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Collaborative for Evaluation
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**Storytime STEM-
packs™ for Early
Learners in Diverse
Settings 2018:
Evaluation Report**

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Introduction

The Allegheny Intermediate Unit's Math & Science Collaborative (AIU MSC) of Western PA provides services for 138 public school districts and non-public schools, and is a comprehensive and award-winning organization for advancement of K-12 STEM learning. AIU MSC developed Storytime STEM-packs through an NSF I-CORPS™ grant (Award #1546720). AIU MSC has developed a complex model of professional development for teachers, administrators, and institutions of education, which has been customized specifically for this project. Librarians, library administrators, and early childhood educators participated in the 2018 Storytime STEM-packs for Early Learners in Diverse Settings program. Participants in this year's project were the Westmoreland Library Network (WLN), Allegheny County Head Start (HS) and PreK Counts, Allegheny Valley School District, Carlynton School District, and Steel Valley School District .

Survey Design

The Collaborative for Evaluation and Assessment Capacity (CEAC), housed within the University of Pittsburgh's School of Education, has served as the evaluation team for the Storytime STEM-packs program since its inception. Two surveys were developed and used to rate the effectiveness of the Storytime STEM-packs orientation professional development sessions and to collect data on participants' implementation of the Storytime STEM-packs in the libraries and classrooms. The orientation surveys utilized a retrospective pre-post design to examine change in participants' confidence of the STEM-packs STEM content and their comfort level with facilitating STEM activities. The surveys also included a section on participants' perception of the user-friendliness of the STEM-packs. The implementation survey utilized a post only design to collect data on which and how many Storytime STEM-packs participants used, their specific applications in the libraries and classrooms, and their user-friendliness. The surveys utilized a 5-point scale for multiple choice questions (1-low to 5-high), and included open-ended items to drill down on participants individual experiences and perceptions.

Key Findings

- Of all PD participants, 90.9% (n=40) found the professional development valuable (4) or very valuable (5).
- For all three questions regarding confidence pre- and post-professional development, the number of respondents who selected confident or very confident increased by at least 40%:
 - 27.3% (n=12) to 81.8% (n=36) - With the content of sound
 - 25.0% (n=11) to 86.4% (n=38) - With how children best learn about sound
 - 40.9% (n=18) 81.8% (n=36) – With facilitating STEM activities in general with children at their site
- The most implemented Storytime STEM-packs™ were: *Drum City* (63.3%, n=19) and *Giraffes Can't Dance* (60.0%, n=18)
- The vast majority of the respondents (93.3%, n=28) agreed or strongly agreed that STEM-packs were user-friendly and engaging to children.
- When asked if they would plan to use the Storytime STEM-packs™ in the future 96.7% (n=29) replied yes. 76.7% (n=24) stated they were interested in participating in the program again next year, and 93.3% (n=28) said they would recommend the Storytime STEM-packs to colleagues.

Storytime STEM-packs™ Professional Development Orientation Survey

Respondents’ Roles in Their Organization

Respondents were asked to describe their role in their organization, of the 44 respondents who answered this item, 31.8% (n=14) were involved with the library system, and 27.3% (n=12) were a part of the Head Start organization. There was an additional 25.0% (n=11) respondents who were a part of PreK Counts. 9.1% (n=4) of respondents were public school teachers and the remaining 20.5% (n=3) selected other. For the respondents who selected other one was a volunteer, one was a Program Coordinator, and one was an early learning consultant.

Of these respondents, 52.3% (n=23) had no prior experience with Storytime STEM-packs and related professional development. 31.8% (n=14) have been involved with Storytime STEM-packs for one year and 15.9% (n=7) have been involved for two years. In regard to experience implementing Storytime STEM-packs, 56.8% (n=25) had no prior experience, and 29.5% (n=13) implemented them last year. 9.1% (n=4) of respondents have implemented Storytime STEM-packs for two or more years.

How comfortable were you as an adult with the content of sound?

Of the 44 respondents, prior to the workshop, 27.3% (n=12) had a cumulative frequency percentage (CFP) of confident or very confident in their knowledge of sound as an adult. Prior to PD, the highest percentage (34.1%, n=15) of respondents felt somewhat confident in their knowledge of sound. After the professional development, there was a CFP of 81.8% (n=36), and 18.2% (n=8) felt uncertain about their comfort with the content of sound as an adult.

Table 1. Respondent comfort with the content of sound before and after professional development

	Not at all confident % (n)	Somewhat confident % (n)	Uncertain % (n)	Confident % (n)	Very confident % (n)	CFP 4-5 (n)
<i>Before PD</i>	11.4% (5)	34.1% (15)	27.3% (12)	15.9% (7)	11.4% (5)	27.3% (12)
<i>After PD</i>	0.0% (0)	0.0% (0)	18.2% (8)	45.5% (20)	36.4% (16)	81.8% (36)

How comfortable were you with how children best learn best about sound?

Prior to the workshop, of the 44 participants, 25.0% (n=11) were either confident or very confident in their knowledge of how children learn best about sound. The largest percentage (36.4%, n=16) of respondents answered somewhat confident in their knowledge of how children learn about sound. After the professional development, respondents had a CFP of 86.4% (n=38) confident or very confident in their comfort level of how children learn best about sound. The remaining 13.6% (n=6) were uncertain in their comfort level.

Table 2. Comfort with the how children lean best about sound before and after professional development

	Not at all confident % (n)	Somewhat confident % (n)	Uncertain % (n)	Confident % (n)	Very confident % (n)	CFP 4-5 (n)
<i>Before PD</i>	13.6% (6)	36.4% (16)	25.0% (11)	13.6% (6)	11.4% (5)	25.0% (11)
<i>After PD</i>	0.0% (0)	0.0% (0)	13.6% (6)	47.7% (21)	38.6% (17)	86.4% (38)

How comfortable were you with facilitating STEM activities with children at your site in general?

Of the 44 participants that ranked their comfort level prior to the workshop, there was a CFP of 40.9% (n=18) for respondents who felt confident or very confident in their comfort level of facilitating STEM activities with children in general. The highest percentage of respondents (38.6%, n=17) felt uncertain about their comfort level in facilitating STEM activities with children in general. After the professional development, the respondents had a CFP of 81.8% (n=36). The remaining participants were uncertain (18.2%, n=8) in their comfort level for facilitating STEM activities with children in general.

Table 3. Comfort with facilitating STEM activities before and after professional development

	Not at all confident % (n)	Somewhat confident % (n)	Uncertain % (n)	Confident % (n)	Very confident % (n)	CFP 4-5 (n)
<i>Before PD</i>	6.8% (3)	13.6% (6)	38.6% (17)	18.2% (8)	22.7% (10)	40.9% (18)
<i>After PD</i>	0.0% (0)	0.0% (0)	18.2% (8)	38.6% (17)	47.7% (21)	81.8% (36)

How valuable was this Storytime STEM-packs Professional Development to you as a teacher/librarian?

Of the 44 respondents, 50.0% (n=22) rated the professional development to be very valuable and 40.9% (n=18) considered PD to be valuable. 6.8% (n=3) were uncertain about professional development's value and one respondent (2.3%) rated it not valuable. When asked, suggestions to help improve and change the professional development for the future, most participants did not have any suggestions on how to change the professional development. One respondent said, "very interesting, involved activities and discussions." A few respondents noted that they enjoyed condensing the PD down to one day. A few respondents felt as though it was unnecessary to do the activities that were designed for children and have the parade, but others enjoyed the interactive hands on aspect of the program and wished there were more hands on activities. Three respondents noted that it would be nice for participants to have access to kits they do not have already. Another two respondents wished for more simplified and clear instructions.

How can Storytime STEM-packs support effective STEM instruction in your program?

All respondents had positive feelings about how STEM-packs supports effective STEM instruction except for one librarian who does not think STEM activities should be integrated into the library. Respondents found one of the most effective aspects being the hands-on nature of the STEM-packs. Additionally, respondents found that the packs providing all the necessary materials really facilitates the implementation of the STEM-packs. A few respondents also appreciate how children and parents can work together on the completion of the STEM-packs.

Additional feedback and suggestions from respondents

Most respondents provided positive feedback regarding their experience of the PD. The most prevalent suggestion was to expand access to STEM-packs and more ideas regarding implementation. Negative feedback centered on activities that some respondents did not find engaging, such as the parade activity and lecture style presentations.

PPG Storytime STEM-packs Implementation Survey.

Respondent Characteristics

Thirty participants responded to the survey, of those 43.3% (n=13) of the respondents worked in the in the library system. 40.0% (n=12) of respondents selected working for Head Start, and 16.7% (n=5) of respondents worked for PreK counts.

Analysis Overview and Findings

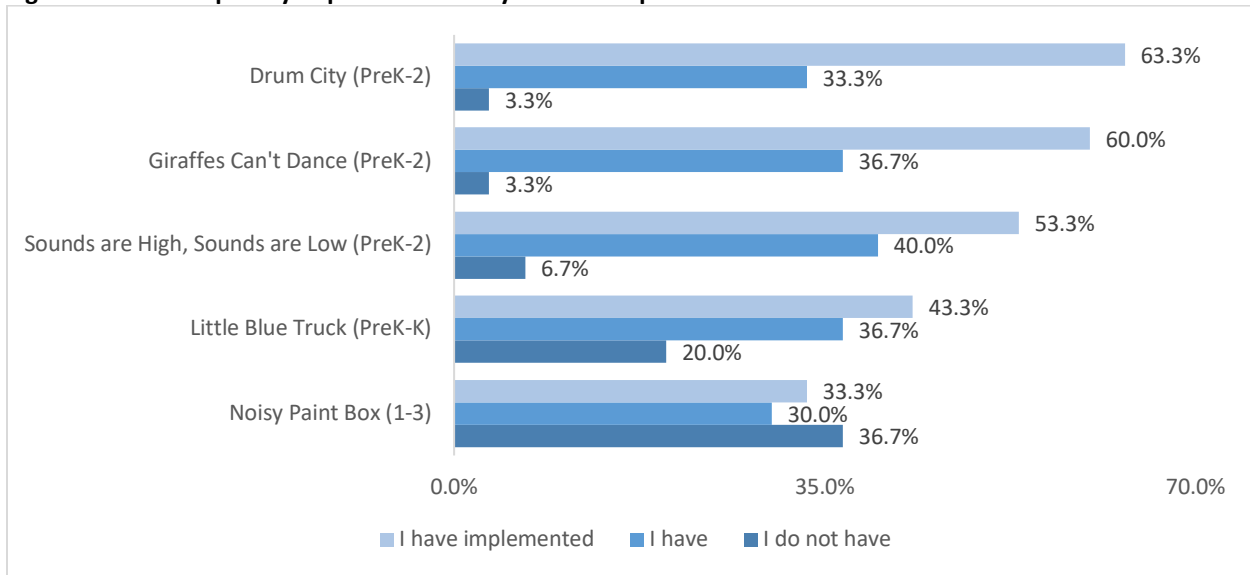
In analyzing the data, basic descriptive statistics were used for scaled questions. Qualitative analysis strategies were conducted on the open-ended questions of the survey. Many of the open-ended questions elicited a wide range of answers, as is evidenced in the statistics and findings below. The questions were designed to determine degree of implementation and use of STEM-packs™ and elicit feedback from the participants and the families they serve. It was split evenly between respondents whose first year it was implementing STEM-packs and those who have implemented them before (50.0%, n=15).

STEM-packs Implemented Question

Numeric Question 1 asked: *Which of the following Storytime STEM-packs™ have you implemented in your classroom/library/program? (Select all that apply).*

For the thirty implementation survey respondents, the most frequently (63.3%, n=19) implemented STEM pack was Drum City. Only one respondent did not have the Drum City STEM-pack, and 33.3% (n=10) of respondents had the Storytime STEM-pack but did not implement it. The least frequently implemented was Noisy Paint Box, which was implemented by 33.3% (n=10) of respondents. 36.7% (n=11) of respondents did not have the Noisy Paint Box STEM-pack and 30.0% (n=9) of respondents had the STEM-pack but did not implement it. For full implementation data please refer to Figure 1.

Figure 1. Most Frequently Implemented Storytime STEM-packs



Question 2. (Please rate the overall user-friendliness of the Storytime STEM-packs you implemented)
 The next section asked the thirty respondents to rate the specific implementation experiences of the Storytime STEM-packs™ on a 5-point scale from strongly disagree to strongly agree. There were four measures: fun and engaging for kids; minimal preparation time; easy to use; and appreciation that STEM-packs are aligned Standards. All the statements received a CFP, of agree and strongly agree, greater than 80%. The highest CFP (93.3%, n=28) were for the statements *Storytime STEM-packs are fun and engaging for kids* and *Storytime STEM-packs are easy to use*. The lowest CFP was 83.3% (n=25) for the statement *using Storytime STEM-packs requires minimal preparation time*.

Table 3. Comfort with facilitating STEM activities before and after professional development

	I strongly disagree % (n)	I disagree % (n)	I neither agree nor disagree % (n)	I agree % (n)	I strongly agree % (n)	CFP 4-5 (n)
<i>Storytime STEM-packs are fun and engaging for kids</i>	0.0% (0)	0.0% (0)	6.7% (2)	53.3% (16)	40.0% (12)	93.3% (28)
<i>Using Storytime STEM-packs requires minimal preparation time</i>	3.3% (1)	0.0% (0)	13.3% (4)	43.3% (13)	40.0% (12)	83.3% (25)
<i>Storytime STEM-packs are easy to use</i>	0.0% (0)	3.3% (1)	3.3% (1)	36.7% (11)	56.7% (17)	93.3% (28)
<i>I appreciate that Storytime STEM-packs are aligned to Standards</i>	0.0% (0)	0.0% (0)	10.0% (3)	36.7% (11)	53.3% (16)	90.0% (27)

Scaled Question 4 asked: *Do you plan to any of your Storytime STEM-packs™ again in the future?* For the thirty implementation survey respondents, 96.7% (n=29) said yes and 3.3% (n=1) said no. Similarly, when asked *would you recommend Storytime STEM-packs™ to your colleagues and/or other organizations?* 93.3% (n=28) responded yes and 6.7% (n=2) responded no. The final Scaled Question

asked participants *Are you interested in receiving more Storytime STEM-packs™?* 76.7% (n=24) said yes and 23.3% (n=7) said maybe, and no one said no. Regarding professional development, 90.0% (n=27) of respondents were interested in participating in PD. Of those 27, 37.0% (n=10) would prefer on-line PD and 33.3% (n=9) would prefer face-to-face PD; the remaining 29.6% (n=8) did not specify which form of PD they would prefer.

An additional questionnaire regarding implementation was distributed asking librarians and teachers to note whether they own each STEM-pack, when/if they implemented the pack, and how many children attended the implementation. There were 23 teachers and librarians who responded, and all of them had the Drum City STEM-pack. 95.8% (n=22) of respondents had Giraffes Can't Dance, 91.3% (n=21) of respondents had Sounds are High, Sound are Low, and the fewest (56.5%, n=13) respondents had The Noisy Paint Box.

Twenty-two of the responding sites implemented at least one STEM-packs. Some sites implemented the same STEM-pack more than once, so 10 (45.5%) sites implemented Little Blue Drum at least once, but overall it was implemented 18 times. On average there were 14.7 children who attended the implementation of Little Blue Drum. The Drum City STEM-pack was implemented by 17 sites at least once, and overall was implemented 29 times. On average there were 15.3 children who attended the implementation of Drum City. Sounds are Low, Sounds are High was implemented by 14 sites at least once, and overall was implemented 21 times. On average there were 15.3 children who attended the implementation of Sounds are Low, Sounds are High. Giraffes Can't Dance was implemented by 15 sites at least once, and overall was implemented 25 times. On average there were 18.1 children who attended the implementation of Giraffes Can't Dance. Finally, The Noisy Paint Box was implemented by nine sites at least once, and overall was implemented 12 times. On average there were 14.5 children who attended the implementation of The Noisy Paint Box.

Open-Ended Questions

Do you have any other feedback/comments for us on the Storytime STEM-packs™?

Of the thirty respondents 40.0% (n=12) stated they had no feedback or comments at this time. Eight more respondents had only positive comments about the STEM-packs. Some of the large themes that were emphasized in these positive responses is the quality and ease of the STEM-packs. For those who had comments on how to improve the STEM-packs an overarching theme was the length of the training, they found the training to be long and could probably be shortened to half a day. Additionally, some respondents found that it was hard to maintain the attention of the children due the activities being relatively short.

For full results of both open-ended questions please refer to appendix.

For questions regarding Storytime

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