TO: AOLME Project Leaders DATE: March 15, 2019

FROM: HRI AOLME Evaluation Team RE: Formative evaluation feedback on Level 1 Session 7

As part of HRI's formative evaluation in Year Two, we reviewed and provided feedback on Level 1 and Level 2 student materials. The project subsequently revised the Level 1 curriculum. In Year Three, we are providing a follow-up review of the Level 1 student materials. This memo provides formative evaluation feedback on Level 1 Session 7.

Our Year Three review focused on the curriculum's alignment with conceptual frameworks for effective instruction and equity, as well as its potential to be adopted by other users (e.g., teachers). The frameworks for effective instruction and equity are shown in Figures 1 and 2. Throughout the memo, we reference elements of the frameworks, typically in parentheses following a recommendation.

Framework for Evaluation: Elements of Effective Instruction

1. Motivation
2. Eliciting students' prior knowledge
3. Intellectual engagement with relevant examples, applications, and models
4. Use of logic and reasoning to make, defend, critique, and evaluate claims
5. Sense-making

(adapted from Banilower et al. 2010)

Figure 1

Frameworks for Evaluation: Equity

Four dimensions for addressing equity (Gutiérrez 2009)

1. Access: resources available to students for learning disciplinary content and practices
2. Identity: appropriate attention to students' personal identities and cultural backgrounds and to the "balance between self and others"
3. Achievement: results that students achieve
4. Power: social transformation including, at the classroom level, whose voices and ideas are acknowledged and acted upon

Equitable classroom practices (Moschkovich 2013)

1. Cultural context: ensuring that classroom activities are connected to students' local communities
2. Social organization: practices that facilitate students' participation in the classroom, including attention to similarities and differences between definitions of appropriate participation at school and in students' homes
3. Cognitive resources: enabling students to use their prior knowledge and experience, including language, as resources for learning

Figure 2

The structure of the feedback for each reviewed session is as follows: an overview outlines strengths of the session and general ideas for further enhancing the materials. We then give activity-specific suggestions for increasing the alignment between the materials and the

conceptual frameworks. Our intention was to make it easy to navigate between our suggestions and the materials, even though this arrangement led to repetition of some suggestions.

Session 7

Overview

Session 7 includes substantial opportunities for students to examine and modify pre-written code. In addition, the session includes sense-making prompts on some cards. You might consider increasing and deepening certain opportunities for sense making, and adding opportunities for eliciting students' prior knowledge and for students to use reasoning to make, defend, critique, and evaluate claims. You could potentially increase motivation by having facilitators share their final videos at the beginning of the session.

Session 7 also includes attention to access. For example, you provide a list of helpful commands and keyboard shortcuts (e.g., selecting a block of text, cut, copy, and paste) and you specify student roles on Card 7.5. You could further enhance student access by reducing potential points of confusion and adding in guidance for turn-taking and roles throughout the session. You could also attend more explicitly to identity, achievement, power, cultural context, social organization, and cognitive resources.

Suggested Revisions From Detailed Review

7.1 Create a Frame Row by Row

a. The card does not provide motivation for learning how to create a frame. (motivation)
   - Consider having students view final projects in 7.1 (currently an activity for 7.5) to provide motivation for creating frames.

b. The card does not elicit students' prior knowledg(prior knowledge)
   - Consider adding a discussion about what students know about creating images on the computer (or, if they have no experience, how they think they might do so) to the beginning of the activity

c. This card does not include a journal or discussion prompt after the final activity (sense making).
   - Consider adding a journal or discussion prompt at the conclusion of this activity to help students solidify their learnin

d. Students may be unfamiliar with the term "frame" and the phrase "specify the size" in computer programming. (access)
   - Consider adding a facilitator note with guidance for discussing how the meanings of these terms differ in computer programming and in everyday life

e. The card does not include explicit suggestions for students to take turns or enact particular roles within the group (access).
    - Consider adding suggestions to take turns on the cards or in the facilitator guidance.
    - Consider specifying student roles for the activity.

7.2 Make a Video Using Two Frames

a. Students may be unfamiliar with the phrase "specify your video" in computer programming. (access)
    - Consider adding facilitator guidance for discussing the meaning of this phrase in computer programming.
b. The intended take aways from discussing the structure of the code are not clear. (use of reasoning to make, defend, and critique claims, sense making)
    - Consider including sample questions facilitators can use to encourage students to defend and critique claims about the code.
    - Consider listing important takeaways in the facilitator guidance.
c. The card does not include explicit suggestions for students to take turns or enact particular roles within the group (access).
    - Consider adding suggestions to take turns on the cards or in the facilitator guidance.
    - Consider specifying student roles for the activity.
d. Note: The numbering is mislabeled. Change "1. Python IDLE" to "2. Python IDLE."

7.3 Create a Video Character

a. The intended take aways from the prompt "What do you see?" are not clear. (intellectual engagement; use of reasoning to make, defend, and critique claims)
    - Consider listing important observations about the code and strategies for eliciting these observations in the facilitator guidance.
    - Consider including sample questions facilitators can ask to encourage students to defend and critique claims about the code.
b. The discussion prompt "How would you create a character by specifying a row, a rectangle, or pixels?" might lead to a more procedural discussion. (meaning making)
    - Consider revising the prompt to focus on why each of these techniques is useful, e.g., "when would it be most helpful to use a row versus a rectangle versus a pixel in creating a character?"
    - Consider adding facilitator guidance for leading a more conceptual discussion.

c. The card does not include explicit suggestions for students to take turns or enact particular roles within the group (access).
    - Consider adding suggestions to take turns on the cards or in the facilitator guidance.
    - Consider specifying student roles for the activity.

7.4 Move a Video Character

a. The intended take aways from the prompt "Go through the code and discuss the code that produces the other 3 movements" are not clear. (intellectual engagement; use of reasoning to make, defend, and critique claims)
    - Consider listing important observations about the code and strategies for eliciting these observations in the facilitator guidance.
    - Consider including sample questions facilitators can ask to encourage students to defend and critique claims about the code.
b. The discussion prompt "How can you use move and copy to make an interesting video" might lead to a more procedural discussion. (meaning making)
    - Consider revising the prompt to focus on advantages of coding with the move and copy functions versus coding without them.
    - Consider adding facilitator guidance for leading a more conceptual discussion.
c. The card does not include explicit suggestions for students to take turns or enact particular roles within the group (access).
    - Consider adding suggestions to take turns on the cards or in the facilitator guidance.
    - Consider specifying student roles for the activity.

7.5 Discuss Level 1 Projects

a. Facilitators are asked to discuss their projects, but what they should share about them is not specified. (motivation)
    - Consider adding facilitator guidance about what features of the code for their final projects they should point out, and which features they should have students examine and discuss.
    - Consider showing the project videos at the beginning of this session, and sharing them again here with the focus on the code.
b. Students may be unfamiliar with (or have forgotten) the commands vid_show(), frame_list, and fps. (access)
    - Consider adding guidance to the facilitator materials for reviewing these commands with students, perhaps by running the code and having students observe and explain what they do.

a. The journal prompt "The team and summary expert will discuss what you learned in this session" is general and may not elicit the session learning goals. Also, the roles for the writing exercise in Section 4 might be confusing. (sense making, access).
    - Consider separating the expectations for the "team" and the "summary expert" to clarify what each is expected to do.
    - Consider providing more specific prompts, perhaps using sentence starters, designed to help students make sense of the commands used to code videos.

c. It is not clear whether the prompt "Which ideas do you want to implement in your project?" is designed to get students to decide which coding commands they want to use, or to come up with a concept or story line for their video. (access)
    - Consider revising the prompt to make its intention more explicit.