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The Impact of
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Early childhood education, synonymous to early learning and development programs is defined by the U.S. Department of Education (2015) as any program that is state-licensed or state-regulated, or providers who provide early education and care to children birth to kindergarten. It also refers to the educational programs and care provided to children birth to kindergarten regardless of the setting or funding source. These are included but not limited to child care center programs and family child care homes. One significant description points to preschool programs that are funded by local or state agencies, which includes the Individuals with Disabilities Education Act funded programs or by the Federal government. Finally, early learning and development may refer to Head Start programs and paid child care providers who are not related to the child and who care for at least two children in a provider setting (U.S. Department of Education, 2015).

Research over the past decades documents the benefits of early learning and development (Barnett & Hustedt, 2003; Golubovic, Markovic, & Perovic, 2015; Kelemen, 2014; Ogunnaike, 2015; Schweinhart, 2003). Research generally points to the benefits of early childhood as a threefold sound investment: academically, socially, and economically. Generally speaking and delineating the academic and social benefits, early childhood education has the potential of decreasing dropout rates and grade retention particularly with low income families. High-quality preschool programs have the potential of decreasing dropout rates and grade retention with middle class students reducing them by approximately 25 to 50 percent. Economically, this reduction in dropout rates and grade retention will benefit taxpayers by saving them money in the long term (Barnett & Hustedt, 2003).

The importance of learning to read and acquiring early emergent literacy skills cannot be overemphasized, particularly in the early years. Delineating key foundational skills is critical in assessing phonemic and phonological performance in young children. Successful reading has been linked with academic performance, school completion, social adjustment, adult learning, as well as postsecondary school opportunities including adult earnings (National Institute on Health and Human Development, 2000). Furthermore, The National Early Literacy Panel (2008), claimed that the absence or presence of emerging literacy skills is predicative of children having subsequent difficulties learning to read. The National Reading Panel (NRP) (2000) acknowledged the importance of phonemic awareness and letter knowledge as the two top entry predictors of reading during the first two years of instruction. The NRP also acknowledged experimental studies evaluating the positive effectiveness of phonemic awareness training in the acquisition of reading of young children.

The expectations of preschool as “the most important grade” as coined by Zell Miller, former governor of Georgia (Barnett & Hustedt, 2003, p. 57) are huge, as students are prepared to become efficient readers, writers and skilled individuals. One expectation is to ensure that they receive effective classroom instruction that will support them in later grades. One way in which this can be done is to ensure that the key predictors of early literacy are taught in the early years (Carson et al., 2013).

The overarching umbrella of phonological awareness is referred to as the sound structure of language. It is an understanding that oral language comprises of smaller discrete units that can be attended to and manipulated. Similar to phonological awareness, phonemic awareness deals with one key aspect of sound, the phoneme. It is an understanding of the various ways in which sounds function with words (Reading Instruction Resources, 2015). Phonemic awareness is

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sometimes confused with the terms phonics, phonetics and auditory discrimination, inventing a new label for an old idea (Yopp & Yopp, 2000). Contrary to this understanding, phonemic awareness it is simply an “awareness that the speech streams consist of a sequence of sounds- specifically phonemes the smallest unit of sound that makes a difference in communication” (Yopp & Yopp, 2000, p. 130). It is also referred to as a subset of phonological awareness and sensitivity that spoken words consist of a sequence of sounds mainly phonemes and that these sounds are linked to written language (Troia, 2004; Yopp & Yopp, 2000).

One inquiry not widely documented in the literature is the evaluation of the effectiveness of early childhood education programming on the phonological awareness development of young children. This research paper therefore examines the effect of curriculum and pre-school programming of an early learning center on the phonemic and phonological performance of students.

The following research questions guided this study:

1. Was there was a significant increase in students’ phonological awareness performance after instruction?
2. How did students identified as coming from a low income household perform as compared to students who were not identified as coming from a low income household?
3. How did students with disabilities perform as compared to students without disabilities?

Method

Settings

Students were enrolled in a private full day early childhood education program in an early learning center. The researcher examined data from two pre-school classes, both collaboratively taught. Each classroom implemented the same curriculum and teaching strategies for seven months.

Participants

The present study examined the pre-test and post-test results of two pre-school classes totaling 33 preschool students with ages ranging from 3 to 4 years. The gender makeup of the students reflected more male students (75.8%) than female students (24.2%) (see Table 1).

Table 1

Gender = Female or Male

Gender	Frequency	Percent	Percent	Cumulative Percent
Female	8	24.2	24.2	24.2
Male	25	75.8	75.8	100.0
Total	33	100.0	100.0	

Students represented were of white, black, and Asian ethnic groups and they came from a mixture of socio-economic backgrounds. Ethnicity makeup of all students was identified per the administrator's report, with the majority being white (66.7%), 27.3 % black and the lowest ethnic group represented Asian (6.1%) (see Table 2).

Table 2

Ethnic grouping of students

Ethnicity	Frequency	Percent	Percent	Cumulative Percent
White	22	66.7	66.7	66.7
Black	9	27.3	27.3	93.9
Asian	2	6.1	6.1	100.0
Total	33	100.0	100.0	

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Disability groupings identified the majority of the population having no disabilities (78.8%). 3.0% identified as having autism, 15.2% identified as having developmental delays and 3.0% identified as having autism and developmental delays (see Table 3).

Table 3

Disability groupings

Disability	Frequency	Percent	Percent	Cumulative Percent
Without disabilities	26	78.8	78.8	78.8
Autism	1	3.0	3.0	81.8
Developmental Delay	5	15.2	15.2	97.0
Autism and Developmental Delay	1	3.0	3.0	100.0
Total	33	100.0	100.0	

Social economic status (SES) groupings identified 27.3% students coming from low income households. This group represents more than a quarter of this population (see Table 4).

Table 4

SES grouping

SES	Frequency	Percent	Percent	Cumulative Percent
No low income	24	72.7	72.7	72.7
Low income	9	27.3	27.3	100.0
Total	33	100.0	100.0	

A total of 3.0% of this population were identified as both having a disability and come in from low income households (see Table 5).

Table 5

Students with SES and disability

SES and disability	Frequency	Percent	Percent	Cumulative Percent
No SES and Disability	30	90.9	90.9	90.9
Low Income and Developmental Delay	2	6.1	6.1	97.0
Low Income and Autism	1	3.0	3.0	100.0
Total	33	100.0	100.0	

Instrument

The Phonological Awareness Literacy Screening (PALS), a scientifically-based phonological awareness and literacy screening and progress monitoring test is used to measure the developing knowledge of literacy skills of preschoolers. It also offers teachers guidance in designing instruction to meet the needs of children. Six broad literacy skills predictive of early and future reading are reflected on the assessment. These include Name Writing, Print and Word Awareness, Alphabet Knowledge, Beginning Sound Awareness, Rhyme Awareness and Nursery Rhyme Awareness. Students' scores from the assessment indicate areas of students' strengths and areas which require instructional interventions. This screening tool is designed to be administered in fall, at the commencement of the academic year and results should be utilized to guide instructional practices and implementation of specific interventions to address areas of weaknesses. Administration in the spring semester serves to evaluate progress (Phonological Awareness Literacy Screening, 2007).

Intervention - Curriculum and Teaching Strategies

The curriculum of this early childhood learning center is based on the principles of developmentally-appropriate practices and consists of four essential elements. These includes a Creative Curriculum, Thematic Units, The Ages and Stages Questionnaire, and the Virginia Foundational Blocks. Instruction is specifically individualized promoting academic, social and physical development. Teaching strategies include play, exploration, direct instruction small and large group discussions, journal writing, games, and field trips.

Instruction aimed at developing phonological and phonemic development is guided by the following instructional objectives:

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- Listening and understanding increasingly complex language.
 - o To comprehend language
 - o To follow directions
- Use of language to express thoughts and needs
 - o Using an expanding vocabulary
 - o Using conventional grammar
 - o Speaking clearly
 - o Telling about another time and place
- Use of appropriate conversational and other communication skills
 - o Engaging in conversations
 - o Using social language rules

Results

Pre-test and post-test data sets of two classes totaling 33 students were obtained from the administrator of the early learning and development center. These were analyzed to compare increases in students' phonological awareness performance after instruction. Data was analyzed quantitatively based on each research question. To compare the effects of the curriculum and teaching strategies on students' phonological awareness performance as measures in the Phonological Awareness Literacy Screening (PALS) test, a paired t-test (with a level of 0.05 significance) was conducted. To compare the difference in performance of students with disabilities and students without disabilities, an independent t-test was conducted (with a level of 0.05 significance). The following provides the results of the analysis of data based on each research question.

Research Question One: Was there was a significant increase in students' phonological awareness performance after instruction?

Data from the PALS test in October 2013 for all students of both classes, as well as data from after instruction were analyzed to test whether there was a difference in students' phonological awareness performance after instruction. A paired sample t-test was conducted and revealed PALS pre-test scores ($M=78.75$, $SD=32.978$) and post-test scores ($M=97.000$, $SD=28.507$). It is also noted that the correlation between the two conditions was estimated at $r = .925$, $p = <.001$ suggesting that the paired t-test is appropriate in this case. The paired sample t-test indicated that scores were significantly higher in the post-test subscale ($M=97.00$, $SD=28.507$) than for the pre-test subscale [$(M=78.75$, $SD=32.978)$, $t(31) = -8.135$, $p <.001$].

Research Question Two: How did students coming from low-income households perform as compared to students who did not come from low-income households?

To test whether there was a difference in means of the PALS post-test results of students who have been identified as coming from low income households ($N = 9$), as compared to the other students who do not come from low-income households ($N = 23$), an independent t-test was conducted. The assumption of homogeneity of variances was tested and satisfied via Levene's F test ($F=3.600$), $F(3.600) = p = .067$. The independent t-test indicated that while total post-test scores for students who were not identified as coming from low income households ($M=102.435$, $SD=24.12$) were higher than the total post-test scores for students identified from low income households pre-test subscale ($M=81.111$, $SD=35.314$). The results revealed there was not a statistical significant difference (at the 0.05 level), $t(30) = 1.784$, $p = .085$.

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Research Question Three: How did students with disabilities perform as compared to students without disabilities?

To test whether there was a difference in means of the PALS post-test results of students who have been identified as having disabilities performed ($N = 6$), as compared to their counterparts without disabilities ($N = 26$), an independent t-test was conducted. The assumption of homogeneity of variances was tested and satisfied via Levene's F test ($F=3.883$), $F(3.883) = p = .058$. The independent t-test indicated that total post-test scores for students who were not identified as having a disability ($M=105.04$, $SD=20.48$) were higher than the total post-test scores for students identified as having a disability ($M=62.17$, $SD=33.90$). However, the results revealed there was not a statistical significant difference $t(30) = 4.069$, $p = .058$. The researcher notes that while the p value = .058 does not indicate a statistical significant difference the test was conducted at the $p=.05$ level. The results suggest a clear relationship but nevertheless a small difference short of being statistically significant at the 0.05 level.

Discussion

The purpose of this research was to examine the effect of curriculum and pre-school programming of an early learning center on the phonemic and phonological performance of students. This research firstly examined whether there was a significant increase in students' phonological awareness performance after instruction. It secondly compared the performance of students identified as coming from a low income household to those who were not identified as coming from a low income households. Finally, it examined the performance of students with disabilities to their counterparts without disabilities.

Findings from the analysis of the data sets revealed a statistical significant improvement in phonological awareness performance of two classes of pre-school students attending this early childhood learning center. Regarding the performance of students from low-income households and students not identified as coming from low income households, findings demonstrated that students not identified as coming from low-income households outdid those coming from low-income households. The difference was however not statistically significant. Finally, findings revealed that while students without disabilities performed better than those with disabilities, the difference was not statistically significant.

An examination of the teaching strategies and curriculum revealed consistency with recommendations made by the National Association of Young Children (1998), that phonemic instruction should support students' reading development when it is coupled with other language components. Such components include vocabulary comprehension, decoding and reading strategies in decoding, and writing instruction. Secondly it was revealed that phonemic instruction was child appropriate consistent to recommendations made by the National Association for the Education of Young Children (1998). Thirdly, an examination of the teaching strategies and curriculum demonstrated consistency with recommendations made by Yopp and Yopp (2000) that phonemic instruction should be viewed as part of the broader literacy program, and phonemic activities should be placed in the context of authentic and comprehensive reading instruction.

Limitations and Future Research

Two main limitations to this study should be considered when interpreting the results. Firstly, the researcher was limited to descriptions of the curriculum and teaching strategies based

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on information provided by the administrator. Triangulation by conducting surveys and/or interviews with teachers may provide greater depth to the analysis and richer conclusions.

Secondly, the research was conducted on 3-4 year old students who attend the learning center.

This limited the researcher in generalizing results to other age groups of this learning center.

Further research is recommended in evaluating the effects of specific teaching strategies on the phonological awareness development in preschoolers particular in students with disabilities.

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