

Assessment of Early Childhood Educators' Competence in Facilitating Scientific Play- Learn Activities in Early Childhood Education Centres in Delta State

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ABSTRACT

The study identified the scientific play-learn activities practiced in early childhood education centres in Delta state and investigated the academic qualifications of the early childhood educators. It also assessed the scientific play-learn skills of the early childhood educators and examined the relationship between early childhood educators' qualifications and scientific play-learn activities facilitation skills in the study area. These were with a view to providing succinct information about early childhood educators' competence in facilitating scientific play-learn activities in early childhood centres in the State. The study adopted a descriptive survey research design. The population of the study comprised all early childhood educators in the State. The sample for the study consisted of 360 early childhood educators drawn from the three senatorial districts in the state using multistage sampling procedure. One self-designed instrument titled "Early Childhood Educators' Competence in Science Play-learn Activities Questionnaire" (ECECSPAQ) was used for data collection. The data collected were analysed using frequency count, percentage, and regression analysis. The results of the study showed that 29.5% of early childhood educators in all the centres practised gravity, 22.3% practised motion, 16.4% practised electricity, 46.4% practised sound, and 24.2% practised air and wind. The results further showed that 16.1 % of the early childhood educators had senior school certificate, 11.4% had ND certificate, 20.6% had TC11 and NCE, 14.4% had HND, 4.7% had certificate in Nursery and Primary education while 10.5% also had certificate in science areas. The results also showed that early childhood educators possessed very low level of scientific play-learn skills (21.90%). The results finally showed a significant relationship of early childhood educators' qualifications on scientific play-learn activities facilitation skills ($F = 2.547$, $p < 0.05$). The study concluded that early childhood educators possessed low competence in embarking on rich scientific play-learn activities necessary to promote science learning in children.

Keywords: Assessment, Early Childhood, Educators, Play-Learn, Competence

INTRODUCTION

Human being once born, possess a brain likened to an empty slate, or a white paper ready to receive imprints from those around him (Locke, 1997). Nevertheless, as time unfolds, they begin to show tendencies to learn and communicate. Being a social entity, family members and

other significant others provide a form of impact that may never be possible to erase, such as sounds of parents' voices, siblings, and other experience within the family (Vouloumanos & Werker, 2007). This signifies the early childhood period as a very crucial one in every human and thus indicates that the experiences gained by the child be aimed at ensuring a holistic and proper development, whilst guiding the child towards positive and rich experiences.

The early childhood period spans from birth to eight years according to the National Policy on Education (2014). Early Childhood Education performs the task of providing learning within an educational institution to children aged three to five plus, prior to entering the primary education (Eshach, 2006). Schooling within this age is just before the child begins any formal education involving standardized evaluation, with activities centered on play. Such play-like activities should have an impact on the mental, physical, emotional, cultural, moral, and social aspect of the child to be termed balanced. Science play-learn activities introduced as early as possible (early childhood period) is nonetheless crucial in ensuring and sustaining the development of lifelong basic skills in science (Esach & Fried, 2005). Research supports science learning among young children as early as possible (Duschl, Schwingruber and Shouse, 2007; French, 2004; Metz, 2009). Discoveries have also shown that exposure of children to science foster and reinforces the understanding of science concepts for later life (Brenneman, 2010; Eshach & Fried, 2005; Metz, 2009). Again, lifelong positive attitudes toward science and becoming scientists are fostered (Edwards & Loveridge 2011; Metz, 2009).

Science is an area of study that affects our day-to-day living in various ways. Regardless of the race, age, or location of an individual, the knowledge of science is paramount. Olajide and Aladejana (2019) accept science as part of everyday life and state that it should be intertwined with real life, by way of connecting daily life experiences into the curriculum so that it is not seen as task associated with laboratories only. From history, science has been a subject of its own. It is a field of study consisting majorly of physical science, earth science (Space science) and biological science (life science), based on the American Early Science Content Standards (Kloos, Baker, Luken, Brown, Pfeiffer & Carr, 2012).

The beauty of science is obvious when an action or response by a living or non-living thing can be explained following the principles of science. It is a field that touches every aspect of life. However, many hold the belief of children being incapable of understanding the scope of science, compared to early literacy. They are therefore deprived or have fewer opportunities to learn science (Early, Iruka, Ritchie, Barbarin, Winn, Crawford, Frome, Clifford, Burchinal, Howes, Bryant, & Pianta, 2010; Greenfield, Jirout, Dominiquiz, Ximena, Greenberg, Ariela, Majer, Michellea, Fucilllo, 2009). Such deprivation over time might lead to variable consequences, one of which is science phobia, especially at higher levels of learning. Apart from the acquisition of knowledge of science, positive habits relevant for daily living such as creativity, grit and endurance are potential qualities children unconsciously acquire for advanced learning (Eshach, 2006).

The quality of science instruction given to preschool children may have a strong relationship with educator's qualification, experiences, availability of resources and so forth. These aforementioned factors may be regarded as components of 'science capital' (DeWitt. J., Archer, L., & Mau, A., 2016). It is a broad term to define all exposure an individual should experience to become competent in science learning and execution. Teachers who do not have science

competence and are not familiar with using science materials do not follow children's science questions and wonder (Greenfield et al, 2009). This may mean that interest in children scientific learning has a strong relationship to the educators' scientific knowledge and experiences, although children are creative, exploring, and inquisitive in nature, they however need educators' input in terms of knowledge and skill in harnessing this inquisitive nature to ensure a fulfilled science-learning. No doubt, children are naturally ready for science, considering their inquisitiveness, open-mindedness, curiosity, and persistent nature about things around them. It is therefore pertinent that children be groomed on the knowledge of science (practices of science), as well as the nature of the knowledge itself, otherwise known as; science epistemology (Bell & St.Clair, 2015). This obtrusively prepares them to confidently wonder, explore, and discover the world around them.

Children's active role in science activities brings about fun, observations, and the thinking of nature as they participate in such activities with excitement. Those who can at least communicate ask questions thrilling to them, such as, why is the sky blue? Why does the rain fall?

Professional bodies such as National Association for the Education of Young Children (NAEYC), American Association for the Advancement of Science (AAAS), National Science Teachers Association (NSTA), along with federal agencies such as the National Science Foundation (NSF) and the U.S. Department of Education (USDE) all emphasize the crucial role science plays in children's development. These bodies propose a range of science concepts and skills that children should know and be able to demonstrate upon entering kindergarten (Brenneman, 2010). Considering this, the content taught in most early childhood centers in Nigeria poses a question on the competence of early childhood educators, being prominent stakeholders in ensuring learning takes place. Since competence will measure the level, at which an individual functions, it is therefore dependent on the qualification, experience and knowledge gained by the individual in a particular job or area of study.

Competence is not equivalent to knowledge alone or skill alone but a combination of both, this agrees with the idea of Glaser-Zikuda, and Fub (2008), Oliva; Fernandez Lozano; Martin Delpozo; Ballesteros; Pesquero Franco; Martin; 2009). Again, Pozo and Olive (2009) view competence as the capacity to articulate and mobilize knowledge, attitude, ways of thinking and managing learning situations. It is the ability to practice theories from concepts/subject matter based on developmental stage of the learners. According to Pozo & Olive (2009), over time, these varying experiences cutting across different aspects of the educator's life led to an increased level of competence and vice versa. Thus, the level of exposure to science-related activities provides useful information on the competent level of such educator in science. Educators' competence in facilitating science activities based on children developmental ages differs in perspective. In order to be competent in conducting science play-learn activities, early childhood educators should be equipped with sufficient knowledge of different components of science education such as geography, physics, biology, chemistry, so as to understand and follow children's fallacies with the aim of providing reasonable answers to their imaginations as well as manage children's style of learning (Kallery, 2011).

In addition, the competence of early childhood educators differs from the qualification acquired, and the training received. Some educators receive training in a specific field of science

(e.g, chemistry); which might mean incompetence in other aspect of science (e.g., Biology). A Research showed that teachers feel competent in Biology, but they do not feel so in Geology, Astronomy, Physics and Chemistry (Aykut, 2006). Early childhood education in Turkey realized these loopholes and thus designed a specific discipline for all early childhood educators known as 'generalist education' It was designed with an aim to expose early childhood educators to all aspect of science to improve their competency in science.

Similarly, Unal and Akman (2006) stated that educators who have received in-service training have a better stand in science instruction.

Furthermore, Kallery (2004) carried out a study to investigate pre-school teachers' opinions about science education and found that educators having inadequate information about science education usually will face difficulties while making explanations to children, they also feel anxious about science teaching too. Teachers thinking that they do not have enough information about science education provided relatively fewer science activities in their daily lesson plan. In another study looking at pre-school teachers' opinion about science education, a study conducted by Özbek (2009), showed that pre-school teachers that participated in the study believed science education at early ages is important and the most common method used was experiment, followed by drama, field trip and observation methods. Another study also revealed attitude and beliefs of teachers as a factor responsible for not engaging children in science activities especially pre-school teachers on-training (Çakmak, 2006). This disparity in belief and practice may be due to several reasons, such as problems encountered in planning and execution of science activities because of inadequate practical exercises during degree programs/training as well as limited science resources for preschools or, the science capital of an educator.

The essence and importance for a productive learning in early years cannot be over-emphasized. Learning centered on literacy and numeracy do not provide sustainable learning. This does not undermine the importance of identification of letters, counting and constructing of sentences. However, preschool education seems to focus on literacy and numeracy with almost a complete phase out of science activities (Greenfield et al., 2009). Meanwhile, upon entering preschool, these surprisingly 'capable scientists' are already biologically and developmentally ready to engage in scientific exploration and inquiry, so that when developmentally appropriate science experiences and activities are provided in early childhood centers, even basic skills in language, literacy, and numeracy are integrated and reinforced (Greenfield et al. 2009). Even though children learn through their own activity, curiosity and exploration of science, to achieve a deeper understanding of science and go past the appearance of science object, they need an early childhood educator with science knowledge (Kallery, 2004)

Research also shows that preschool teachers do not engage children in science due to various reasons. One study showed that early childhood educators have a diffused and vague understanding of science education and only in a limited range introduce children for science questions and phenomenon (Kallery, 2004). While another study showed that the reason for Early Years Educators' less participation in science may be that educators undergo a stricter evaluation on language, literacy and numeracy compared to science (Haslip & Gullo, 2018). One other study showed early childhood educators report feeling less confident about certain

knowledge and concepts in physical science like, sound, electricity, and light, and therefore, shy away from the topic (Uysal, 2007). This lack of competence is not surprising considering the under emphasis of science in pre-service and in-service teacher education (Brenneman, Stevenson-Boyd & Frede, 2009).

Furthermore, classroom observation studies showed that science learning among preschoolers is being neglected, suggesting the predominance of language and literacy in early childhood centers, as earlier mentioned in the preceding paragraph, reporting that preschool teachers' subject area preferences were unrelated to science (86.8 %) and that teachers rarely engaged in formal (4.5%) or informal (8.8 %) science instruction (Tu 2006). Studies using self-report measures have also had similar result. A study by Tu and Hsiao (2008) found that when early childhood educators rated their preferences for subject areas, 45 % of them preferred Language and Literacy, 20% preferred Aesthetic Expression, 10 % preferred Health, Safety, and Nutrition or Gross Motor and Outdoors, and only 5% of the educators preferred Social Studies or Science. This may be a predictor also to the percentages of preschool teachers exposed to science knowledge.

Early childhood centers should serve as a place for nurture and holistic learning. It should be characterized with an enriched environment to build the physical, social, emotional, and intellectual aspects of children, in absence of any of these, the goal of raising an independent adult who can face whatever challenge they come across becomes almost an impossibility.

Statement of the Problem

The absence of proper involvement of science play-learn activities in early childhood centers may result from certain belief of these centers being primarily care-giving institutions, whose objective is to focus solely on the development of social skills. Other cause for this absence may be inadequate instructional methods, a lack of knowledge in science among teachers and the underutilization of children's everyday experience by early childhood educators (Thulin, 2011). Studies have further revealed that as early as preschool, children undergo starvation in science-rich activities, with traditional science instruction provided through textbooks (Trundle, 2014). In view of this, coupled with the obvious phobia for science and little engagement in science subjects among higher learners, the competency of early childhood educators becomes an area of concern or an aspect to fuss about since teachers/ educators are most of the time responsible for the kind of stimulation children receive at this age. Various studies on the nature of science in early childhood education and its relevance to preschool children have been carried out (Randy, Bell & Tyler, 2015). However, literature has not shown much evidence on the competence of early childhood educators' in facilitating science play-learn activities, hence this study.

Purpose of Study

The purpose of the study is to assess the competence of early childhood educators in facilitating scientific play learn activities in early childhood centers in Delta State. The specific objectives of the study are to:

- a) identify the scientific play-learn activities practiced in early childhood education centres in Delta State;
- b) investigate the academic qualifications of the early childhood educators;
- c) assess the scientific play-learn skills of the early childhood educators; and

- d) examine the relationship between early childhood educators' qualifications and scientific play learn activities facilitation skills in the study area.

Research Questions

1. What are the science plays-learn activities practised in early childhood centres in Delta state?
2. What are the academic qualifications of early childhood educators in Delta state?
3. Do early childhood educators possess scientific play-learn skills?

Hypothesis

There is no significant relationship between early childhood educators' qualifications and scientific play learn activities facilitation skills

METHODOLOGY

The study adopted the descriptive survey research design. The study population comprised all early childhood educators in Delta State. A total of 360 early childhood educators constituted the sample size for the study. Multistage sampling procedure was used for the study. The sample was drawn from the three senatorial districts in the state. From each senatorial district, two Local Government Areas (LGAs) was selected using simple random sampling technique. From each LGAs, 30 early childhood education centers were selected using simple random sampling technique. Two early childhood educators were selected from each early childhood education centers using simple random sampling technique. One self-designed instrument titled 'Early Childhood Educators' Competence in Science Play-learn Activities (ECECSPAQ) was used to collect data for the study. The instrument measured qualifications and science play-learn facilitation skills as indices of early childhood science teaching competence. Data collected were analysed using appropriate descriptive and inferential statistics

RESULTS

Research Question One

What are the science play learn activities practiced in early childhood centers in Delta State?

Table 1: Distribution of Respondents showing Execution of Science Play-learn Activities in Pre-school centers

Science Play Learn Activities	Frequency(N=360)	Percentage
Gravity	106	29.5
Motion	80	22.3
Electricity	59	16.4
Sound	167	46.4
Plant and animal growth	116	32.2
Air and Wind	87	24.2
Freezing and Melting	48	13.4
Rocks and Soils	63	17.3

The distribution table above provides information on the science play-learn activities executed by early childhood educators in their preschool centers, it further elicits educator's knowledge on basic science concepts based on the demonstration of science play-learn activity executed. The result of the science play-learn activities as executed by early childhood educators showed

that 29.5% engage their children in play learn activities related to gravity, 22.3% initiated play-learn activities related to motion, 16.4% engaged in play-learn activities relating to electricity. Also 46.4%, which has the highest percentage, said they engaged the children in activities related to sound while 32.2% agreed that they carried out play-learn activities related to plant and animal growth. Also, 24.2% of early childhood educators said they engage children in play-learn activities related with air and wind. Again, 48% of early childhood educators said they engage children in play-learn activities related to freezing and melting. Meanwhile, 17.3% of early childhood educators said they engaged children in activities relating to rocks and soils. Other comment made by some of the respondents who indicated knowledge of basic play-learn activities in the study are supported by the extracts below:

Early Childhood Educators' knowledge on gravity

I throw a ball up and ask children what they see, to describe the concept of gravity (An EC Educator with HND in Business Administration, Oshimili South LGA).

Gravity entails throwing a full and half apple at the same height and telling children to watch them fall at the same time (An Educator with NCE in Physics Education, Udu LGA).

Contrary to the views above, a respondent thus says 'Gravity entails blowing of bubbles into the air and asking children to try catching and breaking the bubbles' (A Female Educator with NCE in Nursery and Primary Education, Udu LGA).

I demonstrate gravity to my pupils by asking them to lift a bucket filled with water and explain to them that the weight felt is because of gravity. (An Educator with NCE in Biology, Ika North LGA).

Early Childhood Educators' Knowledge on motion

I roll a ball from one point to explain to children what motion is about (An EC Educator in Food and Nutrition, Patani LGA).

I demonstrate the concept of motion with car racing on a rough and smooth ground says an NCE holder in English language education from Udu Local Government area.

Interestingly, another educator with HND in Mechanical Engineering, from Ughelli North says; I can demonstrate motion by showing children the movement of molecules with the use of microscope.

Similarly, a respondent stated thus; I can demonstrate the concept of motion by asking children to stack cups and push them to fall, pushing toy cars too (A B.Sc holder in Computer science from Oshimili South Local Government area).

Early Childhood Educators' knowledge on Sound

I demonstrate the concept of sound in science by asking children to read the letter 'a' and count alphabet (an OND holder in Science Lab Tech in Ughelli South).

Also, a similar response given by an educator says 'I talk in the classroom and mimic sounds made by animals through rhymes. (An NCE holder in Nursery and Primary Education).

However, few educators seem to understand the concept of sound in science, following the responses given. One educator says, I use two empty tins connected together using rubber thread and ask pupils holding each end to make sounds and discern the kind of sound produced (A degree holder in Biology Education from Ika Local Government Area).

Similarly, an educator mentioned the use of paw-paw stalk/stem by children in producing sounds from perforations (A degree holder in CRS/POL.Sc from Uwie Local Government Area).

Early Childhood Educators' Knowledge on Electricity

I could ask the children to turn on the TV using the switch to show that it's possible to only watch the TV through electricity says an educator with an O' level from Oshimili South Local Government Area.

In the same vein, another educator says; through switching on and off the classroom's bulbs for light. I could demonstrate to the children the concept behind electricity (An O'Level holder from Ughelli North and South Local Government Area).

However, an educator says he could do this by using dry battery cells with wires to demonstrate the Faraday's Principle (A B.Sc holder in Geography).

This is also similar to a respondent who says, I bring a battery into the class with a bulb to show how light is produced. (An HND holder from Kwale Local Government Area).

Early Childhood Educators' knowledge on Plant/Animal Growth

I make children watch pictures of plants and animals to demonstrate plant and animal growth (An OND holder in Business Administration from Oshimili South Local Government Area).

While another says by just telling them that a puppy grows to dog, baby grows into a boy and then a man, while plants grow into a tree (An educator with a degree in Crs/Pol.sc from Uwie Local Government Area).

I ask children to plant and water beans seed in a cup of soil thrice daily to monitor plant growth (An educator from Ika North Local Government Area).

Meanwhile, one educator says; I use a growth chart instead to explain the mechanism behind plan/animal growth. (An anonymous educator from Oshimili South Local Government Area).

Early Childhood Educators' Knowledge on Air/Wind

I ask children to write in the air as a way of exposing them to the concept of air/wind (An HND holder in Business Administration from Oshimili South Local Government Area).

I demonstrate the concept behind air/wind by allowing children use the hand fan and blow air through their mouth (An NCE holder in Biology/Chemistry from Ika Local Government Area).

One educator says; I ask the children to bring them outside to experience nature (An O' level holder from Patani Local Government Area,

I bring children outdoors to feel the air and wind just before a rainfall in order to demonstrate the concept of air/wind (A B.Sc holder in Botany from Udu Local Government Area).

Early Childhood Educators' knowledge on Freezing/Melting

I ask the children to watch an ice-cream melt (A bachelor holder Library Science from Udu Local Government Area).

Similarly, another educator says by using ice blocks and coagulate placed under sunlight to melt, for children to see (An NCE holder in Biology/ Chemistry from Ika Local Government Area).

Another educator says, by placing butter or ice cubes under the sun. (An O' level holder from Oshimil South Local Government Area. In the same vein, another educator says; I lit a candle and children watch as it melts into wax. (A degree holder in Chemistry Education from Ika North Local Government Area).

Early Childhood Educators' knowledge on Rocks and Soils

I relate soils with their colors to enable children identify colors (An HND holder in Business Administration from Oshimili South Local Government Area).

I simply show children the three types of soils, says another educator (A degree holder in Economics Education from Patani Government Area).

Whereas one educator says, I take children outdoors to see how erosion wash the topsoil and to mining industry to watch how rocks are being crushed by engines (An NCE holder in Business Education from Oshimili South Local Government Area).

I tell the learners to go outdoors and gather different soils into the class, thereafter the children identify them (A degree holder, discipline, was not stated, from Uwie Local Government Area).

In addition, provision for other science activities demonstrated by educators not prelisted by the researcher was given. However, only a handful of respondents (below 36%) provided information to that effect. Few of the early childhood educators attempted the following topics in addition to the previously mentioned science play-activities executed in their preschool centers; Purification, Evaporation, Rusting and Viscosity, Leak-proof experiment, Floating and Sinking. From the result, sound has the highest percentage, which is still low.

Research Question Two: What are the academic qualifications of early childhood educators' in Delta State?

Table 2: Distribution of Respondents by Highest level of Educational Attainment

Highest Certificate Obtained	Frequency(n=360)	Percentage (%)
Senior School Certificate	58	16.1
ND	41	11.4
NCE and TC11	74	20.6
HND	52	14.4
NCE(Nursery and Primary edu)	10	2.8
B.Ed(Sciences)	9	2.5
B.Ed(Social Sciences)	6	1.7
B.Ed(Arts)	19	5.3
B.Ed (Nursery and Primary edu)	7	1.9
B.A (Arts)	28	7.8
B.Sc.(Sciences)	29	8.0
B.Sc. (Social sciences)	17	4.7
Not specified	10	2.8

The result in table 2 above showed that a greater percentage (20.6%) of the population had National Certification of Education and TC11 as their highest qualification, followed by Senior Secondary School Certificate (SSCE) with percentage of 16.1%. Also, 11.4% and 14.4% of the respondents have ND and HND, respectively, as their highest educational attainment.

Meanwhile, those with highest qualification in bachelor's degree in science education and social sciences education have percentages of 2.5% and 1.7% respectively, while those with bachelor's degree in arts education had a percentage of 5.3%. Those with bachelors with single honors include a degree in arts as 7.8%, 8.0% in science and 4.7% in social science. 1.9% and 2.8% of the respondent had 'nursery and primary education at both degree and NCE levels. This confirms the gross-non-professionalism within the field of early childhood education. Furthermore, educators without a degree in education had the highest percentage of respondents and these respondents major in arts. Thus, it is expected that they have limited or no knowledge in science.

Table 3: Distribution of respondents by areas of specialization

Area of Specialization	Frequency (n=360)	%
Sciences	62	17.22
Arts/ Humanities	47	13.06
Management / Social Sciences	116	32.22
Nursery and Primary Studies/ ECE	17	4.72
Not specified	118	32.78

The results from table 3 above throw more light on the educational attainment (knowledge) and skill/exposure to science of early childhood educators in Delta state. The table provides a distribution of the areas of specialization of early childhood educators. From studying the table critically, 17.22% of the respondents have an area of discipline in a science-related field, 13.06% have a discipline in arts/humanities, 32.22% of the respondents major in management/social sciences while only 4.72% of the respondents have a discipline in nursery and primary studies.

Research Question Three: Do early childhood educators possess science play learn facilitation skills?

Table 4: Distribution of respondents based on their facilitation skills in Science-play-learn activities.

Below 40= very low, 40-49= low, 50-59= average, 60 and above=high

ITEMS	Expected score	Observed score	(%)	Remark
Ability to develop science materials.				
I do not develop materials used in science activities, I use ready-made materials	360	141	39.17	Very low
I am not competent enough to develop materials for science activities and need little support	360	63	17.50	Very low
I occasionally develop materials but I still need assistance or support	360	142	39.44	Very low
I have no difficulty in developing materials for science activities	360	44	12.22	Very low
Ability to plan and conduct science play learn activities				
I feel competent enough to plan and conduct science play learn activities and have no difficulty	360	106	29.44	Very Low
I do not feel competent to plan and conduct science activities, however, I thus still need support	360	79	21.94	Very Low

Although I feel competent enough to plan and conduct science activities, I sometimes feel incompetent	360	132	36.67	Very Low
Ability to evaluate children's learning of science				
I evaluate children on the bases of their needs and interest and according to whether the objectives have been reached	360	166	46.11	Low
I do the evaluation considering its contribution to cognitive or mental development	360	152	42.22	Low
Average total of science facilitation skills	0.22(21.90%) =Very Low			

Table 4 above is divided into three sections. Section A reveal early childhood educators' ability in developing science play-learn materials. Section B shows their ability/skill in conducting science play-learn activities, while section C provides the result on the ability of early childhood educators in the evaluation of children's learning of science. In section A, 39.17% of early childhood educators said they could develop materials used in science activities and do not always use ready-made materials. Similarly, 17.50% said they are competent enough in developing science materials but still admitted that they need support. Again, 39.44% of the respondents said they develop materials occasionally; however, they still need assistance or support in this area. However, only 12.22% of early childhood educators said they do not have any difficulty in developing materials for science. In section B, 29.53% said they feel competent enough to plan and conduct science play-learn activities and have no difficulty in this task. While 22.01% said they simply feel competent in the planning and conducting of science activities and are not sure if they need any support or not. Also, 36.77% said although they feel competent enough in the planning and conducting of science activities, they sometimes feel incompetent too.

From the result, sound has the highest percentage, which is still low. The reason for a relatively high percentage may be that sound is a familiar concept taught during literacy (reading of letters). In fact, illustrations as extra information, provided by early childhood educators on how they may execute this activity indicated the above assumptions. Research also supports educators' difficulty in physical science, specifically in sound and electricity (Uysal, 2007).

In addition, misconceptions of certain science concepts were observed from the written responses of early childhood educators. For example, Gravity was perceived as sinking/floating. While Sound as a science activity, was conceived as pronunciation of letters and singing of rhymes. Early childhood educators rarely or poorly executed the science activities listed, showing a low execution of science play learn activities in general. In section C, 46.24% said they evaluate children on the bases of their needs, interest and according to whether the objectives have been reached.

Meanwhile, 42.34% said they evaluated children's learning of science considering its contribution to cognitive development only. In summary, the facilitation skills of early childhood educators in science play-learn activities are somewhat very low, with an average of 21.90%.

Hypothesis

There is no significant relationship between early childhood educators' qualifications and scientific play learn activities facilitation skills.

In order to test this hypothesis, data collected on early childhood educators' qualifications and scientific play learn activities facilitation skills were subjected to regression analysis and the results are presented in Table 5.

Table 5: Regression analysis of the relationship between early childhood educators' qualifications and the scientific play-learn activities facilitation skills

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	21.838	2	21.838	2.547	.001
Residual	2983.316	358	8.573		
Total	3005.154	360			

R=0.785^a, R Square=0.727, Adjusted R Square=0.004, (F=2.547, p < 0.05)

Results in Table 5 showed that there is a significant relationship between early childhood educators' qualifications and the scientific play learn activities facilitation skills in the study area (F = 2.547, p < 0.05). Therefore, the null hypothesis that states that there is no significant relationship between early childhood educators' qualifications and the scientific play learn activities facilitation skills is hereby rejected. The R Square value of 0.785^a indicated a high degree of correlation between early childhood educators' qualifications and the scientific plays learn activities facilitation skills. In addition, the R Square value of 0.727 accounted for a low variation of 72.7% in early childhood educators' qualifications and the scientific play learn activities facilitation skills in the study area.

CONCLUSION

Findings from the study had shown that early childhood educators have low low competence in facilitating science play learn activities and although the knowledge of science is necessary in executing science play-learn activities, the ability level in planning, conducting science and providing an enabling environment to provoke the learning of science in children is low among early childhood educators in the state.

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