

Makersgram Memo

Makerspaces require documentation that show the dynamic nature of learning through artifacts. The Makerspaces Playbook provides ten methods of documentation with no official tool. While there are numerous tools for creation and different forms of documentation, there exists no mobile tool for documentation that scaffolds guidance within the creative scientific process. Students currently use a number of applications, wordpress blogs, or physical notebooks. One of the main challenges in makerspaces, from an educators perspective, is reconciling the learning documentation process with existing standards. For students, a makerspace portfolio tool, such as Makersgram, must be accessible in the realm of physical action, expression and communication, and executive functions.

Learners in makerspaces range from school students to community members continuing education, therefore the standards for each of these learners may diverge depending on setting. Makersgram must be flexible enough to accommodate each of these learners and their varying standards. For this particular project, the intended user is a high school student from rural Southeastern Kentucky with access to a mobile device or iPad primarily. This student would work either during school or afterschool in makerspaces on projects where they are guided by a teacher with a particular set of standards imposed by the state. In this case, the application and portfolio itself must be available even if the student does not have internet access. In order to provide multiple means of action and expression, it must incorporate means for physical action, expression and communication, and executive functions. This will be accomplished through a

student profile displaying number of projects, percentage of reflections completed, connections, skills mapping to standards, and a portfolio where each project is framed through four steps of creation: starting point, planning, problem solving, and solution.

Physical Action. During the initial launch of the Makerspace application, the user will encounter a brief, four step tutorial with an overview of its use. It is clear from the beginning that there are multiple methods for response and navigation available to the user to use at their own pace, accounting for their own strengths. There will be an initial suggestion to use a grid background during the starting point step to ease counting of materials. Users will be able to listen to text, use speech-to-text, and upload various forms of media representing their ideas. The text will also be enabled with spell check, grammar check, and predictive text through the keyboard or input method itself.

Expression and Communication. For user project documentation, they will be able to use multiple media for communication of each step of creation, including images, videos, text, and voice input. The format will emulate Instagram's post style with multiple uploads that can be swiped through, however it will allow for reflection under each upload rather than a static caption. Multiple strategies for planning and problem solving in particular will be evident through this technology. Users will be able to use multiple tools for construction and composition outside of the application, from calculators, sketch pads, CAD, music notation software, mathematical notation software or mathematical manipulations, and animations. Each of these methods of composition must be captured through images or videos in order to be uploaded to Makersgram. The scaffold of the four step structure allows for users to build fluencies with gradual levels of support for practice and performance.

Executive Functions. Makersgram will scaffold both lower level and higher level skills through the incorporation of reflection prompts, self-identification of skills, and teachers access to checklists for standards which will be shown on users projects if this is used within a classroom setting. It will guide appropriate goal setting through showing a percentage of reflections complete and providing prompts to estimate effort and resources. This application supports planning and strategy development through the inclusion of reflection prompts as well as allowing students to self-order the projects on their profile by their priority. It facilitates managing of information and resources by acting as a graphic organizer for data collection and systematizing reflections. It enhances users capacity for monitoring progress through both the percentage of reflections completed and the checklists of standards. Additionally, through allowing users to connect with peers who they collaborated with on various projects, it will more naturally allow for peer feedback by allowing them to save the projects for inspiration.

Why mobile? Makersgram must be available to a student with limited means and access to internet in order to be fully accessible. Mobile applications which can also be used on iPads allow for students to collect artifacts directly from the device and upload them immediately, rather than going through a multi-step process like a computer would require. Although there are existing applications for makerspaces, they do not fully encompass the UDL principles and guide students in makerspaces specifically. Most of the applications for these spaces are for-profit and have been scaled more broadly to be used in a range of classrooms. By the nature of its target user, this application must be free and accessible. It is not made to be scaled or produce profit. Although a similar application may help other creators across various industries, this will target makerspace users in order to enhance their experience via an ideally seamless integration.

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