STEAM Technologies Learning Centers

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ED 5081

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OVERVIEW:

Bridging technologies with STEAM together in a way that amplifies their effectiveness is through the utilization of learning centers that engage and prepare students in authentic situations. Using a number of resources to effectively develop and better utilize learning centers that involve content with real world situations and giving real meaning to what they are learning is an effective approach in preparing students for the world after they have graduated from my classroom. Creating engaging lessons that captivate learning with purpose is the motivational factor in using STEAM with technologies to foster tools and skills for my students to be life time learners with promising windows that open to gainful opportunities.

In designing my ideal learning center, I've considered three key areas; traffic flow, organization and placement of components, and the integration of technologies that support and foster the implementation of STEAM within a student-centered environment. My intention is to create an effective learning center, within my current art classroom for three through sixth graders, for the upcoming school year, allowing for versatility and adaptability (note the different coloring of learning center components in fig.1). Using color coded areas throughout the learning centers allows for quick reference points to communicate specific locations. Also, I am able to switch out the learning station tables with other activities and technologies to accommodate the instructional needs of projects, class time, and students while making adjustment to my teaching approach and applicable active student learning strategies.

Firstly, I took into account the permanent components such as the entrance, sink, cabinetry, electrical outlets, and projector. Knowing that these items will remain constant, I mapped out the placement of tables, work spaces, focal point, and supply areas to configure my learning center to optimize traffic flow. Next, I considered traffic flow and organization of classroom components to foster efficient transitions for better productivity in the classroom suggested by Classroom Caboodle. Classroom Caboodle (n.d.) says, "The Physical Flow… or how to "get around" becomes very important when you have a couple dozen children in one room who are all trying to take off coats, empty backpacks, hand in papers, move to and from the front of the room, etc" (Classroom Caboodle, n.d.). Navigating easily throughout the classroom reinforces safety, ease of movement, and allowing for easier transitions from one activity to another lessoning frustration and confusion. Also, having a good physical flow allows for more effective retrieval of materials, manageability of centers, and an inviting atmosphere to foster student centeredness with the integration of appropriate technologies. These technologies can range from a multiple array of resources. Kaplan (n.d.) states, "The type of technology, software, and accessories you choose for your learning center will strongly influence your students' digital learning opportunities" (Kaplan, n.d.). The type of technology implemented in my learning center range from computers to interactive boards to mobile devices with the integration of apps and software. Also, accessories and software components are considered to utilize the technologies and to accommodate all types of learners.

Like all learners, their developmental needs are better nurtured with an organized learning center. An organized learning center allows students to be more engaged in "play" while providing a variety of developmental supports to their learning.
According to Magnuson (2010);

> "Learning centers are areas within the classroom where students learn about specific subjects by playing and engaging in activities. Play is an active form of learning that involves the whole self. Even cognitive development… is achieved through child-initiated exploration and discovery" (Magnuson, 2010).

However, as students are involved with "play" of learning centers, the facilitator must be actively engaged in providing appropriate strategies and supporting elements to foster student independence.

Magnuson (2010) lists helpful guidelines for facilitators of learning centers,

- Observe
- Listen
- Ask questions
- Show what to do when help is needed
- Support first attempts
- Participate in activities
- Talk and have discussions with your students
- Help your students make discoveries and connections
- Share your knowledge and expertise (Magnuson, 2010).

In keeping organization in mind, I mapped out areas of the classroom, specifically, the focal point. Designing the Focal Point in the shape of a horseshoe defines the learning space supporting student attention and instructional material suggested by Classroom Caboodle (n.d.), Classroom Caboodle, n.d.);

> "The focal point in most classrooms will center on a teacher's primary instructional-delivery method…(and) the main instructional area must contain: No extraneous, distracting items, specific resources for the curriculum being delivered, and everything you and the kids need to get the job done…an instructional focus area should also be designed with the comfort and attention of the children in mind; First and foremost, kids must be able to see, as well as hear"" (Classroom Caboodle, n.d.)."

Placing the Focal Point at the front of the room will provide efficient accommodations for all learners and the involved technologies such as the Promethean White Board and projector to better provide optimal execution and delivery of information. Additionally, students' backs will be to the activity stations in hopes of lessening distractions during the time their attention is required for whole class instruction.

After determining the focal point of the classroom, I considered the areas that would require quieter activities. I placed the Writing/Reading/Creation area in the far corner of the room acting as a "nook." This area has reading material ranging from comic books to story books to fit all types of readers. I've included a number of bean-bags to provide comfort and relaxation for students while they engage in writing or creating their own stories in comic book or story book forms. 8 ½ x 11 support boards are at this station as well to accommodate students wanting to sit in the bean-bags while writing and creating their stories. I've also included a small round table for students that prefer to use a table.

Next, near to the Writing/Reading Creation area will be the Computer Area. According Kaplan (n.d.), "If you decide to integrate desktop computers in your classroom, your technology learning center will need to be more traditional and permanently located. Desktop computers usually encourage individualized learning and have a low noise level" (Kaplan, n.d.). This area will require a good amount of concentration to complete tasks optimizing student independence so minimizing noise is critical. Also, the integration of desktop computers will

provide additional opportunities for students to engage in different technologies and allowing access to software and websites that can be viewed more efficiently on desktop computers than on mobile devices.

In addition to the Computer Area, I've also placed in a Technology Area near the Computer Area. This area will provide classroom flexibility, but also an additional place to involve technologies such as mobile devices.

According to Kaplan (n.d.);

"Your technology center will be more modern and mobile if you decide to integrate portable technology in your classroom. This means that you can move your technology learning center to different parts of the classroom when needed. Keep your technology center close to quiet centers when activities support individual learning and move it to louder areas of the classroom when activities require group interaction" (Kaplan, n.d.).

Placing the Technology Area next to less noisy areas will provide an additional stabilization of support for students engaged in activities that require more focused attention.

In contrast of quieter areas, I've placed the Maker Space Area at the other side of the classroom to adjust for additional noise. This area will have a number of found materials that students can experiment, build, and disassemble. This area will have bins for small wood pieces, nuts and bolts, small cardboard pieces, electronic components, and other type of reusable material and objects. Additionally, this area will contain a workbench where students can build their creations or disassemble outdated electronics. To eliminate unnecessary use and waste of materials, Watson (2017) suggests:

"Rather than have students just gather up a lot of materials to glue or tape together, use task cards that would provide brain push-ups and explore possible projects that interested them… students can choose something that interested them to work on… to draw a picture of what they imagined, build a prototype for their idea, or actually create and make a finished project" (Watson, 2017).

This approach fosters the creation development of students in various stages while providing specific challenges that stretch students' abilities and skills while cutting down on wasteful use of materials. Additionally, Watson, 2017 says, "Controlling the consumption of supplies, (have) students first create a detailed plan for their project" (Watson, 2017). This approach provides better utilization of supplies, times, and direction fostering planning, researching, and proper thinking among students while engaging students in the engineering process; Ask, imagine, plan, create, and improve.

The next type of technology implementation in my learning center is a Green Screen Video Production Area. This area will support a number of creation elements to effectively plan and produce captivating videos engaging students in the storyboarding and video editing processes. Storyboarding will require students to apply point of view, dialogue, genre, telling a story with beginning, middle, and end, and various stages of video editing involving clipping, cutting, sound effects, title screens, and ending credits. I placed the Green Screen Video Production Area next to the technology area to better utilize the distance for students to edit their video clips in a location that best support their technology needs and completing projects efficiently. Whether a table or desktop computer is needed, they will be in proximity to students requiring these components. This area is designed for students to be creative, self-directed, and tech-centered involving the approach to video production supporting the ISTE Standards for Students (2018) "Creativity and innovation, communication and collaboration, research and information fluency, critical thinking, digital citizenship, technology operations and concepts"

(ISTE, 2018). In adding, the placement of the Green Screen Video Production Area allows for more even lighting for optimal video recording.

Locating the Painting and Drawing Creation Areas near supply cabinets of construction paper, scissors, glue, etc., provides convenience for students to easily retrieve appropriate material and providing easy access to a water supply for projects and necessary clean up. It also safeguards technologies away from materials that pose hazardous to them. At the drawing and painting stations, students are free to express themselves within the stations' guidelines while supporting the creative processes fostering thinkers and STEAM implementation.

Tarnoff (2011) states:

"In my experience as an executive and entrepreneur sitting on both sides of the creative/technology fence, I need to hire technologists who know how to collaborate in teams, express themselves coherently, I don't find these kids sitting alone at a lab table or buried in an algorithm. I find them taking art classes to understand how color and light really work… "A" skills in the 21st century actually apply to a larger, broader segment of the workforce than STEM skills" Tarnoff, 2011).

Finally, that last component to be considered is the teacher desk. I have placed my classroom teacher desk off to the side. Classroom Caboodle. (n.d.), says "it is best to locate it anywhere except your instructional focal point... arranging (first) everything else about your classroom to maximize student learning, then find a place for your desk" (Classroom Caboodle, n.d.). Also, an additional reason for placing my teacher desk off to the side of the focal point is to hold necessary school related items, such as attendance forms, project forms, lesson supplies, or an additional work space allowing for quick retrieval of items or necessary accommodations for student needs.

After creating the layout of my learning center, I'm able to envision the learning I want my students to experience. With ease of traffic flow, well organized components, and implementation of technologies will support student engagement while creating flexibility and adaptability within the construct of this learning center layout fostering student centeredness and the needs of all learners. Creating my learning center floor plan will help me better navigate my students toward successful achievement suggested by Magnuson (2010), "Figure out what the children are trying to achieve and how best to help them achieve it" (Magnuson, 2010).

In summary, creating a learning center that is highly rich with technologies and resources to engage students in 21st century learning is paramount in today's educational settings and bridges technologies with STEAM to amplify their effectiveness and better utilization of learning centers that engage and prepare students in authentic situations. Due to the ubiquitous of technology, educators need to have a strong grasp of future trends to better lead, engage, train, and prepare students for a world that is yet to exist.

Dias (1999) states:

"…technology is integrated when it is used in a seamless manner to support and extend curriculum objectives and to engage students in meaningful learning…The primary goal is not to use the technology; rather, the goals are to engage students in meaningful learning and assess their understanding…technology enriches (activities) and enables students to demonstrate what they know in new and creative ways." (Dias, 1999).

Implementing technologies that are access, facilitative, and adaptive will provide critical tools to drive education content supporting teachers and all learners in a personalized learning classroom toward the main goal of: A meaningful and rich environment where teacher and all learnings personally and collaboratively possess the ability to facilitate and manage goals and choices

within a qualitative educational setting. Because students are embarking upon a world that demands extra, Friedman (2014) states, "You can't just be a non-routine worker, but a creative non-routine worker...."(Friedman, 2014). The current and future job markets require creative individuals that can provide solutions. Average is over and to effectively provide the scaffolding necessary for students to achieve above average necessary, implementations of learning centers involving highly rich technologies and resources compounded with STEAM will add the "extra" students need while they make connections with authentic situations that will provide them with necessary tools ensuring their successes throughout life.
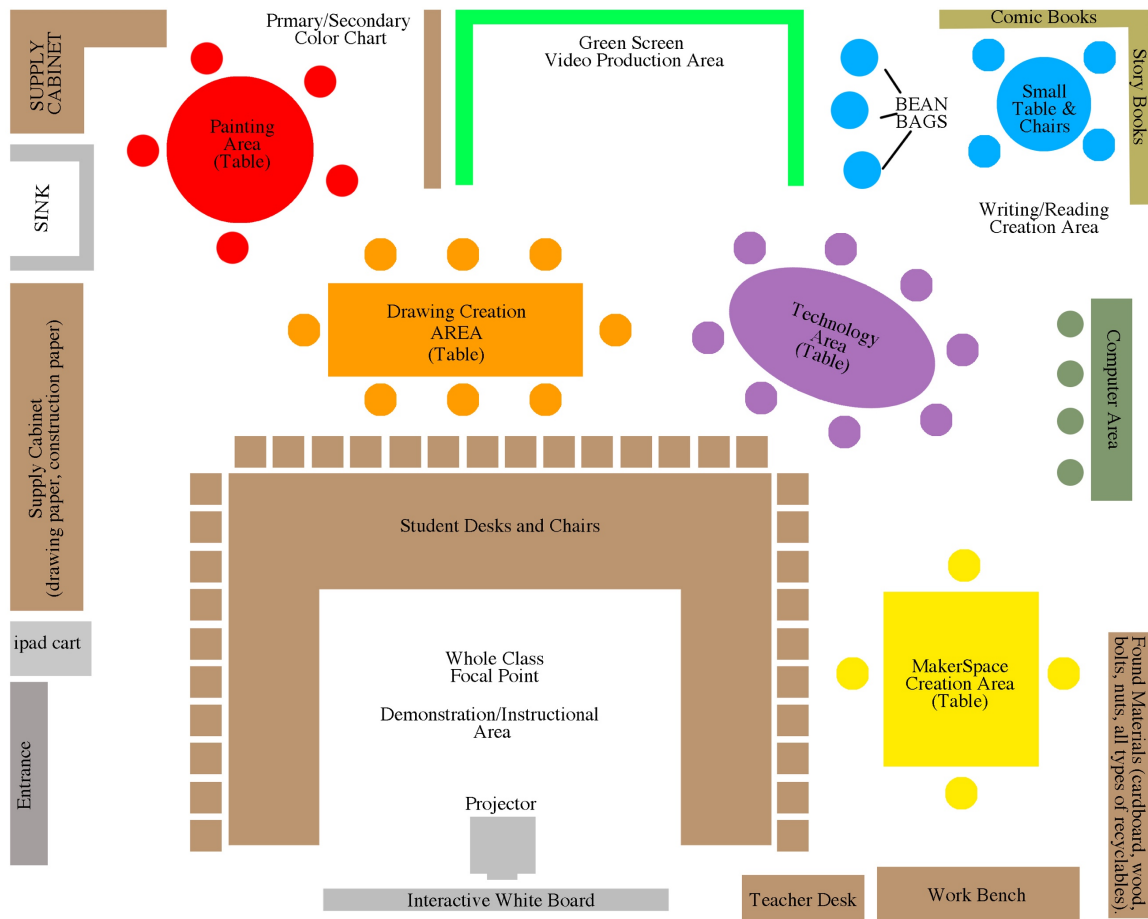
(Fig. 1) Diagram created with Adobe Photoshop

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