**Submission Abstract**

Pixel Arts (PA) is a non-profit association that promotes transformative change through community organizing and the imaginative potential of video games. PA creates maker-based learning environments that support the building blocks of creative innovation and connected learning. The association provides communities with opportunities to engage in STEAM-inspired activities (STEAM: science-technology-engineering-arts-mathematics). Through such activities PA desires to enhance youths' knowledge and skills with STEAM concepts and to enhance youths' non-cognitive learning skills. By creating safe, intergenerational, community based learning centers, PA expects that youths will become better equipped to learn across the board.

In July 2013, PA offered a prototype summer “game camp” for youth. Camp attendance was free and included meals. In a two-day intensive time-frame, youth were offered opportunities to participate in learning modules about game design, logic & coding, and art & animation. The camp assessment protocol included a pre-camp baseline assessment of youths’ non-cognitive learning profiles (quantitative assessments of youths’ self-determined learning, metacognition, self-efficacy). During camp, youth created digital portfolios documenting their skill growth and experiences. At camp close, youth were asked to complete the non-cognitive assessments again. Pre- and post-scores on the non-cognitive indices were compared with paired samples t-tests and the contents of the portfolios were qualitatively evaluated using grounded theory techniques.

Forty-two youth completed some or all of the assessment materials. Of the initial 42, 8 were described as having special needs (i.e., ASD, ADHD). Youth age averaged 13.56, with a range of 9 – 17 years. Twenty-five youth (2 with special needs) responded to the post-camp assessment request.

Examination of youths’ scores on the non-cognitive indices showed that youth entered camp with healthy motivational profiles and left camp with the same degree of motivational health (i.e., their averages scores started high and remained so). However, special-needs-youth entered camp feeling significantly less efficacious than their neuro-typical peers. Too few special-needs-youth completed the post-camp surveys to determine whether their sense of efficacy increased during camp.

Examination of youths’ portfolios further revealed that participating youth did indeed enhance their knowledge and skills with STEAM concepts. For example, all youth entered camp with specific interests in game design and left camp indicating that their personal learning goals had been met. Many youth remarked that they learned something entirely new, and that their passions for game design were enhanced. Eighty-percent of participating youth indicated a desire to continue working at home with skills learned at camp. Forty-one percent of youth shifted their attitudes towards group-work, from initial hesitancy to being comfortable with it.

From this evaluation process, PA themselves gained confidence in the efficacy of their camp design. Consideration of the entire process – from mentor training, to youth engagement, to work documentation (i.e., portfolio creation) – revealed many strengths and a few weakness to the initial prototype. PA is continuing to offer variations of this camp prototype in the community and is making design improvements as a result of this evaluation process. All signs suggest that PA is indeed effectively facilitating creative innovation and connected learning.

**Quantitative Assessments: Sources and Considerations**

**Self-Efficacy. The Student Confidence Survey:** Midgely et al., (2000).

* The Academic Self Efficacy subscale from the Patterns of Adaptive Learning Scales. The entire scale set entails survey assessments of school-aged children (4th grade – middle school) on a variety of achievement and motivation related constructs. The self-efficacy subscale is only 5 items, and is scaled on a 5-point Likert Scale. * Manual for Patterns of Adaptive Learning is available for download online:
  
  http://www.umich.edu/~pals/PALS%202000_V13Word97.pdf

**Metacognition. Meta Cognitive Awareness Inventory – Short form, revised** (MAI-SR). The MAI – SR is an unpublished revision (Craft, 2010, unpublished manuscript, scale use by permission of the author) of the MAI (Schraw & Dennison, 1994). The original 1994 scale is reliable and valid, but it is long (52 items). Craft reduced the scale to 16 items by selecting those items with the highest factor loadings. This shortened scale is designed for adults, thus I reduced the complexity of the reading to make it suitable for youth in middle and high school using the Flesch-Kincaid Reading Level index. I additionally had the revision verified by a middle school language arts teacher.


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**Achievement Motivation. Academic Self-Regulation Questionnaire** (SRQ-A, Ryan & Connell, 1989). The SRQ-A evaluates students’ motivation in two domains: autonomous and controlled. There are 32 items and respondents are asked to indicate the degree in which they believe each statement to be true of them by circling one of 4 options: Very true, Sort of true, Not very true, Not at all true.


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