APPROPRIATE MULTI-AGE GROUPINGS WITHIN SUBJECT AREAS FOR LEARNERS IN A MULTI-CHILD HOMESCHOOL SETTING

By

Justina L. Hautamaki

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APPROVED BY: Derek L. Anderson, Ed.D.

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Abstract

This article examines options and motivations for homeschool multi-grouping instructional practices. The author explains multi-age foundations and identifies effective practices of multi-age teaching. Multi-age practices are compared and contrasted with approaches to individual instruction. The author examines each subject area required by Michigan State Statues for homeschoolers. Required subjects are reading, spelling, mathematics, science, history, civics, literature, writing and English grammar. The author provides multi-age grouping recommendations for homeschool families teaching more than one child. Implications for future research and research challenges are discussed.
Chapter I: Introduction

Statement of Problem

Home educating requires pronounced effort to ensure quality education for children. Duvall, Delquadri, and Ward (2004) have observed homeschool parents exhibiting traits and practices of master educators. These practices are developed despite the absence of any formal teacher training. Though they are untrained, parents often develop best practices from experience and familial concern for their children’s education.

The homeschool setting in Michigan is unregulated. For example, norm-referenced tests are not required, and no registration of students or curriculum is required. Therefore, home educators are free to establish the presentation of subjects as they deem appropriate. Decisions may be for the benefit of the children’s learning styles, personality, or educational needs. Considerations are made for the skills and comfort of the parents. Parents also consider the unique needs of the entire family as a unit. Homeschool parents have the freedom to use multi-age teaching settings. Because of these options, many parents choose to teach some subjects multi-age and teach other subjects individually.

A problem in educating multiple children at home is the difference in each child’s developmental level, ability and level of understanding. A teacher/parent cannot simply present one lesson for all the children as in a grade-level classroom. Meeting the educational needs of each child can be difficult if a parent attempts to teach nine different subjects to three or more children individually. Time, materials, space and organization are just a few of the insurmountable problems homeschool parents could face. However, each child’s education remains important. Multi-age teaching becomes a necessity for homeschool settings with multiple children.
Many homeschool families purchase ready-made curriculum for each school-aged member of their family. Often parents reuse elements of a curriculum later with younger siblings. Workbooks or other disposable elements of the curriculum might have to be purchased in order to create a complete curriculum for the next child. These homeschool parents choose to instruct each student individually in their well-defined curriculum. However, some parents choose to teach all their children together at one time in one location. Lessons are presented to a group of multi-age students. Many parents have found this grouping results in less presentation time and increased educational learning for learners.

With a further understanding of the strengths of multi-age teaching and the best presentations for each subject a homeschool parent will be better able to shape teaching practices to best suit learners. A homeschool parent might also use information about multi-age grouping to help choose curriculum and organize the educational day. This paper will consider which subjects should be taught using multi-age grouping and which subjects are better taught individually. This paper will explore factors that influence parental decisions for grouping or individual instruction.

**Research Questions**

What are the most effective grouping arrangements in each curricular area in homeschool settings with multiple children? What factors influence parental decisions for grouping or individual instruction?

**Definition of Terms**

Homeschool is the educational practice whereas, “the child is being educated at the child’s home by his or her parent or legal guardian in an organized educational program in the
subject areas of reading, spelling, mathematics, science, history, civics, literature, writing, and English grammar” (Home School Statue, 1996, p. 1).

Multi-age grouping involves learning activities purposely composed of children more than one year apart in age (Bacharach, Hasslen, & Anderson, 1995). Common terms used to refer to multi-age grouping include mixed-age, heterogeneous, vertical, family, continuous progress, ungraded, or nongraded.
Chapter II: Review of Literature

Michigan State Laws

Michigan Home School Statute MCLA 380. 1561(3)(f) grants exclusion from compulsory attendance to public schools for children from the age of six to the child’s sixteenth birthday. The law allows for two home education options. Option one, which is of relevance to this study, states: “A child is not required to attend a public school if: The child is being educated at the child’s home by his or her parent or legal guardian in an organized educational program in the subject areas of reading, spelling, mathematics, science, history, civics, literature, writing and English grammar.” Michigan law requires no testing, no forms, no notification of school districts or state agencies, and no teacher qualifications for parents.

Of other legal relevance to homeschool families is the Parental Rights Act. This act, effective July 1, 1996, recognizes parents’ and legal guardians’ freedom to determine the education of their children as a natural, fundamental right.

Because Michigan law does not require Michigan residence to register homeschooled children, no means for keeping track of how many children are homeschooled in the state exists. However, researchers have made attempts to determine the number of children homeschooled in the United States. Data was collected from the thirteen states that require homeschool reporting, five nationwide companies and organizations that serve homeschoolers, surveys and relevant published research. After cross-referencing this data, researchers estimate about 2.04 million students were homeschooled in the United States in 2010 (Ray, 2011).

Multi-Age Grouping

The idea of multi-age learning had been present in American public education since the beginning of public education. One-room school houses found in the early American colonies
constituted most of public education. These schools were, by their nature, multi-age. Grade levels were established and differing courses of learning were implemented as deemed appropriate for an age group, but all the ages were exposed to group multi-age instruction. As public education matured and evolved to handle larger numbers of students, individual classrooms were established for each age group (Bacharach, Hasslen, & Anderson, 1994). Some interest in multi-age classrooms has resurfaced in contemporary public education.

Multi-age grouping of public school children has yielded diverse research. In contrast, there is a lack of research from homeschool settings (Duvall, Delquadri, & Ward, 2004). Many books have been published describing how to establish a multi-age public school classroom. Titles include *Multi-Age Classrooms* (Gutloff, 1995), *Learning Together* (Bacharach, Hasslen, & Anderson, 1995) and *Nongraded Schools in Action* (Beggs & Buffie, 1967). Resources like these help public school educators create and defend multi-age classrooms amidst cultural expectations of the superiority of grade-level divisions.

Parents and educators have come to find grade-level grouping to be the most logical, economical and widely practiced. However, educators of multi-age classrooms disagree with the superiority of educational outcomes for this type of grouping (Davenport, 1998; Gutloff, 1995 Lolli, 1998). The popularity of multi-age grouping also has an effect on the longevity of multi-age classrooms in public schools.

Teachers with experience in multi-age classrooms believe students do not think multi-age grouping is all that unusual (Gutloff, 1995). Proponents insist the real world is integrated and school should mimic the real world as much as possible (Gutloff, 1995). Multi-age classrooms are more like the workplace and all of life that students will face after their formal public schooling is completed.
In homeschools, multi-age grouping is often inevitable. Because of the family makeup of homeschools, there are rarely two children in the same grade at the same time. This makes multi-age grouping in homeschool settings logical, economical, and easily implemented.

Most homeschool parents are not certified teachers; therefore, the language they use to describe their teaching is not the same as the language professional teachers use (McKeon, 2010). In a survey-based study McKeon examined the opinions of 682 homeschool parents. She used nonrandom, purposive sampling with snowball sampling to identify survey participants. Participants were affiliated with one of four online homeschool support servers. Her four-part survey asked parents to share reasons for homeschooling, homeschooling style, beliefs about homeschooling, teaching style, and reading methods. The purpose of her study was to determine whether certain family characteristics influence the survey factors. Among the many conclusions McKeon drew from her analysis is a parental preference for the eclectic style of homeschooling. As presented in the survey, an eclectic style approaches education considering multiple needs of the child including emotional, physical, social and intellectual, not just academic needs. McKeon noted many survey respondents indicated their teaching style as one term, however described teaching methods and approaches that indicated a different term. McKeon concluded many homeschool parents do not understand or utilize the formal terminology used by professionals to describe and define teaching styles.

Despite the lack of professional teaching language and understanding, many parents’ educational practices are the same as the practices of professional teachers. Commonly used professional terms that describe the teaching activities in multi-age grouping include concept units, constructivist process, subject integration, flexible grouping, and developmental levels.

**Concept units**
Concept units are useful in multi-age classrooms because students can explore their own interests while relating to the concept being studied (Lolli, 1998). Concept units can allow educators to integrate reading, writing, science, and history. For example, a unit might be based on the concept of interdependence. Year-long studies might include the interdependence of nature, interdependence of people, interdependence of societies and interdependence of natural forced (Pytlik, Kretch, Robinson, & Schwartz, 1997). Topical and thematically units can also be developed.

**Constructivist process**

Constructivist process allows students to make decisions about their own learning. Interests and learning guide future learning. Curiosity is valued. Asking questions and finding answers leads learning. Constructivist theories also support real-life learning, authentic learning activities and subject integration as much as possible (Woolfolk, 2010). Multi-age grouping lends itself to constructivist processes because student groups can jointly guide learning while participating with the entire group.

**Subject integration**

Thematic, topical, and conceptual units allow for subject integration. Some units include activities and studies that touch all disciplines. Teachers using multi-age grouping often find themselves using subject integration because learning in units requires divergent cognitive skills that require the application of knowledge from several disciplines (Lolli, 1998). Some educational theorists believe subject integration reflects real learning that is more easily transferred to life and work performance needs. Conversely, experiences in life integrate subjects and knowledge gained from study of subjects. In his survey-based study of motivations of
homeschool parents, Collom (2005) found academic and pedagogical concerns were the most important motivating factor for homeschooling.

**Flexible grouping**

Homeschool families consisting of more than three children might use flexible grouping throughout their homeschool day. Children might learn as a member of the entire family while participating in tours, outings or presentations. At another time in the day, children might work with a sibling as partners or groups of three. Grouping options include whole-family meetings, parent-lead small groups, child-lead small groups, partners (dyads) and individual. Flexible grouping as part of multi-age education should be fluid and flexible (Hoffman, 2002).

Collaborative peer learning is a vital element in flexible grouping that can increase learning for all members of a group. In collaborative peer learning, each member contributes to learning.

**Developmental levels**

Multi-age grouping requires an understanding of developmental levels. Each child in a homeschool family functions at an individual developmental level. Development includes physiological, cognitive, and emotional abilities. To use multi-age grouping a child’s developmental level does not necessarily have to be evaluated or identified. Children can participate as they are able. Multi-age grouping allows children to participate in tasks according to their developmental level (Hoffman, 2002).

**Student acceptance**

Homeschool settings require acceptance of classmates because the peers with whom homeschoolers learn are their immediate family. Society and human nature provides for the acceptance of “growing up” together in families. Multi-age grouping requires the acceptance of
those classmates as developmental learners. Research shows “students expect and accept differences in ability, and such differences do not make students unequal (Hoffman, 2002, p. 49).” Furthermore, multi-age classroom teachers found, “children did not think multi-age grouping was all that unusual (Gutloff, 1995, p. 22).” Homeschool students’ levels of acceptance of other learners is no exception. Because homeschoolers are accustomed to family activities, multi-age learning scenarios feel natural to them.

**One-on-one Reading Programs**

The appendix provides a brief list of programs developed for use in one-on-one settings. Most of these programs are designed to help students who are not reaching grade-level standards in public school classrooms. Some of these programs are designed with the homeschool parent in mind. For example, *Teach Your Child to Read in 100 Easy Lessons* is marketed to homeschool parents and preschool parents. It is organized to be easily used by any parent who wants to teach their child to read in a close knit, one-on-one setting. The 100 lesson program is based on a regimented, systematic method for teaching reading called DISTAR (Engelmann, 1983).

Homeschool curricula often follow the same reading skills acquisition as many of the publishers of public school materials. Phonemes, letter recognition, phonemic correlation, phonemic awareness, decoding, word attack skills, blending, reading sight words, inflectional forms, word families and fluency are elements of most beginning reading programs (Reutzel, & Cooter, 2011).

Research shows struggling readers have better outcomes from one-on-one reading instruction (Bonfiglio, Daly, Martens, Lin & Corsaut 2004; Lane, Pullen, Hudson & Knold, 2009). Very few programs are marketed to homeschoolers that do not utilize one-on-one reading
instruction. Early reading is difficult to present in multi-age settings because of the individuality of skills including letter recognition, phonemes and blending of sounds to words.

**Spelling**

Traditionally, publishers have presented spelling books for classroom use. Children in early grades use spelling lists presented by the teacher while older students use published books that include sentence exercise, vocabulary practice, and pretest/post test programs that emphasize rote memorization of lists.

Online programs offer lists with interactive lessons for students to complete. Learners can play games and do learning activities. Parents can create their own spelling lists or choose from available lists. Spellingcity.com is one example of a free online program available to any child. This site can accommodate all ages and spelling abilities.

Conversely, some home educators choose to eschew spelling as a separate subject and integrate spelling into general learning in all subjects, specifically language arts, and writing. Some home educators believe spelling skills are best acquired through extensive and expansive reading (Seid, 1999). In a long-term case study presented in workshop form, Seid observed one homeschool student several years prior to entry into public school and one year post entry to public school. The subject won the public school spelling bee his first year back in public school. Sied noted the subject had never formally received spelling instruction in his homeschool curriculum. After evaluating the subject’s homeschool education, Seid (1999) concluded the case study subject’s skills had developed through extensive reading and writing.

**Mathematics**

Most mathematics curriculum on the market are grade-level specific. Many programs including Singapore, Saxon, and Houghton Mifflin provide workbooks designed for use by
individual children. However, group activities are often included in the workbooks. Many of these group activities can be implemented in a multi-age setting.

Multi-level math is mostly seen in the presentation of math applications. Word problems, story problems and the use of math concepts are easily adapted in multi-age teaching. For example, one multi-age teacher used a quilt in a thematic unit on family. Children were taught to use protractors to measure the angles of the square they wished to reproduce (Davenport, 1998). Davenport’s research in multi-age classrooms included evaluation of children’s mastery and application of math skills and concepts by evaluating the angles produced in the completed quilt square.

However, some research shows math concepts are rarely linked to children’s life experiences. Mathematics has been considered an abstract, theoretical body of knowledge that requires a logical, systematic approach in teaching. Researchers are concerned that math applications are rarely taught in math instruction in public or homeschools, despite research that supports increased learning outcomes when applications are taught (Jacque, 1996). In his observational study involving homeschools and public schools, Jacques found very few connections drawn between students’ experiences and their math learning. Reasons for the disconnect were not clear other than traditional expectations and attitudes toward math as a logical, rational, set of skills that must be learned in increments. The National Council of Teachers of Mathematics has made efforts to foster a constructivist approach to math understanding. Jacques study might yield different results in today’s classroom just fifteen years later. However, updated research on homeschool math application and instruction is limited.
Science

An approach to science instruction relying solely upon grade-level textbooks will lead away from multi-age instruction. These books are written at the reading level of their intended grade. Questions and answers reflect the thought processes expected at the indicated age.

However, many homeschool educators use science curriculum marketed to any parents for use with children who are especially interested in science. Programs include Potato Chip Science (Kurzweil, 2009) and The Young Scientists Club (2002). These programs often include apparatus and instructions for illustrating scientific concepts.

Multi-age science instruction is not likely to present scientific information and practices in the same order as state guidelines might dictate. Following state standards for science education is not an element of Michigan state homeschool requirements. Therefore, many homeschool families can choose to use these alternative kits and programs to lead science instruction. Kits can be used effectively in multi-age classrooms to achieve learning for multiple grade levels simultaneously.

Science is often one of the most desirable subjects to teach in a multi-age setting provided the age range of learners is not too broad. A seven year-old student can enjoy looking through a microscopes though his lab sheet might look quite different form his 12 year-old sibling’s sheet. Science curriculum on the market is generally not advertised as multi-age, so parents may need to tailor projects to suite their learners.

Many home educators purchase science textbooks and science activity kits from homeschool publishers. Other parents select curriculum from a number of sources. Chemistry: Pre-level I by Dr. R.W. Keller is a textbook written by an accomplished chemist. From her own research background and experience with children, she wrote a textbook, lab book and teacher’s
guide geared toward the youngest scientists. The textbook is designed to be read with multi-age
groups of homeschool children from kindergarten through third grade. Each companion lab
involves multi-age learners in riveting experiments. All materials for labs are common household
items or can be purchased at local grocery stores. Information and activities are divergent and
appeal to multiple types of learners. Keller’s (2007) intention in writing the series is to teach
science the way scientists do science.

Multi-age classroom teachers found science-related, year-long themes that are age
appropriate and real-world related, work best (Davenport, 1998; Lolli, 1998). Activities should
also foster a constructivist learning process that extends beyond the textbook. Lolli’s conclusions
are drawn from observational study of her own multi-age classroom made up of 10- to 13-year-
olds. Davenport’s conclusions are drawn from her work with seven multiage classrooms in the
lab school on the campus of Eastern Oregon University.

History and Civics

Traditionally these two subjects, with the addition of geography and economics,
embrace the social studies. The wording of Michigan homeschool law separates these as
specific subjects. Public high school education also separates these subjects into individual class
offerings. Michigan law is intended to cover all grades of home education for all ages six
through sixteen and does not identify subjects taught in elementary verses high school. For the
purpose of this research, we will consider the subjects combined in one heading of social studies.

As with other subjects in multi-age education, social studies is often taught through the
use of unit study. Constructivist process and subject integration form the lessons and activities of
social studies education for multi-age teaching. Instruction might include field trips to historical
places, followed by the reading of a work of juvenile historical fiction. Educators may guide
students to research materials like the Eyewitness books, encyclopedias or web sites to help answer questions.

Some homeschool families participate in programs for historians or travelers. Many families travel regularly to expand their children’s social studies knowledge with rich and diverse experiences. Even social studies textbooks “encourage students to contrast and compare their personal experiences with those of other people and communities” (Jacque, 1996, p. 2).

Individual instruction in social studies in homeschool settings might involve individual workbooks for geography, map skills, political structure, presidents/government. Publishers offer graded social studies textbooks as well.

**Literature**

No subject is as commonly integrated with other subjects as literature. One particular homeschool company offers an entire literature-based curriculum for purchase. This “core curriculum” includes dozens of novels and other literature at age appropriate reading levels. Learners are offered literature in nearly every subject area in the Sonlight curriculum.

Literature instruction is often an extension of reading instruction. Therefore, considerations for multi-age teaching and individual teaching are similar to those considerations for reading instruction. Concepts in literature instruction that extend beyond reading instruction include comprehension, elements of a story, genre, history of literature, impact of literature and literature enjoyment (Harp & Brewer, 2005).

**Writing**

Writing instruction is two-fold. Each element should be considered separately for multi-age grouping. First, writing includes handwriting or penmanship. Workbooks are offered at various levels for instruction in penmanship. Other approaches include copying texts and other
tactile writing practice. Second, writing includes composing. Approaches to writing instruction stem from assigned writing prompts to free journaling and other authentic writing opportunities (Michigan Reading Association, 2007).

Very few individual writing programs exist. Workbooks offer prompts appropriate for use with multi-age groupings. Generally, assignments or writing opportunities are presented to all learners while expectations for writing production are adjusted to fit ability levels.

Author studies, writing workshops, process writing instruction, and writing traits can be presented individually or multi-age. Resources for teaching writing are abundant and rarely divided by age. Writing instruction also lends itself very well to integration with other subjects (Davenport, 1998; Lolli, 1998).

**English Grammar**

Individual workbooks are often a part of English grammar instruction in multi-age and individual homeschool curriculum. Tutoring companies like Sylvan Learning Centers offer workbooks for mastering English language and grammar governances. Their series called Score Mountain Challenge takes students on a mountain climbing adventure (Serrano, 2007). Workbooks accompany web learning activities but can also be used independently for individual grammar instruction. Many publishers offer textbooks with accompanying worksheets.

Conversely, many educators choose to integrate English grammar instruction with writing instruction and even literature instruction. Grammar lessons are taught in mini-lessons and practiced in authentic writing activities.

A third option for English grammar instruction is a combination of both systematic workbook practices and authentic application of grammatical concepts. Both integrated grammar and hybrid grammar instruction show great application in multi-age groupings. Workbooks are
often used in individual homeschool instruction. As with mathematics instruction, children may work simultaneously in their own individual workbooks while siblings work in different grammar workbooks. However, this is not true multi-age grouping. Some multi-age learning and teaching may occur, however, if students are permitted to “help” siblings. Often dyads and student-lead groups spring from individual textbook work time.

**Factors Influencing Parental Decisions**

Homeschool parents find ways to make things work for their individual families. Parents utilize any resources available to them. Any benefits a parent has are utilized for the benefit of the children’s education.

Collom (2005) studied homeschool parent motivation and student achievement. Two-hundred thirty-five homeschool parents/teachers (representing a total of 391 students) completed the computer survey. Parent responses were linked with student achievement scores from California’s Standardized Testing and Reporting Program. Sixteen motivations were analyzed and the following four broad categories emerged: dissatisfaction with the public schools, academic and pedagogical concerns, religious values, and family life. In the area of student achievement, only reading, language and mathematics scores were considered. Collom considered data identifying the following parent background variables: educational attainment, age, race, gender, household income, spouse involvement in home education, previous involvement with the homeschooling community, number of years home educating, religiosity and self-reported political identification. One of the most significant findings from Collom’s study is the lack of simplistic typologies. No single motivating factor or parent background factor predominately influenced student achievement. His conclusions included an urging for awareness of “the diversity of those who home educate their children (Collom, 2005).
**Special needs and desires of children in the family.**

Special needs can determine individual course of education. This might include special services outside the home including physical therapy, speech therapy, or occupational therapy. Some parents choose to homeschool because of their child’s special educational needs (Duvall, Delquadri, & Ward, 2004). These parents must consider children’s needs when grouping for instruction.

**Parental teaching style**

Every parent has a teaching style. McKeon (2007) found a strong relation between religion and preferred teaching style of the parent. She suggests, “A parent’s instructional style is motivated more by their philosophy of learning than by their actual educational encounters” (p. 133). Teaching style also includes attention to parent’s goals for children. If a parent hopes her child will work cooperatively with others in a team, multi-age grouping would be advisable as much as possible. If a parent hopes a child will concentrate on individual achievement and advancement, individual instruction is applicable. Other parental goals and life-philosophies influence age-grouping decisions (McKeon, 2007).

**Chapter III: Results and Analysis Relative to the Problem**

Pervading research findings on multi-age grouping is the underlying needs of the individual family and its members (McKeon, 2007; Collom, 2005). Analysis shows groupings tend to fit the comfort level of parent and students. Homeschool parents have willingly taken
responsibility for educating their children; therefore, the educational methods they choose for their children should fit their family’s comfort levels, life-style and goals.

**Multi-age Grouping by Subject**

Of the subjects cited in Michigan’s Homeschool Statute, science, social studies, literature, spelling, English grammar, and writing lend themselves readily to multi-age group study. These subjects can be presented in integrated units with constructivist process that underscore multi-age grouping.

Parents must make curriculum decisions with their grouping preferences in mind. The myriad of diverse offerings in both science and social studies curriculum options, gives parents the freedom to choose multi-age grouping instruction in these subjects.

Literature, spelling, grammar and writing instruction presented through topical, thematic or conceptual unit studies can allow for multi-age grouping in these subjects as well. If a homeschool parent decides to teach any of these four subjects using multi-age grouping, learning outcomes can be high.

Research on reading instruction suggests programs are made for grade-level or one-on-one instruction tailored to a child’s increasing development of reading skills. Mathematics research and curricular offerings indicate the same striated, leveled progression of knowledge acquisition.
Chapter IV: Conclusion

Recommendation

As homeschool parents contemplate best practices for teaching their children, significant considerations should be made for their own teaching styles and student’s needs. Contemplation of a parents comfort level with age grouping is necessary for homeschool parents. Consideration must include curriculum selection to support multi-age grouping decisions.

Individual curriculum subjects

Mathematics and reading instruction analysis reveal a strong need for individual age-appropriate instruction. Home educators should consider this when planning grouping arrangements for instruction.

Reading grouping

In the early phases of reading instruction when readers begin to recognize phonemes, individual instruction is advisable. Children benefit from specific individual attention to their expanding knowledge of letter recognition and phonological awareness. Instruction tailored to their reading skills acquisition level yields the greatest academic outcomes. When choosing a reading curriculum, home educators should choose a one-on-one program with ease of use.

Later, reading instruction can be organized in multi-age units and thematic units. Reading levels can increase through integration of reading across the curriculum with very little specific instruction in reading at all. Parents might consider mini-lessons on skills as teachable-moments arise. Comprehension skills instruction should be maintained throughout the grade levels, however. Because each child can utilize comprehension skills at their own understanding level, comprehension skills are easily taught in a multi-age setting.
Thematic units can be used with students of all reading levels. Educators have also used read-alouds to help students enjoy literature that is far beyond students’ independent reading level.

Multi-age reading instructions can also be integrated easily into every other discipline. With increased popularity of literature-based curriculum, home educators can choose to teach reading as an integrated subject, whether teaching multi-age or individual reading.

Mathematics grouping

An underlying philosophy in math education seems to pervade mathematics instruction in public school and homeschools. Math requires foundational knowledge that must be built upon in a systematic way. This philosophy leads homeschool parents to present math with an individual approach. However, dyads and group work might prove to be the most effective method for grasping math applications and implementing them to real-life learning. Often multi-age, integrated activities require math. Math concepts can be taught as teachable-moments arise in a homeschool experience. Homeschool families can have all children doing math simultaneously from different textbooks. A parent can present mini-lessons to each child based on the required lesson for the day. Some parts of math instruction might allow for multi-age grouping, while other parts are done individually. For example, children might do “mad minute” during the same three-minute period. One child might have multiplication facts, while another child has addition facts. This is not true multi-age learning; however, it is a blending of math instruction to suit a family setting.

Parents might also consider a true constructivist approach to math education. Math concepts can be taught by starting with life experiences and learning the math to accomplish
tasks or solve problems. Conversely, instruction can start with math concepts and apply life-experiences to reinforce learning.

**Areas for Further Research**

Future research might include observation and evaluation of the teaching practices of homeschoolers. Little observation has been recorded of actual homeschool practices.

Observational research to identify academic involvement could include data collection involving amounts of academic engaged time, questioning strategies and response times. These factors have been identified as significant factors in learning (Duvall, Delquadri, & Ward, 2004). Large sample sizes would be desirable, though difficult. Participants would include homeschool families with multiple multi-age children who use various forms of grouping.

Ideally, a survey with a very large random sample size could reveal actual grouping practices of multi-child homeschool families. Difficulty in identifying participants might make this kind of research laborious and costly. However using an approach similar to McKeon’s database access could be possible (2007). Data collection could include a multiple choice survey including family background, number of children homeschooled, types of instructional grouping employed broken down into subject categories. A well-crafted survey would be necessary. Data analysis would require quantitative analysis of survey responses. Content reliability should be determined and content validity must to be evaluated by other experts in the field of teaching and homeschooling. This type of large-scale research would be appropriate as a doctoral dissertation or for a homeschool interest group.

**Challenges in further research.**

Further research may continue to prove challenging because homeschool families often do not like to participate in research if the research organization is not one they trust. Also, many
homeschool practices are so unlike public school practices that they are difficult to quantify and qualify. A particular philosophy of homeschooling (referred to as “unschooling”) does not involve objectives or promote the use of ordered curriculum for any subjects. These homeschool families reject organized attempts to formalize real-life learning.

Another challenge to researchers, especially in states like Michigan, is the lack of documentation of homeschoolers. Where no registration is required, few databanks exist from which researchers can draw. True representative sampling might be impossible. Very small sample sizes can also prove a difficulty for researchers.

**Conclusion**

Homeschool parents take full responsibility for their children’s education. Most parent/educators take this responsibility very seriously (Collom, 2005). As a result, home educators are often looking for best practices in the best interest of their children. They make decisions based upon family needs and students needs. They may also consider educational guidelines and their own desires and goals for their children. Decisions about multi-age grouping in each subject is as individual as each homeschool family. The newest homeschoolers appear to be mostly motivated by academic factors (Collom, 2005).
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Appendix

Reading Programs Designed for One-on-One Implement

(research in which program was reviewed)

DISTAR, Teach Your Child to Read in 100 Easy Lessons (Engelmann, Haddox, Bruner, 1983)

UFLI, University of Florida Literacy Initiative (Lane, Pullen, Hudson, Knold, 2009)

Sound Partners (Marchand-Martella, et al., 2002)

Bob Jones University Press (Apple, 2007)

Christian Liberty Academy (Apple, 2007)

Alpha Omega Publications (Apple, 2007)

KONOS (Apple, 2007)

The Weaver Curriculum (Apple, 2007)

RISE (Taylor, 2003)

PALS (Sporer, 2009)

K-PALS (Sporer, 2009)