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Presented by Kids Play Math Team:
Jenny Lerner M.Ed., Alvaro Arias, Ph.D.,
Jeff Farmer, Ph.D., and Mario Lopez, Ph.D.

REGION XII EARLY MATH INITIATIVE

Report from Kids Play Math
to FHI 360



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1. Project Overview

This project involved a partnership between the Kids Play Math (KPM) project and FHI 360 to support the implementation of the Kids Play Math program in migrant Head Start classrooms. The objective of the program was to *improve concept development and quality of feedback in early math in Migrant and Seasonal Head Start (MSHS) programs.*

The program involved a partnership model, with a combined online and face-to-face job-embedded professional development model.



The major elements of the project were:

- ❖ Programs paid for teaching staff and coordinators, and teaching-related staff to take the Kids Play Math online course in early mathematics.
- ❖ FHI 360 paid to provide follow-up and face-to-face training in the Kids Play Math EMILI instrument.

The expected outcomes of the project were:

- ❖ 85% completion rate
- ❖ Ongoing improvements in early math instruction as assessed by programs
- ❖ Improvements in math instruction as assessed by KPM staff

These outcomes were assessed using the following evidence:

- ❖ Participant work products within the online course and course completion
- ❖ Participant comments during follow-up phone calls and face-to-face EMILI Training.
- ❖ Participant comments on training evaluation forms.
- ❖ Participant surveys (at end of online course, and at end of face-to-face training)
- ❖ Coordinator responses to coordinator surveys
- ❖ FHI 360 consultant/KPM staff classroom observations of participating teachers

Elements of the Kids Play Math Program

PROGRAM ELEMENT	PROVIDED BY	PAID FOR BY	PURPOSE
Online course	KPM	Programs	<i>Provide job-embedded professional development in early mathematics</i>
CEU Credit	University of Denver	University of Denver	<i>Appropriately acknowledge teachers' work and learning</i>
KPM Educational Software	KPM	KPM	<i>Support deeper learning of mathematics by children through interaction with software, teachers and other children.</i>
EMILI Training	FHI 360 Consultant/ KPM Staff	FHI 360	<i>Deepen teachers' understanding and skills in the key area of instructional support (CD, QF, LM).</i>
EMILI Materials	KPM	KPM	<i>Provide teachers with an instrument to support lesson planning and instructional improvement</i>
Classroom observation and feedback	FHI 360 Consultant/ KPM Staff	FHI 360	<i>Provide feedback to teachers and coordinators regarding the quality of implementation of research-based math activities and the elements of instructional support.</i>
Conference call (one per program)	FHI 360 Consultant/ KPM Staff	FHI 360	<i>Support participants as they move through the course, and learn how participants are progressing.</i>
Reports to coordinators and FHI 360	FHI 360 Consultant/ KPM Staff	FHI 360	<i>Provide real-time feedback regarding the progress of the participants.</i>

For more information on Kids Play Math and the Early Math Initiative, see Appendix III.

2. Major Results

This project has been very successful. All project outcomes were met or exceeded, and there were additional positive impacts that were observed by programs, ECE specialists and FHI 360 consultant/KPM staff, providing additional evidence that the overall objective was met. Teacher impacts were significant and are ongoing. With the integrated, job-embedded professional development model, significant changes in instruction were

achieved, are ongoing, and are, in many cases, likely to be permanent. Positive impacts on children’s learning in participating classrooms include increasing mathematical discourse and engagement among children, as well as effects on literacy instruction, dual language and special needs students. The model is clearly effective and scalable. Kids Play Math recommends it be expanded.

3. Teacher Impacts

This project has had effects on teacher attitudes toward and understanding of early mathematics and classroom mathematics instruction that are both deep and broad. Most teachers implemented all the assigned activities, even the optional ones—as indicated by responses to questions in the online discussion forum, reports from coordinators, and classroom observation by Kids Play Math staff.

Teacher participation in and completion of the online course

During the project 82 teachers started the course, and 75 finished (91%). All participants receive CEU’s upon completion of the course. Teachers in the Michigan program received college credit.

Teacher responses to multiple-choice survey questions.

28 of the 72 teachers completing the course at the time of the report answered the survey (40% response rate). The results of the survey were very positive, exceeding expectations of the Kids Play Math staff. For example, in response to the question “How helpful were the classroom activities?”, 100% of the teachers chose the response “They were very helpful and it was the right amount of work.”

The answers to other questions indicated that the teachers found the course to be effective, helpful, appropriately challenging, easy to navigate, etc. Responses to a number of questions indicate that the teachers understood and were using what they had learned in the course. For the complete results of the survey, see Appendix I.

Teacher attitudes toward and understanding of early mathematics.

Teachers were enthusiastic about what they were learning. There were no negative comments received about the program, and few neutral ones. Teachers were highly engaged in both the online course and the EMILI training. Some comments:

“ [It helped] me to improve my vocabulary in the math area. ”

“ I get a lot of ideas to implement in the class. ”

“ I really appreciated the lesson analysis worksheets—great practice and awareness of how to make my lesson plans more intentional. ”

Teachers’ use of research-based mathematics instruction.

Each of the four lessons in the online course included an assignment to implement specific research-based mathematics activities in their classroom. All activities assigned or provided in the online course were adapted and implemented by numerous teachers who participated. In addition, some teachers created their own activities that are consistent with early math principles. For some examples of activities that teachers created, see Appendix II.

Teachers’ use of advanced instructional support techniques.

One of the most common observations and comments involved extension questions that provide high-quality feedback and support concept development. Teachers were asking questions like:

How do you know?

Can you explain?

Do you agree?

Can you count again?

What will happen if we put one more there?

What will happen if we take one away?

It is clear from our discussions with teachers and their comments that the course and the EMILI training has often completely changed and expanded their notion of concept development:

“ Yo voy a cambiar la manera de planear mis actividades en todas las areas, sobretodo en Math. Ahora voy a tratar de extender un misma actividad hasta que los niños tengan el concepto de lo que yo quiero que aprendan bien definido.

[I will change the way I’m planning my activities in all areas, especially in Math. I will now try to extend the same activity until the kids get the concept I want them to learn.] ”

Kids Play Math Staff Observations

We observed, in every class visit, in every program:

- Teachers using multiple representations of mathematics (e.g. 5-frames, fingers, movement)
- Teachers using extension for feedback and concept development
- Teachers using mathematics learning in large groups, centers and transitions
- Teachers using research-based math activities from the online course (e.g. Mouse and Cookie Jar, Una Carrera Grande, Hula Hoop)
- Children using the educational software, often in both English and Spanish
- Math activities in both English and Spanish

In most of the classes observed:

- Coordinators were coaching and supporting teachers in math
- Teachers were moving around during center time, interacting with children about math.
- Teachers were integrating math and literacy

In several classes, the staff observed:

- Teachers working with small groups on math
- Teachers working with children at the computer on math concepts

Several teachers were planning on disseminating information on Kids Play Math and the software to families, possibly through family math nights.



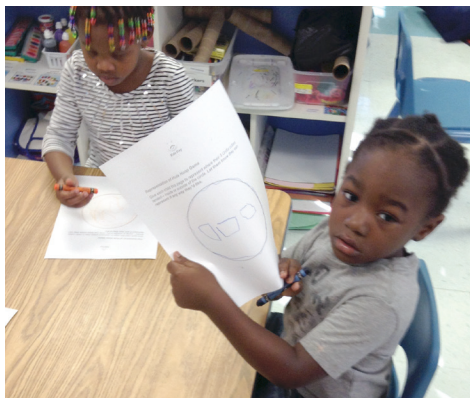
4. Impacts on children's learning

With about 40 classroom teachers completing the course, we know that there are direct instructional impacts on at least 650 children at this moment. However, since the majority of the instructional changes are clearly ongoing and likely to be permanent, this is actually the minimum number of children who will be affected each year for the remaining time in participating teachers' Head Start careers.

Engagement in mathematics learning

We found, in teacher comments and in observations, that children are highly engaged in both the classroom activities and in those provided by the educational software.

“Our children responded positively! I cannot state that enough. All children want to feel successful when counting or showing the ones they are close to that they can say all of their numbers!”



Individualization

When teachers do not know about the progression of learning in early mathematics, it is not possible to appropriately individualize instruction. Through the Kids Play Math program, teachers learn about the steps that children go through as their learning progresses, and how to help them move through these steps. This gives the teachers the ability, often for the first time, to effectively individualize instruction.

“I observed a teacher individualizing math for the children in her classroom. They were using dice dots during a transition. The first few children rolled one die and counted the dots. When it was a more advanced student's turn to roll the teacher said, “Let's use two dice.” The child counted the dots on both dice separately. The teacher asked her to count them all together, which she did with assistance.”

Integration of math into all areas

The research-based math activities provided by Kids Play Math are designed to be integrated into all areas of instruction. As noted above, Kids Play Math staff have verified through observation, that the activities teachers have learned and created are being used in large group, centers, transitions, etc.

Literacy integration

Kids Play Math staff observed numerous cases of teachers integrating math vocabulary into the word wall, or using literature that involves early mathematics with children.

“ The math vocabulary section helps bring focus to math activity objectives and is also with our word wall words. ”

Support for dual language students

Teachers report using visuals and movement which supports dual language students. Children are using the bilingual software in both languages, often starting in Spanish and switching to English later.

Support for autistic students

Kids Play Math staff observed that autistic children from two programs were able to use the educational software, and became very involved. One teacher reported that one of the children had never responded to questions about math. By using the assessment feature of the software, the teacher was able to see where the child was in both numeracy and geometry.



5. EMILI Training

The two major parts of the project were the online course and the EMILI Training. 76 of the 82 course participants attended EMILI trainings. The EMILI (Early Mathematics Instruction and Learning Instrument) was designed by Kids Play Math staff to support teachers to design, implement and improve instructional support in concept development, quality of feedback, mathematical language and instructional learning environments for mathematics. It is fully integrated with the Kids Play Math online course: It is not a stand-alone instrument, but rather designed to help teachers specifically internalize and implement their learning from the course.

The EMILI training, like all aspects of the Kids Play Math program (course, software, etc.) is designed to be hand-on, interactive and practical:

“ I think instructionally being hands on and visual [helped me to] internalize it. Also being in groups and peer learning helps me to internalize this math training. ”



The EMILI Training was provided to programs at the time when the majority of teachers in a program were halfway through the early mathematics online course. It has, in the view of the Kids Play Math staff, significantly deepened the already significant impacts of the online course. Teachers and coordinators report:

“ Teachers and coordinators have used the EMILI to develop lesson plans in early math for the daily routine of the classroom. ”

“ I’ve found it helpful in terms of advancing their [teachers’] instruction to the “next level” and coaching them into the kinds of concept development that we want to see. It’s also been helpful in giving them concrete examples of how to expand quality of feedback. ”

“ I’ve heard that EMILI helps them [teachers] organize their thinking and make more sense of how it all works in the classroom. ”

“ Having the EMILI instrument is useful in providing feedback after CLASS observations. It helps to show how teachers can take their instruction to the next level. ”

“ En mi opinion, es un marco de referencia o una guía que facilita la planificación hacia el aprendizaje. Este currículo integrado se apoya en tres dimensiones importantes de CLASS (Instructional Support, Quality Feedback, Concept Development). Es flexible y ajustado de acuerdo a las necesidades del niño. Es todo centrado en el niño y en materias de contenido. Para mi es como seguir pasos del principio al final para enseñar a los niños acerca de diferentes conceptos matematicos (counting, shapes, patterns, take away, add, etc.).

[In my opinion, this is a point of reference, or a guide that facilitates planning for learning. This integrated document supports three dimensions of CLASS (Instructional Support, Quality Feedback, Concept Development). It’s flexible, designed to match the needs of the child. It’s completely centered on the child and content. For me it’s like following steps for teaching children about various math concepts from beginning to end.] ”

For a look at the quantitative results of the evaluations of the EMILI training, see Appendix I.

6. What made this project so successful?

The success of this project exceeded the expectations of the Kids Play Math staff. Here is our analysis of the important aspects of the project that contributed to its success.

1. Program selection and investment

Because programs self-selected for participation, we worked only with programs that were highly motivated to fully participate. When programs are selected at other levels of Head Start, they may not be as interested in embracing the program. Because the programs themselves had to pay for the online course portion of the cost, they were invested in making good use of what teachers and coordinators learned. In our implementation experience so far, having the programs responsible for the cost of the course greatly improves completion rates and other positive outcomes. In addition, because teachers are required to adapt and implement the activities within their own classrooms, they gain a significant level of experience and ownership, making it much more likely that the changes will be permanent.



2. Integration

There were two levels of integration in this project, both of which were vital to its success.

• Partnership between FHI 360 and KPM.

The partnership between Kids Play Math and FHI 360, with FHI 360 paying for the EMILI Training portion of the project, and with ECE specialists following up with programs, worked very well. This kind of partnership could support many more Head Start programs, if appropriately funded.

• The combination of two types of professional development, neither of which is as effective alone, in a program-supported cohort model.

It is known that one-day training visits by experts generally have minimal impact on changing teachers' classroom instruction. On the other hand, completion rates for online courses are very low.¹ In this model, the training, coming as it did in the middle of the course, encouraged teachers to do the online work in order to be prepared; after the training, the additional online lessons allowed the teachers to implement what they learned. Program support, in the form of coordinators taking the course with teachers, provided both support and incentive for instructional change. Finally, implementing the model with cohorts improved the job-embedded learning experience of the online course, and made it possible to schedule the EMILI training in the middle of the course.

¹Passing rates for video-based online classes are generally low. For example, in 2012 San Jose State University (SJSU) partnered with Udacity, one of the leading online education providers, and offered three video-only versions of SJSU courses. The passing rates for the online classes for SJSU students were 29%, 44%, and 51% and the corresponding passing rates for the face-to-face versions were 80%, 74% and 74% respectively.

3. Kids Play Math program experience, design cycles and flexibility

The Kids Play Math educational software has been undergoing continuous cycles of design, feedback, improvement and redesign for six years. We have been led by the experiences and helpful feedback from our participating teachers. Instead of creating a single program for purchase and large-scale implementation, we have moved step-by-step, to make the software fully meet the needs of teachers and children in Head Start.

We have designed and re-designed the educational software to become a highly sophisticated support system for learning mathematics. It is far more than simply “computer games.” As one teacher says,

“ The children enjoyed playing the games and the best part was that they were able to interact with their classmates as well as the teacher when working on the computer. These are the computer games that I appreciate where there isn’t just the screen entertaining our children. With these games, children can work with their parents, other classmates and/or the teacher. ”

This sophisticated interaction results in deeper learning of mathematics for children:

“ Los juegos de matemáticas en la computadora son muy útiles para que los niños desarrollen su pensamiento lógico porque se requiere de toda la capacidad de ellos para observar, disfrutar de diferentes piezas de información, analizar la información, planificar y analizar las posibles soluciones, y elegir la acción apropiada. Con éstos juegos de matemáticas en todos los niveles los niños aprenden mucho y mas que nada, van avanzado en su aprendizaje mientras se divierten!

[The computer math games are very useful for children to develop their logical thought processes, because they require the full capacity to observe, understand various pieces of information, analyze them, plan and evaluate possible solutions, and choose appropriate action. With these games children at all levels learn a lot, and moreover, and learn while playing.] ”

In addition, the software is designed to help teachers:

“ The computer games are appropriate for children and help the children engage in the activities. [They] also help a teacher with ideas to implement in the classroom. ”

The online course has gone through similar cycles of design—this project utilized the third version of this course, which was highly successful due to our incorporation of feedback from previous versions.

“ I felt this course was very effective in requiring teachers to think about improving concept development and instructional support for math skills in their classrooms. ”

“ The online course was very easy to use and self-explanatory. ”

Finally, the entire program, having been funded originally through OHS, has been designed to be effective specifically in the context of Head Start, and has been implemented with Head Start teachers in urban, suburban and rural contexts around the US.

4. Involvement of both teachers and coordinators in an essential way.

The program is designed for teachers. It is not a trainer of trainers model. Teaching staff (teachers, assistants, home providers) must take the course themselves in order to get the benefit of the job-embedded learning design

Nevertheless, the program is designed to involve coordinators in an essential way—coordinators learn the material alongside teachers, so that they can support them to continue making changes after the course and training are completed. This supports the ongoing nature of the instructional changes and dramatically increases the program’s impact.

Teachers and coordinators interact throughout the project, as co-participants in the online course, EMILI training and the conference calls and through classroom observation.

7. Recommendations

Kids Play Math believes that this project represents the most successful and cost-effective model for deep implementation of the Kids Play Math program in a way that provides long-term improvement in early mathematics instructional support. We recommend:

1. That this model continue to be supported and scaled up, for eventual use by any Head Start program. We suggest that funding be provided for the participation of up to 20 programs in the spring of 2015, and up to 100 programs in the 2015–2016 year.

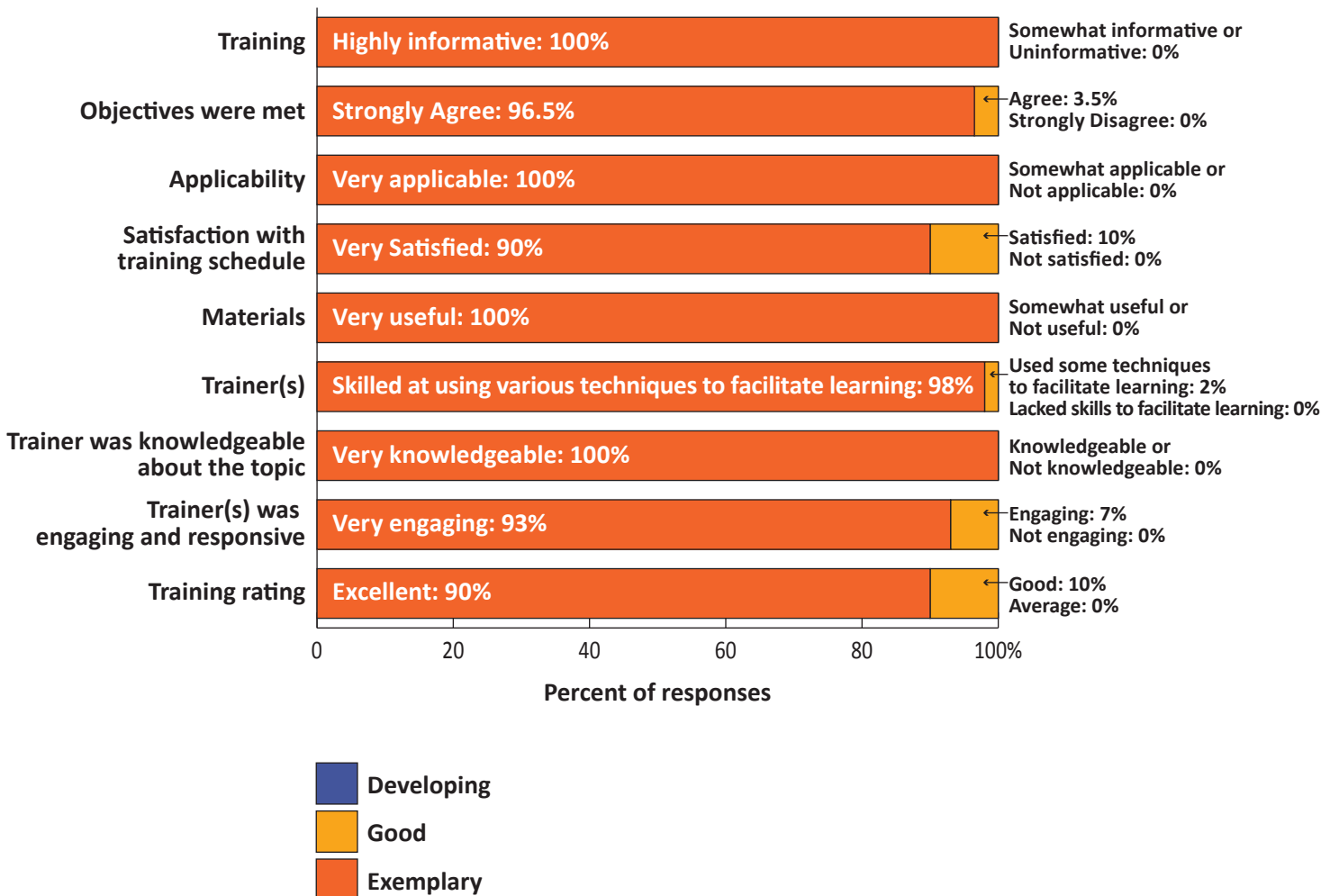
2. That Kids Play Math be supported to develop a course in Early Mathematics Support for ECE specialists, so that they can continue to provide ongoing support to programs, coordinators and teachers as they continue to use Kids Play Math.

Appendix I:

Complete Results of the EMILI Training Survey and the Online Course Survey

EMILI Training Survey Results

Number of respondents: 57 out of 76 trained



Online Course Survey Results

1. How much early math did you learn in this course?

- 75% A lot
- 21.4% A fair amount
- 0% A little
- 3.6% Almost not at all

2. I provide classroom activities for children in early math:

- 53.6% More than two times every day, in different areas of instruction
- 14.3% About once or twice each day
- 14.3% Several times a week
- 14.3% About once a week

6.* How long did it take you to complete this course, from when you started Lesson 1 up to now?

- 32.1% less than a month
- 46.4% about one month
- 21.4% about two months
- 0% more than two months

7. How did the process of installing Kids Play Math games go for you?

- 21.4% It was very easy to install the Kids Play Math games and I installed them myself.
- 67.9% I had some help from a person in my program to install the Kids Play Math games, but they were able to do it easily.
- 7.1% It was so difficult that my technology support person needed to contact Kids Play Math.

8. What was the process of registration like for you?

- 39.3% I was able to register myself
- 53.6% Someone from my program had to help me register, but they were able to do it themselves.
- 7.1% The technical support person from my program had to contact Kids Play Math in order to get me registered.

*Missing items—some questions were written to allow more than one response, but were entered into the survey software as allowing only a single response. Data for these questions is therefore not meaningful and these have been removed.

9. How easily were you able to navigate the course?

- 89.3% I was almost always able to do the topics in order and didn't have difficulties.
- 7.1% I sometimes forgot to do a quiz and had to go back.
- 3.6% I had some difficulty doing the topics in order and I forgot some quizzes and had to go back quite a few times.
- 0% It was so difficult to navigate the course that I needed to ask for help from someone in my program.

10. How helpful were the classroom activities?

- 100% They were very helpful and it was the right amount of work
- 0% They were helpful but it took too long.
- 0% They were not very helpful to me.

11. Were the lesson videos clear?

- 96.4% They were clear
- 3.6% They were somewhat clear
- 0% Some of them were not very clear.
- 0% The lesson videos were all unclear on my computer screen

12. Some of the quizzes in the course were more difficult. How did you do on them?

- 0% The most difficult quizzes were very hard for me and I had to take them several times.
- 100% The most difficult quizzes were somewhat challenging, but they helped me learn.
- 0% The most difficult quizzes were so easy that I didn't learn much from them.

13. I didn't change my instruction very much because of this course because I was already doing these kinds of activities on a regular basis.

- 39.3% true
- 60.7% false

14. The children in the classroom are playing the Kids Play Math computer games individually for at least 10 minutes per week.

- 92.9% true
- 7.1% false

15. I am continuing to play Kids Play Math computer games in a small group of children using the "Play as teacher" mode and asking extension questions at least 3 times each week.

- 92.9% true
- 3.6% false

16. How many times did you watch the videos?

- 35.7% Almost always just one time.
- 42.9% I watched several of the videos two or more times.
- 21.4% I watched most of the videos 2 or more times.
- 0% I often watched videos 3 or more times.

17. I am providing opportunities for children to first work with small numbers before moving to higher numbers, and when children have difficulty, I am moving back to smaller numbers before going on.

- 100% true
- 0% false

Appendix II: Teacher-created activities



The activity, as explained by the migrant Head Start program teacher that developed it:

Story fue la representación de “Cinco fantasmas” en la cual hice cinco fantasmas de papel con diferentes expresiones en la cara. La rima fue la siguiente:

CINCO FANTASMAS

Cinco fantasmas divertidos jugando en mi cuarto, uno se quedo dormido y quedaron...cuatro.

Cuatro fantasmas traviosos fueron con Andrés, uno se perdió en el camino y quedaron...tres.

Tres fantasmas hambrientos comieron arroz, uno se enfermo de su estomago y quedaron...dos.

Dos fantasmas silenciosos disfrutando su desayuno, uno se fue pronto y solo quedo...uno.

Un fantasma asustado se escondió en un agujero, ya no pudo salir y quedaron...cero.

Mientras leía la rima, íbamos contando para que los niños pudieran contestar las preguntas. Por ejemplo, “Si yo tenía 5 fantasmas y uno se quedo dormido, cuantos nos quedan?” y así continuamos hasta llegar al cero. Después lo hicimos a la inversa, o sea agregando fantasmas, para dar la oportunidad de que todos ellos participaran. Algunos niños para responder tenían que contar desde uno para saber cuantos eran, otros lo sabían con tan solo mirar. Lo que si les quedo claro es que el numero “5” representa la cantidad de sus dedos que tienen en una de sus manos. Esta actividad mantuvo enfocados a los niños porque fue diferentes para ellos. Yo no había usado las rimas para representarlas en forma teatral. Esto, en mi opinion, es una idea genial!



TEACHER-CREATED ACTIVITY **2** Una Carrera Grande

The activity, as explained by the migrant Head Start program teacher that developed it:

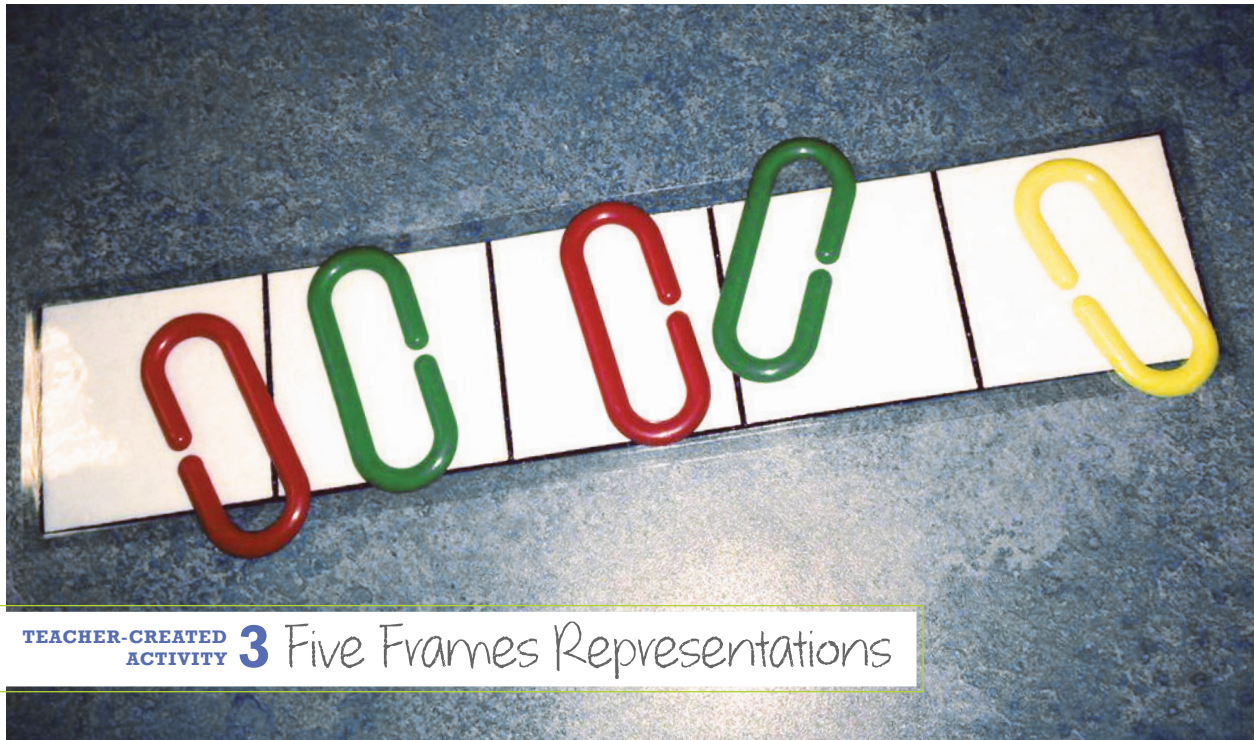
La actividad de “Una carrera grande” la hice de dos maneras. Una jugando con ellos en la mesa y la otra en el piso. Para hacer la actividad en el piso, forre con papel blanco una pequeña caja para utilizarla como dado. Para jugar forme dos equipos. El equipo “Azul” y el equipo “Rojo.” Un niño avanzaba los puntos en las casillas de los números como puntos mostraba el dado, mientras su compañero lanzaba el dado. Durante el juego les hice las siguientes preguntas: “Cuántos casillas ha avanzado su equipo? Cuántas casillas menos tiene el equipo Rojo que el Azul? En cual numero esta parado el equipo Azul? Como lo saben? Cuántos puntos necesitan para llegar al final? Dos o uno? Cual equipo va ganando? Por que? Por que el equipo

Rojo tardo mas en llegar a la meta? Si el equipo Azul alcanzo el numero diez, cuantas casillas menos tiene el equipo Rojo?

Aquí pude observar tres cosas: una, todos querían participar para ganar; dos, todos estaban completamente enfocados y apoyando a su equipo; tres, buscaban el lado en donde el dado tenía *dos puntos* y lo lanzaban al suelo tratando de que cayera por ese lado para avanzar mas rápido y ganarle al otro equipo.

“ En mi opinion, este tipo de juegos usando los dados estimula el interés de los niños sin darse cuenta que están contando y ademas están sumando y restando! ”

—Laura de Avila



The activity, as explained by the migrant Head Start program teacher that developed it:

Children actively engaged in this activity. We used the 5 frames in 11 centers in our classroom. These frames represented how many children belong in each center. Because of prior representation on how many children belong in centers the children was able to transition in the 5 frames. Teacher used 5 frame representations along with pins to help children interact with math activity. The block center was represented with the 5 frame. In the block center there should only be 4 children. Therefore, there were four dots in the five frame representation. The teacher spotted 5 children in the center and only three pins on the five frames. The teacher asks the children, “How many children are allowed in the block center at one time?” The children

responded by saying “four.” The teacher asked, “How do you know?” Then child got up and pointed to the 5 framed representations that was place in the block area and said “see.” The teacher asked, “what do you see?” the child begin to point and said “1, 2, 3, 4—4 children.” The teacher asked “can you tell me how many children are in the center.” The child pointed to each child and said “1, 2, 3, 4, 5—5 children are here.” The teacher said “if four children are allowed in the center and five are here what we do?” The child responded and said “1 child bye.” This representation allowed the child to be actively involved also the child was learning math while playing. The extra child end up going to another center and the child that was missing a pin placed his pin on the fourth dot. This went smooth. Children appeared to be happy and throughout the day used the 5 frame representation at centers.

Appendix III:

Letter to Directors and Original Early Math Initiative Proposal

June 23, 2014

Dear Director,

As part of the Region XII Office ongoing efforts to address School Readiness, we are excited to share with you, the Region XII Office will be sponsoring an Early Math Initiative (EMI) starting August 2014.

What is the Early Math Initiative (EMI)?

The EMI is a collaboration between the Region XII T/TA project, the University of Denver and Jenny Lerner, Region 12 Early Math Consultant to offer 10 grantees an opportunity to participate in a 4 week Kids Play Math online course including a two day in person on site visit with the trainers and coaching via phone conference between August, 2014 and November 7, 2014*.

*Some possible times are:

August 6- September 3

September 3- October 1

October 1- October 29

Please Note: The courses must be taken while teachers are working directly with children in the classroom.

Why participate in the EMI?

By participating in the 4 week Kids Plan Math online course and two day on site visit, classroom Teachers will have an opportunity to “Put Theory into Practice” (Job-Embedded Professional Development Model). Teachers will be actively involved in their own professional development and they will be able to immediately implement what they learned in the classroom. In the Job-Embedded Professional Development Model, teachers will have a chance to learn, try the new concepts that they have learned in their own classrooms, and evaluate their performance. In other words, the teachers will learn-try-evaluate which makes the Job-Embedded Professional Development Model so effective

Why a focus on Early Math in MSHS?

Based on research, early math is a high predictor of “later academic achievement in multiple subjects” (as outlined in “The Head Start Child Development and Early Learning Framework”), therefore, it is essential for Migrant and Seasonal Head Start (MSHS) grantee teachers to receive support in understanding how to provide important math concepts and key math vocabulary experiences in their everyday classroom practice with children. In addition, TTA Early Childhood Education (ECE) Specialists and School Readiness calls data, have indicated that grantees report challenges in developmental growth of early Math for children birth to 5 years in their on-going assessment data.

How can you support the Region 12 EMI? By Following the two steps as described below:

First Step- Register with the University of Denver (see attached Frequently Asked Questions) Grantees will be responsible for paying \$195.00 registration fee per teacher to participate in the 4 week online course. Teachers will earn 3 CEUs from the University of Denver with the option of earning one credit from Adams State College for their enrollment in this class. Allow teachers time to participate in the 4 week online course with support from the Education Coordinator and/or designee.

Second Step- Schedule a two day visit with consultant(s). The Region 12 T/TA Project will incur all expenses related to the consultant visit and coaching via phone.

Want to learn more about the Region 12 EMI?

Please see the attached Region 12 EMI documents with more detailed information. In addition, please join us on Wednesday, July 2, 2014 at 3:00pm EDT for a phone conference with Jenny Lerner by calling 1-866-668-0721 passcode 985513779.

In the meantime, if you have any immediate questions, please feel free to contact Angela Branch, Region 12 T/TA Manager at abbranch@fhi360.org.

Job-embedded Implementation Support for Early Math in Migrant and Seasonal Head Start (MSHS) Programs

Objective: *Improve concept development and quality of feedback in early math in MSHS programs.*

Summary: *A professional development opportunity for teachers to participate in a combination of online, in person, and phone consultation to support their knowledge in the area of early math.*

Rationale and Background

Kids Play Math offers professional development in early mathematics teaching for preschool teaching staff that combines online and face-to-face elements, utilizing each format to best take advantage, to create a job-embedded learning experience that will enhance the early mathematics teaching skills of MSHS teaching staff, particularly in areas such as concept development, providing effective feedback to children and modeling the use of mathematical language.

The advantages of online instructions are:

1. The ability of participants to view materials numerous times, at any time of the day.
2. The opportunity to implement learning directly and immediately in classroom practice.
3. The ability of participants to control the pace of the course.
4. The opportunity for self-assessment and course assessments, which can be designed for mastery.

The advantages of in-person professional development are:

1. Easier to ask and answer questions in person.
2. It's possible to have in-depth discussions that simply don't work as well on line.
3. There is an opportunity for demonstration teaching.
4. There is an opportunity for observing teachers' classes and providing feedback.

The combination of online, in person and phone consultation professional development utilizes the best of each format to create a superior professional development opportunity for MSHS teaching staff.

Online and Technology Elements

“Improving Concept Development using Early Mathematics,” provided by the Kids Play Math project (originally funded by a Head Start Innovation and Improvement Grant, is an improved version of a currently successful online course in early mathematics).

The online course includes educational classroom activities and adaptive bilingual (English and Spanish) learning software for instruction and assessment. The online courses provide preschool teachers with the tools they need to support children's concept development and quality of feedback. The courses include hands-on activities that are directly implemented in teachers' classrooms, providing a job-embedded professional learning experience. Concrete examples, intended for immediate implementation and necessary background are provided in the course. (See attached detailed description of the course)

This course was created as an extension of the Kids Play Math Project. This project was developed by a HHS/ACF Head Start Innovation and Improvement grant to the University of Denver. It is currently supported by the University of Denver and extended to the Toyota Foundation to include kindergarten and first grade classrooms through funding from the Toyota USA Foundation.

The course incorporates insights gained from 4 years of field-testing in Head Start programs, which has included Head Start programs in urban, suburban and rural areas. Both teachers and coordinators have found the current course to be extremely useful in improving early mathematics instruction, particularly in the areas of concept development and quality of feedback.

Each of the 4 lessons of the online Kids Play Math training course has a 5-minute video that explains an important math concept. In addition, there are three or four short videos with classroom activities that teach math content and support concept development, high-quality feedback, and language modeling. The teachers try the activities in the class, write their experiences in the course's online forum, were feedback is collected, and take a quiz to make sure they understood the concept. A lesson is designed to be completed in one week, and the course in 5 weeks. (See attached detailed description of the course).

Offline (In Person and Phone Consultation) Elements

Kids Play Math consultants have many years of in person professional development experience. This component is designed to provide the aspects of professional development that work best in these formats—questions and answers, group discussions, observations, mentoring and demonstration. They are skilled facilitators of group discussions, experienced in classroom observation and knowledgeable in both mathematics and teaching. The specific presentations and facilitation design have been developed over the entire 5-year period of the project. The practical examples support improved instruction in all areas of the Head Start context: child-initiated activities, large and small groups, transitions and work with families. The content of our course, face-to-face work and other support is designed to work with any curriculum that is well-aligned with the Head Start Child Development Early Learning Framework (CDEL).

Together, these elements provide a high-quality professional learning experience that is research-based, job-embedded, practical and effective. The content is based on the Office of Head Start Child Development and Early Learning Framework (OHS CDEL) and research in early mathematics learning, incorporating what is known about the development of mathematical concepts in children. The consultants practical examples of high-quality feedback and appropriate modeling of mathematical vocabulary, in the context of numerous classroom activities designed for immediate implementation by teaching staff. Elements of observation, evaluation and assessment are included. The outcomes are improved teaching skills in important areas of teacher evaluation, leading to improved student learning and school readiness.

Expected Outcomes

- ❖ 85% of all participants will complete the course
- ❖ Ongoing improvements in early math instruction as assessed at the program level.
- ❖ Improvements in math instruction as measured by the KPM Consultants Early Math classroom observation form, which is part of the course.

Kids Play Math

Kids Play Math provides online professional development for teachers, including educational classroom activities and adaptive learning software for instruction and assessment. Our online courses provide preschool teachers with the tools they need to support children’s concept development. The courses include hands-on activities that are directly implemented in teachers’ classrooms, providing a job-embedded professional learning experience.

Kids Play Math was created by an Innovation and Improvement Project through the Office of Head Start. Our philosophy starts and ends with providing a rich, hands-on, interactive learning environment for both teachers and their students. Teachers take online courses that include video examples of in-depth discussions with children, concrete activities to implement directly in classrooms, and information about children’s learning, all supporting concept development. This course also provides an orientation to sophisticated educational software designed to improve instruction, individualization and assessment.

Kids Play Math focuses on a subject that is often neglected in early years but is vital to children’s later academic success, even later literacy. Teachers learn how to use concrete everyday objects and activities to generate in-depth discussions supporting conceptual learning. By acquiring skills in language modeling, high-level questioning, working with concrete objects and group discussions, teachers learn valuable techniques that are applicable to many different subjects and all aspects of instruction.

Kids Play Math courses are taken concurrently by the teachers and coordinators in a program, supporting immediate implementation and collegial support. We focus on a few key practical ideas, creating real instructional improvement. CEU credit from the University of Denver is included. 1 semester-hour of college credit available from Adams State University (ASU) for \$55 per participant, paid directly to ASU.

Detailed Description of the Kids Play Math course: Improving Concept Development using Early Mathematics

Before the course starts

Registration in the course is easy. Head Start teaching staff who will take the course go to our website (www.kidsplaymath.org/moodle26) and click on “login” at the top right corner. Since this is their first time in the website, they create a new account. This includes username, password, email, name, and city. Once this is done, we accept them into the course, and the next time they go to the website, they login using their username and password and they go to the course.

Most people register quickly but some people take more time. We like to start registration two week before the course starts to make sure everyone is in the class. We also use this time to communicate with the technology support person to install the computer games in the classrooms.

The Course

The course has four lessons:

1. Learning Trajectory of Counting
2. Representation of Numbers
3. Addition and Subtractions
4. Geometry and Spatial Sense

All lessons have a similar format, and each can be completed in one week. The content is delivered in roughly 30 minutes of video. The first video explains a concept in Early Mathematics. Then there are short videos that describe effective and research based classroom activities. These videos emphasize Concept Development, Quality of Feedback, and Language Modeling. The teachers go to their classroom, do the activities, and write their experiences in the course Forums. The questions are simple, for example, a Lesson 1 forum asks “How did things go when you played the Hula Hoop game and did the extension activity with your children? What did you see them learning?” Each lesson has a video that supports English Language Learners, and a video that relates the concept of the lesson with the computer games. At the end of the lesson the teachers take the quiz (they can take the quiz many times), they pass it, and they go to the next lesson.

To give an idea of length of the course, we show the content of Lesson 1 below with the length of the videos (The other lessons are similar).

Lesson 1:

1. A video explaining the learning trajectory of counting (length 3:43).
2. Classroom activities.
 - a. Observation Assignment (length 3:16)
 - b. Hula Hoop Game (length 5:19)
 - c. Counting in the Centers (length 6:57)
 - d. (Optional) Math and Literacy (length 3:28)
3. Dual Language Support (length 3:13)
4. Counting in the Kids Play Math Computer games (length 4:06)
5. Quiz Lesson one (seven questions, and the quiz can be taken many times)
6. Forums (one question for each Classroom Activity)

Requirements for MSHS Grantees to participate in the Region 12 EMI:

1. Course registration fee \$195 per participant to the University of Denver. For every 12 teaching participants one coordinator is free.
2. MSHS programs pay for at least 8 total participants—at least 7 of which must be teaching.
3. Cohort includes a coordinator and/or mentor who directly works with each participating teacher.
4. Mentors and Coordinators should participate in the conference calls mentioned above
5. Each participating teacher must communicate with a mentor/coordinator once per lesson (i.e., once per week) with one of the participating coordinators/mentors in their program.
6. Participating teaching staff must be currently teaching in a preschool classroom.
7. Programs agree to provide the University of Denver with the following:
 - a. Pre and post results on our early math observation instrument
 - b. A brief report on how math instruction has changed/improved for participating teachers.
 - c. Pre and post scores on the CLASS areas of concept development and quality of feedback.

Jenny Lerner will offer the following to support the Region 12 EMI:

- Trainers
- One two-day in person training and mentoring visit
- Two conference calls and supporting materials for 10 programs
- Materials

Region 12 T/TA will offer the following to support the Region 12 EMI:

- Funding for Jenny Lerner’s on site visits, travel, and time associated with phone conferences
- Follow up T/TA with Early Childhood Education (ECE) Specialists

The University of Denver will offer the following to support the Region 12 EMI:

- 4 week online course for 8–30 participants
- Bilingual Kids Play Math educational software designed specifically for the Head Start context, for children in participants’ classes and their families.
- Each participant (teaching staff and coordinators/mentors) will receive three through the University of Denver

Optional College Credit

Teachers and/or Coordinators/Mentors can receive 1 College credit through Adams State University (ASU). The grantee is responsible for paying \$55 directly to ASU if college credit is desired, in addition of the \$195 registration fee.