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Promoting Social Change Through Game Education: Assessment of a STEAM-Inspired, Maker-Based Camp

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Description

Pixel Arts (PA), a non-profit association, promotes social change by creating maker-based learning environments to enhance underserved youths' exposure to STEAM-activities. An assessment of PA's prototype summer-camp revealed that the camp experience effectively enhanced youths' knowledge and skills with game design, logic/coding, and art/animation and nurtured youths' non-cognitive learning skills.
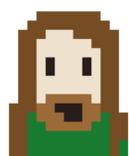
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Promoting Social Change Through Game Education: Assessment of a STEAM-inspired, Maker-Based Camp

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Pixel Arts
Play >Make >Design

Pixel Arts (http://www.gameeducationpdx.com/), a non-profit association headquartered in Portland, OR, promotes social change by creating inviting maker-based learning environments. The 2-day summer camp evaluated here marked the organization's first prototype camp. Camp activities, organized in modular format, offered youth the opportunity to work with expert mentors in learning about **(1) Video game design; (2) Art & Animation; (3) Programming**. By engaging with subject matter experts, youth acquired basic game design skills. PA aims to continue inspiring youths' confidence in learning and achievement by meeting youth where they are at and engaging them in a positive maker-, gaming-, and learning- culture.

ASSESSMENT METHOD

Change in youths' approach to learning from the start to end of camp was assessed via quantitative evaluation (i.e., survey instrumentation) and via qualitative evaluation (i.e., self reporting and work documentation in a camp portfolio).

Youth Demographics

- **Forty-two** youth completed some or all of the survey questions before camp start; 8 youth were flagged as having special needs (e.g., ASD, ADHD)

- **Youth age** averaged 13.56, with a range of 9 – 17-years; 2 youth were under 13 and 4 youth were over the age of 16.

- **Twenty-five** youth completed the surveys again after camp; 2 were among the special needs group.

Quantitative Instruments

1. **"Camper Confidence Survey:"** a five-item assessment of confidence/efficacy.
   "*I'm certain I can master the skills taught in game-camp.*"

2. **"Thinking and Learning Scale;"** a 16-item assessment evaluating metacognition for learning.
   "*I think about what I really need to learn before I start to study*."

3. **"Why I do Things:"** a 32-item assessment evaluating the quality of youths' motivation for learning. 4 subscales can be combined into:
   a. **Autonomous motivation** (Intrinsic + Identified):
   "*I do my homework because I want to understand the subject*."

   b. **Controlled motivation** (Introjected + External):
   "*I do my homework because I'll get in trouble if I don't*."

Qualitative Instrument: Camp Portfolios

Portfolio Design

Page 1 : Prompts for self-reflection:
- "*Describe yourself*"
- "*When I think about making video games, my ideas are inspired by* …"

Page 2: Prompts for goal setting, efficacy, and attitudes
- "*When I leave this camp, I most want to be able to* …"
- "*Right now, I am _____ confident in my computer skills*"

Pages 3 – 6: Documentation of work

Pages 7 – 8; Prompted reflection on what was learned
- "*At the start of camp I said I most wanted to be able to … and it turns out that* … "
- "*Of all the work I created at camp, I am most proud of* …"

Portfolio Implementation
Though portfolio construction and completion was discussed during a day-long intensive mentor training program and module mentors were provided with a handout to guide the portfolio introduction and completion process, fidelity in implementation across modules did not occur.

- Module mentors – *subject matter experts but not necessarily teachers* – remarked that the portfolio completion process required more attention & energy than they were able to give

OUTCOMES GOALS & SUPPORTING EVIDENCE

1. Creation of a multi-generational, productive, and fun learning environment where youth are comfortable seeking help and support in a variety of ways
- 41% of youth initially indicating some hesitancy in working with others improved in this regard during camp.

2. Creation of a learning environment that fosters positive achievement motivation and academic self confidence
- Youth left with the same, positive & healthy motivational profiles they arrived with, indicating that the tone of the camp fostered their learning.

3. Learning enabled through free choice (on the part of the learners) and expert instruction
- Met by design, with the modular organizational scheme
- All youth reported learning something new at camp. Some youth had particular learning goals that were indeed met, whereas other youth reported learning something completely new.

4. Learning in a safe environment, where mistakes are made but interpreted as teachable moments (*i.e. implementation of the mindset of "failing forward"*)
- Camp mentors were trained in advance to work with youth in a positive manner, and there was no indication that youth felt they couldn't make mistakes.
- Though some youth entered camp expressing nervousness about their ability to effectively engage, youth left camp reporting that there was no need for nervousness of any kind.
- With the exception noted that special needs youth entered camp with lower confidence than their neuro-typical peers

5. Creation of an environment where youths' love for games and gaming translates into opportunities for fostering STEAM educational initiatives
- 80% of participating youth indicated a desire to continue working on skills learned at camp.

6. Provision of a meaningful learning experience for youth who are likely (for socio-economic and/or regional reasons) to have limited opportunities for rich STEAM educational experiences.
- One parent remarked that the programing and design activities like those at this camp had recently been cut from their local high school thus they were delighted with the opportunity to engage in this camp
- Participating youth came from all over the greater Portland Metro region, spanning many different socio-economic areas
- 4 participating youth qualified for Title 1 support (i.e., free lunch).

ASSESSMENT CONCLUSIONS

1. **Improve portfolio usability**
   - Portfolio completion was not intuitive to youth. Provision of more options and fewer open-ended responses recommended.

2. **Improve Mentor Training re: camp goals** for fostering not just technical skills, but non-cognitive learning skills too

3. **Dedicate Portfolio Completion Support**

4. **Improve quantitative measures**
   - Scores on non-cognitive learning inventories showed a ceiling effect: youth arrived with healthy learning skill sets.
   - Further work in refining measurement (*and in understanding the expected profiles of participating youth*) needs to be done