of this era, so the children should be given the opportunity to learn through meaningful activities. Parents and teachers shared their experiences with the children at home and also in school about how technology can bring change into the teaching and learning process if it is done in certain limitations and under adult supervision. The next chapter summarizes the research with some conceptual understanding and presents recommendations for the future.
5. CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS

5.1. Introduction

Keengwe and Onchwari (2009) claim that “technology is changing the business of teaching” (p.209). This entire research proves this statement by showing that technology with the meaningful approach achieved successful outcomes in terms of students’ cognitive and social development. This chapter concludes the study by initiating different concepts that help to understand in what aspects technology is beneficial for early years children in the classrooms. It follows recommendations for stakeholders and also for a future researcher to be taken into consideration provided the research interest.

5.2. Conclusion of the Study

“Technology is a tool that can provide another way for children” (Klopfer, Osterweil, Groff and Haas, 2009, p. 16). This study was designed to identify the results with experimentation of technology integration in early years classrooms. The major purpose of this study was to meet the demand of the global society and also to motivate parents and teachers to be more accepting and open towards the latest teaching techniques. Use of technology in early years promotes the curiosity and keenness to dig out information and solve problems at their own pace with a direct indirect approach. This means children tend to identify the solutions through independent search for possible answers. Technology allows learners to make their learning experience meaningful, build on concepts and notions, access to generate information, work with groups without gender biasness, communicate and create ideas, participate in social interaction and apply a range of skills for the outcomes (Jalongo & Isenberg, 2012).

The major strengths of using technology for young children are the multiple opportunities and motivation to learn through identification, communication, problem solving and discovering to learn and make sense of the world. By using appropriate technology support provided by teachers or other responsible members for the child’s learning can extend the developmental learning areas and open more chances for the children to gain exposure and learn with the demand of global society. However, it is also important to keep a healthy balance between “elements of childhood with the unique capabilities offered by technology” (Scoter, Ellis, Railsback and Northwest Regional Educational Laboratory, 2000, p. 99). By looking at the short comings, Leidner and Jarvenpaa (1993) found that people must not only
have been trained in using hardware and software but must also have been trained in meeting strategies in order to effectively use these resources (Hiltz and Johnson 1990). Similarly, this study of electronic classrooms suggests that new teaching methods may have to be learnt in order to effectively use technology. They further suggested that computer-based teaching methods might be encouraged as a mean of enhancing classroom learning, although it may require trial-and-error or experimentation to determine the most effective uses of technology.

The role of a parent with the utilization of technological resources is to become a guide who mentor the child to make sure that he is moving on the right track. Elango, García, Heckman and Hojman (2015) highlighted that parenting affects children’s ability in multiple ways. Their sustenance through warm behavior, support and care, creating a learning environment through financial resources, value of time spent with the children and their direct instructions which foster better environment for their development. Rich (2018) mentions that one of the reasons of having readiness among children for school is, the parent. Parents’ involvement in children’s’ school, quality time and dialogues redirect their education level. This is the most affordable way in which a parent can uplift a child through involvement and integrates learning which happens outside the classroom.

Early years children are closer to their parents; therefore, all kinds of learning practices can only get positive outcomes when they are reinforced by the parents. Likewise, parents can also support their children if they create appropriate technology-based environment for them through providing a variety of activities according to the available resources and home-based experiences. Research has proved that parents’ support and encouragement in terms of promoting learning through technology is required for the development of the children (Keengwe & Onchwari, 2009). Parents who think that technology integration in teaching is essential for their children are also observed as practicing the concepts with their children during home time (Willis, Weiser & Kirkwood, 2014).

Technology in the classroom can create differences through different means. Teachers can introduce action oriented based activities which can enhance students’ reading and cognitive development with almost limitless source of options. This kind of practice opens vast doors for learners to explore and learn through inquiry-based experiences. It also helps students to get the information from diverse culture, work with each other and access to numerous experiences (Willis, Weiser, & Kirkwood, 2014). Oxford learning center (2011) believe that traditional based practice can only make students passive learners and does not invite students to participate in any kind of academic challenging activity. Emerging
technologies are steadily increasing their presence in classrooms and reshaping what and how students learn and the way teachers think about teaching, learning, and organizing the classroom. The most effective way of getting the benefit from technology in educational setting, if it is integrated into curriculum. This becomes the best practice for the practitioners to incorporate it as their teaching tools (Keengwe & Onchwari, 2008).

Beaty (2009) stated that assessment in early years is a process to document a child’s growth and behavior through observation and recording critical incidents. During early years children tend to perform tasks that helps in understanding their learning patterns and also in curriculum planning. Data and information are gathered through assessments, which then facilitates teachers to plan experiences according to students’ needs. Observing children while performing tasks is an informal way of assessing students, while researchers led the creation of developmental milestone through formal observations. Beaty (2009) further stresses that “in early childhood program assessment tools like anecdotal records, checklists, participation charts, rating scales, sample of products, photographs, tape recordings and portfolios are used to interpret knowledge and skills, learning and outcomes of the child” (p. 52).

Hence, technology invites children to learn in additional ways in accordance with unique learning styles and pursue variety of prospectus (Jalongo & Isenberg, 2012). Technology can have a reciprocal relationship with teaching. The emergence of new technologies push educators to understand and implement, at the same time, creating meaningful activities for children to comprehend and apply to their practices. Research has confirmed that, the schools model of technology and networking has a great impact on students’ achievements and teacher’s professional development by observing and coordinating technology-based teaching in early years classrooms (Johnson, Schwab & Foa, 1999). In a nutshell, this research opened a platform for the stakeholders to experience three different outcomes gathered from this research which may be investigated further in the future: Learning and innovation; digital literacy skills; and life skills in early years children (Trilling & Fadel, 2012).

5.3. Recommendations

After a thorough research in the following are some recommendation for relevant stakeholders and for future study.
1. Schools should promote technology-based sessions not only for the children but also for their parents to make them aware of the effective usage of technology and provide them guidance on how to support their children for its positive use.

2. Teachers need to develop lessons by integrating technology with meaningful activities and also involve parents to experience the execution of the lesson.

3. Students must be given chances to work in a group setting while using technology to support each other and learn social norms.

4. School heads should arrange orientation for parents to demonstrate some teaching skills to integrate technology for the learning purpose at home too.

5. School should open forum for the teachers to develop professionally to use technology in an effective manner in classrooms and design relevant lesson plans for the students.

6. School management should try to make the 21st century learning equipment available as per the affordability to provide children high quality education in schools.

7. Policy makers should emphasize schools on promoting technology based teaching and learning techniques and can liaison some private schools with the public schools to model them.

5.4. Self-Learning from the Study

This section presents my own learning which I took from this research. Firstly, I have found that children become good at multitasking if they are allowed to explore different options at one time. It creates a learning curiosity among them to do new and challenging things. Secondly, children tend to be visual learners, they need to be given the opportunity to observe and learn through it. Next, diversity and opportunities should be balanced in schools. It means that children coming from different backgrounds should be given equal chances to learn with others with the equal opportunity through strategizing the group technique. Moreover, technology helps children to gain self-realization by becoming confident about their own work and easy about it being compared with others. Finally, the challenges that were revealed in this study are the mindsets of parents and their practices with children at home by handing them gadgets and letting them play around with them, unsupervised. Schools may fill up this gap by involving parents and giving them tasks to do with children at home.

Hence, integrating technology in early years classrooms drive the educational setting towards the development of students, teachers, schools and society. The digital world is the future of these children;
therefore, it is their right to get relevant education for becoming essential members of this global society.
REFERENCES


Pianta, R., Barnett, S., Burchinal, M., & Thornburg, K. R. (2009). The effects of preschool education: what we know, how public policy is or is not aligned with the evidence base and what we need to know. Psychological Science, 10, 49–88.


APPENDIX A

TIME FRAME OF THE STUDY

<table>
<thead>
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</table>
APPENDIX B
INFORMATION SHEET FOR THE PARTICIPANTS

Researcher Name: Shehnaz Zulfiqar Ali, M.Phil candidate IOBM.
Email. Shahnaz.ndie@gmail.com

Research Supervisor: Dr Nasreen Hussain, Professor IOBM.
Email: nasreen.hussain@iobm.edu.pk

Research Topic: Technology Integration in Early Years Classroom: Voices of Parents and Teachers

Purpose of the Research:
The purpose of this research is to experiment technology integration in early years classroom and also to understand the perspectives of parents and teachers related to this concept.

Time Frame and Data Collection Procedure:
This research is spread into two months five weeks. My study will start from 15th January 2018 till 25th February 2018. There are some key tools required to direct my research to get the answers of my research question. Thus, I will generate the information of my research through semi-structured interviews, observations and teaching to two kindergarten classes for 6 weeks.

Confidentiality and Anonymity of the Data
I will use pseudonyms to ensure anonymity, where no real names of participants and institution will be mentioned in the research. Only the researcher and supervisor will reach and access the data. The data will be kept in a secure place and protected. Hence, this data will be kept only for two years and then it will be destroyed.

Reciprocity
Principal and participant teachers will be acknowledged in my research for their support and participation without disclosing their names. Furthermore, the short summary of the data will be shared with the school principal so the school can get benefit from the findings.
Questions or Concerns

For any clarification, queries or concerns about this study, please feel free to contact the researcher or the research supervisor on the above given contact details.
APPENDIX C1
CONSENT FORM FOR DIRECTOR

To: The Director

__________ School

Karachi.

From: Shehnaz Zulfiqar Ali, Student of MPhil program at Institute of Business Management, Karachi.

Subject: Permission for conducting research at the _________________ School.

Dear Sir,

I am a student of MPhil program at Institute of Business Management, Karachi, Pakistan. As part of my on-going (MPhil) program from the IOBM, I am required to conduct a research on “Technology integration in early years classroom: Voices of parents and teachers” which will lead to a MPhil thesis.

The purpose of this research is to experiment technology integration in early years classroom and also to understand the perspectives of parents and teachers related to this concept. For this purpose, I will be working closely with 60 students, four teachers and four parents. My research approach will be Mixed method experimental design in which I will gather my data by using three different ways, teaching and assessing, semi-structured interview and observation. With all the participants’ consent I will record interviews. I will primarily respect the confidentiality of the data and will not use it for other than the purpose described in the information sheet which is attached with this letter for your reference.

I hereby, request you to kindly allow me to conduct my study in your school, for two months i.e. January 2018- February 2018.

I am looking forward to your positive response.

Thank you.
APPENDIX C2
CONSENT FORM FOR TEACHERS/
INFORMED CONSENT FORM FOR PRINCIPAL

I, (name) _____________________________________ Principal of (School Name) ___________________________________ agree to participate in the study on “Technology integration in early Years classroom: Voices of parents and teachers” will be carried out by Ms Shehnaz Zulfiqar Ali course participant of MPhil Program at IOBM. During the study I assure to extend my full support with regard to successfully completion of the study by providing time for conducting classes, observe students, conduct interviews and allowing her to record it.

I have read the attached information sheet and I am clear about the purpose of this study.

Signature of the School Principal: ___________________________ Date: ______________

Signature of the Researcher: ________________________________ Date: ______________
I, (name) _________________________________________ Parent of ___________________________________________ agree to participate in the study on “Technology integration in early Years classroom: Voices of parents and teachers” will be carried out by Ms Shehnaz Zulfiqar Ali course participant of MPhil Program at IOBM. During the study I assure to extend my full support with regard to successfully completion of the study by providing time for conducting classes, observe students, conduct interviews and allowing her to record it

I have read the attached information sheet and I am clear about the purpose of this study.

Signature of the School Parent: ______________________ Date: ______________

Signature of the Researcher: __________________________ Date: ______________
APPENDIX C4

LOCO PARENTHESIS FOR STUDENTS

I, (name) _________________________________________ Principal of (School Name)___________________________________________ agree to the participation of the students of KG _________ (sections) in the study on “Technology integration in early Years classroom: Voices of parents and teachers” will be carried out by Ms Shehnaz Zulfiqar Ali course participant of MPhil Program at IOBM. During the study I assure to extend my full support with regard to successfully completion of the study by providing time for conducting classes, observe students, conduct interviews and allowing her to record it.

I have read the attached information sheet and I am clear about the purpose of this study.

Signature of the School Principal: ______________________ Date: ______________

Signature of the Researcher: __________________________ Date: ______________
## APPENDIX D
### LESSON EXECUTION PLAN

<table>
<thead>
<tr>
<th>Days</th>
<th>Type of group</th>
<th>Task</th>
<th>Resources</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 1</td>
<td>Control</td>
<td>Pre-test to test prior level of understanding</td>
<td>School evaluation report</td>
<td>6 months ongoing progress</td>
</tr>
<tr>
<td></td>
<td>Experimental</td>
<td>Pre-test to test prior level of understanding</td>
<td>School evaluation report</td>
<td>6 months ongoing progress</td>
</tr>
<tr>
<td>Day 2</td>
<td>Control</td>
<td>Story telling session “Hungry caterpillar”</td>
<td>Story book</td>
<td>Quiz based on story memorization</td>
</tr>
<tr>
<td></td>
<td>Experimental</td>
<td>Story telling session “Hungry caterpillar”</td>
<td>Animated video through multimedia</td>
<td>Quiz based on story memorization</td>
</tr>
<tr>
<td>Day 3</td>
<td>Control</td>
<td>Word Search</td>
<td>Sight Reading</td>
<td>Worksheet</td>
</tr>
<tr>
<td></td>
<td>Experimental</td>
<td>Word Search</td>
<td>Website activity</td>
<td>Worksheet</td>
</tr>
<tr>
<td>Day 4</td>
<td>Control</td>
<td>Free hand drawing in pairs</td>
<td>Art pads &amp; colours</td>
<td>Drawing</td>
</tr>
<tr>
<td></td>
<td>Experimental</td>
<td>Free hand drawing in pairs</td>
<td>Computer lab-Microsoft paint</td>
<td>Drawing</td>
</tr>
<tr>
<td>Day 5</td>
<td>Control</td>
<td>Teaching patterns through chalk and talk method</td>
<td>Board &amp; marker</td>
<td>Worksheet complete the patterns</td>
</tr>
<tr>
<td></td>
<td>Experimental</td>
<td>Teaching patterns through mobile application</td>
<td>Mobile phones</td>
<td>Worksheet complete the patterns</td>
</tr>
<tr>
<td>Day 6</td>
<td>Control</td>
<td>Teaching opposites</td>
<td>Talk and chalk method</td>
<td>Worksheet</td>
</tr>
<tr>
<td></td>
<td>Experimental</td>
<td>Teaching opposites through picture illustrations</td>
<td>Different animated motion pictures</td>
<td>Worksheet</td>
</tr>
</tbody>
</table>
Dear Parents

Now a day’s gadgets and other sources of technology create influential environment for the children in classrooms and at home too. To make the teaching and learning effective and also to understand the limitation of technology on child’s behavior and cognitive development, this research has been designed to gather the information from parents regarding their observation and mindset towards the technology in children’s life. Your children will also be a part of this research as they will be given some lessons through using technology. However, anonymity and confidentiality will be maintained with the data analysis; therefore, you are requested to fill the required information by observing your child at home. You are also requested to sign the given consent form which is attached with the following page.

I ______________ mother/father of _____________ who studies in _____________ confirms my and my child participation in this research which will be conducted to identify the cognitive and behavioral changes in relation to the use of technology with early years children at home and in school too.

Parent Signature ______________________

<table>
<thead>
<tr>
<th>Demographic Information</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Father’s Occupation</td>
</tr>
<tr>
<td></td>
<td>Mother’s Occupation</td>
</tr>
<tr>
<td>Salary Bracket</td>
<td></td>
</tr>
<tr>
<td>10000- 29000</td>
<td></td>
</tr>
<tr>
<td>30000- 49000</td>
<td></td>
</tr>
<tr>
<td>50000-69000</td>
<td></td>
</tr>
<tr>
<td>70000-89000</td>
<td></td>
</tr>
<tr>
<td>89000- more</td>
<td></td>
</tr>
<tr>
<td>Technology, child uses</td>
<td></td>
</tr>
<tr>
<td>Mobile phone</td>
<td></td>
</tr>
<tr>
<td>Tablets/ Ipads</td>
<td></td>
</tr>
<tr>
<td>Computer</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
</tr>
<tr>
<td>Technology, access to</td>
<td></td>
</tr>
<tr>
<td>gadgets</td>
<td></td>
</tr>
<tr>
<td>Less than one hour</td>
<td></td>
</tr>
<tr>
<td>More more than two hour</td>
<td></td>
</tr>
<tr>
<td>One to Two hour</td>
<td></td>
</tr>
<tr>
<td>Not at all</td>
<td></td>
</tr>
</tbody>
</table>
Note A: Please observe the following behavior and mark your answers in the correct column.

<table>
<thead>
<tr>
<th>S.No</th>
<th>Behaviour</th>
<th>Never</th>
<th>Sometimes</th>
<th>Usually</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Takes part in collaborative activities with siblings and other children</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Takes interest in making groups and play</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Tries to be like by siblings</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Tries to please friends</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Seeks adults’ approval</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Takes part in conversation with others</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Shows awareness to others’ feelings</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Often impatient</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Wants to work independently</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>10.</td>
<td>Begins to learn to control some intense feelings</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>11.</td>
<td>Tries to justify anger</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Does not like advice</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Shows love and affection to others</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Respects property rights to others</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>15.</td>
<td>Eager to share things and ideas with others</td>
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<tr>
<td>16.</td>
<td>Eager to take challenges</td>
<td></td>
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<tr>
<td>17.</td>
<td>Eager to make friends</td>
<td></td>
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Note B: Please observe the following behavior again when your child is busy in using technology at home, accordingly mark your answers in the correct column.

<table>
<thead>
<tr>
<th>S.No</th>
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<th>Sometimes</th>
<th>Usually</th>
<th>Always</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Takes part in collaborative activities with siblings and other children</td>
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</tr>
<tr>
<td>2.</td>
<td>Takes interest in making groups and play</td>
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<tr>
<td>3.</td>
<td>Tries to be like by siblings</td>
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<tr>
<td>4.</td>
<td>Tries to please friends</td>
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<tr>
<td>5.</td>
<td>Seeks adults’ approval</td>
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<tr>
<td>6.</td>
<td>Takes part in conversation with others</td>
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<tr>
<td>7.</td>
<td>Shows awareness to others’ feelings</td>
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<tr>
<td>8.</td>
<td>Often impatient</td>
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<tr>
<td>9.</td>
<td>Wants to work independently</td>
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</tr>
<tr>
<td>10.</td>
<td>Begins to learn to control some intense feelings</td>
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<tr>
<td>11.</td>
<td>Tries to justify anger</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>12.</td>
<td>Does not like advice</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Shows love and affection to others</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Respects property rights to others</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Eager to share things and ideas with others</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Eager to take challenges</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Eager to make friends</td>
<td></td>
<td></td>
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<tr>
<td>Research questions</td>
<td>Probing questions</td>
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</tbody>
</table>
| What are the perspectives of teachers and parents towards integrating technology in early years classroom? | What is the importance of technology in today’s world?  
How do you perceive use of technology in classroom teaching?  
How do you think technology is useful for early years children or if you think it is not useful then give some examples?  
How frequent do you use technology at home and for what purpose?  
What are some of the advantages and disadvantages of using technology with early years children?  
How school and you can make technology as meaningful tool for students? |
| How does the school promote technology-based teaching in early years classroom? | What kind of strategies do you use in teaching and learning for the students?  
Are you allowed to integrate technology in teaching & learning process?  
Share examples.  
What kind of gadgets do you use at home?  
What are the supporting factors do you think present in your home related to technology integration?  
Are you allowed to use mobile phones during home time and for what purpose?  
Share any incident in which you have observed that technology has been used for learning purpose of the child and what kind of results you have found? |
| What are the supporting factors needed to promote technology-based teaching in early years classroom? | What are the best ways through which school can promote technology-based teaching in classrooms?  
What are the best ways through which parent can promote technology-based teaching at home?  
As per your view, does your school able to cope with the demand of using technology in classrooms or at home, justify your answer?  
What are the supporting factors do you think are needed to promote technology-based teaching in early years classrooms?  
How can those supporting factors create difference in learning? |
| What are the challenges faced by teachers, students and parents to incorporate technology in teaching and learning process? | What are some of the hurdles you think can make the use of technology difficult at school level?  
What are some of the hurdles you think can make the use of technology difficult at home?  
What are the outcomes you intend to achieve through technology-based teaching, however you also think it’s difficult to achieve?  
How do you think that you can support this program if school will take initiative to integrate technology in your teaching? |
<table>
<thead>
<tr>
<th><strong>To what extent technology contributes to the social development of the child?</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you think it would be easy to get the parents on board for this initiative, justify your answer?</td>
</tr>
<tr>
<td>What is the importance of social development in child’s learning?</td>
</tr>
<tr>
<td>What are some of the factors through which a child can work in the social environment?</td>
</tr>
<tr>
<td>What are the opportunity you give to your child to learn in groups or peers, share some examples?</td>
</tr>
<tr>
<td>Have you ever experienced a lesson in which you taught a lesson through technology and use some social teaching?</td>
</tr>
<tr>
<td>How do you think that teaching through technology can create difference in learning?</td>
</tr>
<tr>
<td>Do you think that technology can help a child to develop socially, justify your answer?</td>
</tr>
<tr>
<td>What are the values you can incorporate through integrating technology in your teaching?</td>
</tr>
<tr>
<td>Do you think that technology can create disturbance in child’s behavior, how?</td>
</tr>
<tr>
<td>What are the drawbacks of using technology in early years classroom with regard to social development?</td>
</tr>
</tbody>
</table>
## APPENDIX F2
### SEMI-STRUCTURED INTERVIEW FOR TEACHERS

<table>
<thead>
<tr>
<th>Research questions</th>
<th>Probing questions</th>
</tr>
</thead>
</table>
| What are the perspectives of teachers and parents towards integrating technology in early years classroom? | What is the importance of technology in today’s world?  
How do you perceive use of technology in classroom teaching?  
How do you think technology is useful for early years children or if you think it is not useful then give some examples?  
How frequent do you use technology at home/school and for what purpose?  
What are some of the advantages and disadvantages of using technology with early years children?  
How school and you can make technology as meaningful tool for students? |
| How does the school promote technology based teaching in early years classroom?   | What kind of strategies do you use in teaching and learning for the students?  
Does your school allow to use strategies other than the ones you are teaching in normal classroom? If yes give examples.  
Are you allowed to integrate technology in teaching & learning process? Share examples.  
What kind of gadgets do you use in your classrooms?  
Share any lesson which you taught using technology in your classroom?  
What is process of raising requisition for teaching through technology?  
What are the supporting factors do you think present in your schools through which you can integrate technology in your classrooms?  
Who are the stakeholders involve in your school play vital role in taking decisions, write their names with their responsibilities?  
Are you allowed to use mobile phones during school and for what purpose?  
What are the available means of technology available in schools?  
Share any incident in which you have observed that technology has been used for learning purpose of the students or teachers and what kind of results you have found? |
| What are the supporting factors needed to promote technology based teaching in early years classroom? | What are the best ways through which school can promote technology-based teaching in classrooms?  
As per your view, does your school able to cope with the demand of using technology in classrooms, justify your answer?  
What are the supporting factors do you think are needed to promote |
<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>What are the challenges faced by teachers, students and parents to incorporate technology in teaching and learning process?</td>
<td>What are some of the hurdles you think can make the use of technology difficult at school level? Have you ever faced issues regarding integrating technology in classroom teaching? What are the outcomes you intend to achieve through technology-based teaching, however you also think it’s difficult to achieve? How do you think that parents can support this program if you will take initiative to integrate technology in your teaching? Do you think it would be easy to get the parents on board for this initiative, justify your answer?</td>
</tr>
<tr>
<td>To what extent technology contributes to the social development of the child?</td>
<td>What is the importance of social development in child’s learning? What are some of the factors through which a child can work in the social environment? What are the opportunity you give to your students to learn in groups or peers, share some examples? Have you ever experienced a lesson in which you taught a lesson through technology and use some social teaching? How do you think that teaching through technology can create difference in learning? Do you think that technology can help a child to develop socially, justify your answer? What are the values you can incorporate through integrating technology in your teaching? Do you think that technology can create disturbance in child’s behavior, how? What are the drawbacks of using technology in early years classroom with regard to social development?</td>
</tr>
</tbody>
</table>
### APPENDIX G
### SCHOOL ASSESSMENT REPORT

<table>
<thead>
<tr>
<th>Language and Literacy</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Listening and Speaking Skills</strong></td>
<td></td>
</tr>
<tr>
<td>shares experiences related to the topic of discussion</td>
<td></td>
</tr>
<tr>
<td>tries to make rhyming words with new songs or words</td>
<td></td>
</tr>
<tr>
<td>initiates conversation with peers and adults</td>
<td></td>
</tr>
<tr>
<td>recognizes different words in the environment</td>
<td></td>
</tr>
<tr>
<td>recognizes vowels and consonants</td>
<td></td>
</tr>
<tr>
<td>speaks simple sentences in English</td>
<td></td>
</tr>
<tr>
<td>demonstrates an understanding of the concepts of singular and plural</td>
<td></td>
</tr>
<tr>
<td>recognizes beginning, middle and ending sounds</td>
<td></td>
</tr>
<tr>
<td>retells the stories in his/her own words</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Reading Skills</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>enjoys reading books and handles them carefully</td>
<td></td>
</tr>
<tr>
<td>reads words independently</td>
<td></td>
</tr>
<tr>
<td>reads new words using phonemic knowledge</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Writing Skills</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>forms English and Urdu letters correctly</td>
<td></td>
</tr>
<tr>
<td>Constructs simple sentences in English</td>
<td></td>
</tr>
<tr>
<td>draws pictures to communicate meaning</td>
<td></td>
</tr>
<tr>
<td>writes names of the days in English</td>
<td></td>
</tr>
<tr>
<td>writes his/her full name in English</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Numeracy</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>sorts and classifies objects by different variants</td>
<td></td>
</tr>
<tr>
<td>knows oral counting from 1-100</td>
<td></td>
</tr>
<tr>
<td>writes number in figures from 1-100</td>
<td></td>
</tr>
<tr>
<td>writes number in words from 1 to 10</td>
<td></td>
</tr>
<tr>
<td>applies knowledge of fractions</td>
<td></td>
</tr>
<tr>
<td>demonstrates an understanding of the concept of before, after and between</td>
<td></td>
</tr>
<tr>
<td>recognizes flat shapes</td>
<td></td>
</tr>
<tr>
<td>Life Skills</td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td>solves sums related to addition</td>
<td></td>
</tr>
<tr>
<td>writes backward counting from 40 – 0</td>
<td></td>
</tr>
<tr>
<td>tells and writes the time (o’clock)</td>
<td></td>
</tr>
</tbody>
</table>

**Personal and Social Development**

| forms positive relations with peers and adults |
| respects others’ opinions, rights and property |
| takes responsibility and cares for self and immediate environment |
| takes turns, shares and cooperates |
| demonstrates increasing self confidence |
| performs physical exercises |
| provides solutions to problems and acts accordingly |
| participates in indoor and outdoor games |
| initiates conversation with peers and adults |

**Knowledge and Understanding of the Environment**

| recognizes the Pakistani flag |
| describes about things in the environment |
| shows curiosity to know more about things in the environment |
| talks about different food groups |
| talks about different seasons |
| recognizes healthy and junk food |

**Creative Development**

| shows enjoyment and a sense of pride in one’s art/craft work |
| cuts with scissors, pastes paper and pictures |
| works confidently with a variety of material (paints, markers etc.) |
| reuses material creatively |
| draws and paints pictures imaginatively |

*Adapted from National Curriculum for Early Childhood Education-2007*