Organizing Physical Space

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The model classroom is inviting, orderly, and safe for all students and the teacher. Lessons are streamlined by appropriate configurations of furniture and classroom equipment and by creating activity areas and favorable seating arrangements. Classrooms for older students are enhanced by desk orientations that promote collaboration and offer clear lines of vision to the teacher. Charlotte Danielson (2011) asserts that "physical safety is a primary consideration of all teachers" (p. 44). The teacher is responsible for reporting and checking on essential maintenance work such as broken electrical plugs or damaged furniture. Well-maintained classrooms avoid distractions such as flickering lights and unwanted noise from buzzing electrical appliances. The arrangement of furniture and equipment is a major contributory factor for a safe classroom. Students need to be able to move between work areas freely and avoid collisions with both furniture and classmates. Thoughtful positioning of shared storage areas and equipment avoids backlogs of people and time delays.

Hands-on approaches to learning require that classrooms are organized so that furniture and materials can be positioned to accommodate instructional goals. When investigating hands-on activities, students are presented with concrete materials that provide them with a model for abstract concepts. Classroom manipulatives such as base ten blocks, fraction strips, or other objects captivate the senses of sight, touch, and sound, engaging the needs of multisensory learners. These materials can be presented to students in small group situations or may be utilized in learning centers. At these designated areas of the classroom, students are supplied with the necessary materials to complete tasks within a specific time frame.

Advances in technology and the introduction of the Internet in schools have led to a need for educators to designate space in the classroom for computers as well as devices such as projectors, interactive whiteboards, student response systems, and videoconferencing equipment. Educators must also shift to a more facilitative method of instruction as "the immense quantity of information available and easy access to social networks have weakened the link between schools and learning and therefore modified the traditional teacher-student scenario" (Kuuskorpi & Cabellos González, 2011). By creating options for the way classrooms are structured, the materials that students interact with, and the changing role of the teacher, instructional strategies can be customized and adjusted to meet individual student needs.

Information Alignment

Materials presented in this eBook align with the following:

Module Questions

- How can teachers analyze student needs for and create a safe physical environment in which all students can experience classroom events?
- How can physical resources be used to support learning activities?
- How can students use physical resources to advance their own learning?

Learning Outcomes

- Analyze student needs for a safe physical classroom environment.
- Explore how to create a safe physical environment in which all students can experience classroom events.
- Examine how physical resources can be used to support learning activities.
- Discover how students can use physical resources to advance their own learning.

Topic Focus

Analyzing Student Needs for and Creating a Safe Physical Classroom Environment

- Importance of Safety and Accessibility
- Arrangement of Furniture

Physical Resources to Support Learning

- For Hands-on Learning
- Digital Tools
- Field Trips and Guest Speakers

Physical Resources to Advance Learning

- Classroom Environment
- Use of Digital Tools
- Projects

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At time of publishing, all of the website information was accurate. Due to the nature of the internet, some of the website information may have changed or become unavailable. Please see the references section of the corresponding online module for the most up-to-date information.

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Analyzing Student Needs For and Creating a Safe Physical Classroom Environment

Most accidents are from causes that could happen almost anywhere on a school campus. The Centers for Disease Control and Prevention (2012) cites "falls" as the resoundingly most common cause of accidents for 0-14 year olds and "strikes with objects or persons" as the second to most common. For 15-19 year old students the order is reversed, with strikes by objects or persons being the most frequent cause.

The Royal Society for the Prevention of Accidents (ROSPA) (n.d.) reports that the most frequent causes of accidents in schools are playground falls and slips on smooth surfaces. ROSPA encourages a proportional and planned approach to safety, noting that schools should be "as safe as necessary, not as safe as possible." For example, students should not be allowed to run around at break time with the acceptance that there are inherent risks, even when supervised. Conversely, icy paths or wet tiled floors are not acceptable risks and should be rectified. Schools need to accept a duty to safeguard students and employees within a "risk aware, but not risk adverse" culture. Risk-taking is a disposition that is valued by many educators and should be apparent in safety education within the school curriculum.

Importance of Safety and Accessibility

Optimal distributions of classroom resources occur when consideration is given to the frequency of movements around an available space. Access to network and power connections, pencil sharpeners, writing folders, and class libraries are just a few of the resources that necessitate circulation of students. Poorly distributed and managed resources may result in frustrations and the increased likelihood of accidents.

Storage of personal effects. Some organizational features of smoothly operated classrooms are non-negotiable for both teachers and students. Coats, sports equipment, and backpacks can clutter any classroom if not stored efficiently. Misplaced personal belongings will both disrupt the flow of the lesson and cause accidents if students trip or collide with furniture. Secondary school subject teachers generally need to ensure that students leave bags and coats in their lockers or coatroom facilities. Many elementary classrooms are designed with coat pegs and shelves for storing bags. In this case, the teacher has to reinforce a routine in which students deposit their belongings as they enter the room. Teachers may need to be creative at finding storage solutions when the room is lacking designated facilities. Teachers may acquire plastic storage bins or crates for each small group to tidy away their bags and coats until the end of the class session (Clutter-Free Classroom, 2012).

Procedures for movement in the classroom. Movement within the classroom is an essential not only for routine procedures, but also for enhancing student engagement in activities. Students need the ability to move around the classroom in order to complete assignments. The sleek operation of basic classroom activities is promoted by procedures that students understand and follow. Long lines of students wanting to sharpen pencils or wash paint brushes are wasteful of student time and likely to result in disagreements and noise. Optimal positioning of resources needs to be supported by agreed procedures. For example, only two students are allowed at the pencil sharpener station at any one time.

Attention to special needs of students. Accessibility and ease of movement are essential factors for students who may need special facilities or optimum working conditions in order to maximize their engagement with assignments. Lavoie (2007) singles out the challenge that many learning disabled students encounter when trying to apply organizational skills. Extra support may be needed for these students in order to ensure that their coats, books, and assignment papers are stored away in designated places. Students using wheelchairs need obstruction free pathways in order to safely negotiate their way around the room.

Electrical and network outlets and cords. Electrical cables should be maintained in good order. Extension cords should not be used as permanent solutions for connecting appliances (Occupational Safety and Health Administration, n.d.). Cables that trail across floors, under carpets, through door entrances, or adjacent to sinks are especially hazardous. Multi-adaptors that connect several appliances to one electrical socket may cause overheating and fire. Generally, the teacher is limited by the outlet points provided in the classroom design. Where possible, appliances should be positioned as closely as feasible to a convenient electrical or network outlet in order to reduce the hazards from trailing cables.

Safe handling of chemicals in science classes. The American Chemical Society (2011) advises on a number of simple measures that enhance safety in elementary school classrooms. Science classes involve some inherent risks even when materials are restricted to household chemicals and equipment. The use of students' safety goggles should be enforced whenever there is risk of splashes, dust, or sharp objects. Without goggles, students are likely to introduce irritants when they rub their eyes. Goggles should be stored cleanly and hygienically in order to preserve the clarity

of lenses. Frequent disinfecting may be necessary to prevent transmission of eye infections. Chemicals should be clearly labeled and stored in laboratory containers, never in recycled food containers. Teachers should check the risk-assessment for any science procedure that is unfamiliar.

Arrangement of Furniture

One glance in a classroom, even when students are not in session, offers the experienced educator insight about the teacher and learning activities. Strategically minded teachers use pedagogical intent to guide the choice of classroom layout. Arrangement of desks and other furniture is reflective of the teacher's teaching style and envisaged student activities (Shalaway, n.d.). Small group collaboration works well when tables are organized in clusters. Circles or horseshoe shapes position all students in a front row seat for whole-class discussions. Learning stations are appropriate for activities that necessitate rotation around the room in order to access designated resources. Student learning preferences may be incorporated in classrooms that feature options, such as a quiet reading area, a discussion corner, or a place to listen to music. Skilled chefs, carpenters, and electricians work efficiently by ensuring that equipment is conveniently stored and maintained; students in the classroom benefit from that same mindset. When required equipment and materials are readily accessible, activities are conducted with minimal delays. Unproductive time such as waiting for basic items like scissors or glue is easily avoidable by the creation of well-positioned storage points and routines for their usage.

Eye contact and uninterrupted lines of sight should be considered when positioning desks and chairs. Students need a good vantage point to view the position from which class announcements or board work normally occurs. Additionally, temptations for off-task or disruptive behaviors are reduced when students know that the teacher has a clear view of all class members.

Stronge, Tucker, and Hindman (2004) recommend that plans for classroom layout begin with a consideration of fixed and moveable features. Some teachers find a sketch plan of the room helps decide where to place desks and other mobile resources. A list (such as that shown in Figure 1) can be helpful in identifying likely access routes and good lines of sight.

Fixed Resources	Moveable Resources
Doors	File cabinets
Windows	Desks
Mounted writing boards	Work stations
Support pillars	Rugs
Built-in storage	Pencil sharpener
Sinks	Unfixed shelves
Network points	
Power outlets	
Mounted TV's/ projectors	

Figure 1. Fixed and moveable resources.

A sketch showing the fixed classroom resources and features may be superimposed with desks and other moveable features. Walkways and frequent routes used for student activities may be sketched on the floor plan. Anticipation or observation of backlog and busy areas enables adjustments to be made in the layout of the room.

Physical Resources to Support Learning

Classroom materials should provide students with multiple means of representation, engagement, and expression. Universal Design for Learning (UDL) recognizes that the learning needs of all individuals are different and that an effective teacher uses a range of classroom strategies, assessment types, and materials to address the needs of varied learners. The importance of using multisensory material is underscored by Reif (1993) who states that students retain:

- 10 percent of what they read;
- 20 percent of what they hear;
- 30 percent of what they see;
- 50 percent of what they see and hear;
- 70 percent of what they say;
- 90 percent of what they say and do.

For many students, using concrete materials illuminates concepts that can be difficult and confusing. Other students may respond to the audio or visual cues associated with using digital resources or will be energized and engaged by interactions with others when participating in events like field trips or engaging with guest speakers.

For Hands-on Learning

Hands-on learning is an educational method that requires a student to physically engage with objects to promote learning. Learning by doing engages students and allows them to become personally invested in their learning. The experiences require learners to use multiple senses and to rely on their own abilities to obtain knowledge. Students use visual, auditory, and tactile cues to make connections between concrete objects and curriculum concepts.

Hands-on learning may require adjustments to the physical classroom environment as well as placing an emphasis on a collaborative student-centered model of instruction. Educators may find themselves arranging furniture to accommodate small groups or the use of learning centers, as well as locating additional storage for manipulatives. Grouping students to work in small teams can have an added benefit of promoting collaboration among and between students. When students work together "they are validating their understanding of the material being learned and, often in ways that adults are less successful, helping their peers to build and master new skills" (Cleaver, n.d.).

Manipulatives. Using physical models to represent their thinking assists students in moving from concrete experiences to abstract reasoning. Educational theorists such as Piaget suggest that students move through three developmental learning stages: the concrete, the representational, and the abstract. In the concrete stage, a concept is introduced and explored through the use of manipulatives. In the representational stage, students draw pictures (e.g., letters, numbers, tallies) to replace the concrete objects until they reach the abstract stage and are able to communicate concepts using symbolic, content-appropriate language.

Manipulatives, such as pattern blocks, cubes, or other objects provide concrete representations of abstract ideas. They allow students to see, touch, and move real representations of conceptual ideas. They also engage the senses of sight, touch, and sound, addressing the needs of multisensory learners. Students using representations develop a firm foundation in thinking and reasoning skills. Their moveable nature provides students with an opportunity to try various ways to solve problems and make mistakes while building connections. Practice in choosing appropriate manipulatives increases students' skills in identifying the correct tools for solving a problem.

Learning centers or stations. Learning centers, or learning stations, are designated areas of the classroom where students use instructional materials to accomplish tasks. At each center, the students are provided with the necessary supplies to complete an activity, either as individuals or in a small group. Students explore the center materials according to a required order of rotation and must complete set activities within a specified time frame.

When planning the centers, teachers need to keep the learning objectives in mind. Careful planning of the content, the processes needed for learning, and the expected end products will determine whether the activities are meaningful, not the result of fun that does not meet the stated goals. Movitz and Holmes (2007) cite the following considerations for planning:

- Establish and articulate clear, measurable goals for the activity.
- Plan worthwhile learning outcomes; the students should be able to articulate, reflect on, connect to, or apply meaningful knowledge following involvement in the activity.

- Develop an activity important enough to merit assessment, including informal observation.
- Ensure that the students can work independently without a great deal of direct instruction.

Another consideration is the amount of movement in which the students will engage. Some classroom environments may allow for the setup of timed stations through which that students will rotate. Those whose classrooms do not allow for rotation may elect to place the supplies for each activity in a basket, and then pass the baskets from group to group instead of moving the students.

While most educators think of the use of learning centers as an activity specific for the elementary level, they can be very effective with middle and high school students as well. Learning is more meaningful, of course, when students are actively engaged.

Digital Tools

The physical learning environment typically indicates the spaces, equipment, and tools within a school building. Kuuskorpi and Cabellos González (2011) cite that physical environment has evolved into "an even more complex structure that includes teaching equipment, sources of information and events outside of schools, where students can take part in the learning process both directly and virtually." Developments in communication and information technology have resulted in changes in pedagogy, marking a distinct move to learning that takes place beyond the school walls. A more traditional pedagogical approach places the teacher as the holder of wisdom; transitioning to a more facilitative role in the classroom requires that the teacher harness the immense quantity of information available online and take advantage of the capacity for 21st Century learners to communicate and collaborate using digital tools.

Emerging technology encourages educators to make shifts in their teaching methods and requires changes in the way classrooms are arranged. Student-centered instructional models require dynamic teaching spaces with flexible layouts and furniture arrangement that facilitate individual, pair, and group work methods. The elements of a dynamic teaching space demonstrate the emphasis on technology integration and flexible grouping (Kuuskorpi et al., 2011).

Classroom Space	Teaching Space
• Static space • Permanent furniture solutions • Content-driven work methods • Technology confined to specific areas • Emphasis on individual work	• Dynamic space • Flexible furniture solutions • Context-driven work methods • Technology integrated into the space • Emphasis on individual and group work

Figure 2. A Dynamic Teaching Space Concept.

Personal computing hardware as well as the need for presentation and collaboration tools also require modifications to the physical environment of the classroom. Desktop computers require dedicated learning space within the classroom, while mobile devices such as laptops, tablets, and eReaders may be shared among several classrooms and may be stored at a central location within a school building. Dependent upon funding, teachers may have to modify the environment in the classroom to accommodate:

- Digital projectors to display content.
- Document cameras that project 2D and 3D images for classroom viewing.
- Web conferencing or videoconferencing equipment that connects students to the global community.
- Student response systems, commonly referred to as *clickers*, that allow educators to engage students in the classroom and assess comprehension of content.
- Interactive whiteboards that support multiple learning styles and encourage students to interact with content.

Many educators are learning about the potential that digital learning has within the curriculum. Students are able to quickly access information, and computer-based instruction can provide instant feedback to students as they progress through their instructional goals. Online learning has provided the potential for students to participate in courses that cannot be offered at a school for logistical reasons, or to take Advanced Placement (AP) or other courses for college credit.

While the expense of technological equipment can be cost-prohibitive for districts, there are an abundance of low-cost or free web tools available for educators. These tools can be integrated into the curriculum to allow students to consume, collaborate, and produce information. Collaboration tools such as *Google Documents*, *Edmodo*, and *Dropbox* allow students to create, edit, and share information in real time, while digital presentation tools like *Prezi* and *YouTube Editor* can be used to prepare and present projects tied to specific instructional outcomes. Teachers may find it convenient to use a backchannel utility like *TodaysMeet* to encourage group discussion and to elicit feedback from students during instruction. Examples of other more teacher-centric services include *Engrade*, a service for managing curriculum, assessment, and content, and *ClassDojo,* a management tool built to capture and generate data on student behavior. A simple web search can locate hundreds of applications that will assist educators in effectively integrating technology in the 21st Century classroom.

Field Trips and Guest Speakers

Many educators and administrators immediately discount the value of field trips. In some instances, it is difficult to validate the educational benefits, and field trips may be perceived as a frivolous extra. Critics of field trips would likely point to the expense, the logistics, and most importantly, the notion that these adventures take away from valuable instructional time. When used in support of the curriculum, field trips can connect instructional topics with the larger world. Mayger (2009) asserts that successful field trips are contingent upon several factors:

- Scheduling the trip at an appropriate time
- Preparing students for the trip
- Engaging students in meaningful activities during the trip
- Conducting relevant follow-up activities

Care should be taken to schedule the trip when relevant topics are being taught in the classroom and the learning is fresh in the students' minds. Educators should take time to familiarize students with the venue prior to the trip and to spend time developing prior knowledge and sharing expected outcomes. If students are aware of the information for which the teacher will hold them accountable, they will be able to focus their attention appropriately throughout the experience. Following the trip, students should engage in more than a perfunctory discussion about what they enjoyed; well-planned follow-up activities should help students extend their learning and make valuable connections to the curriculum.

Teachers may also elect to bring the world into the classroom by inviting a guest speaker to share their expertise with content. An internal visit could be scheduled so that it does not compete with a school's instructional or testing timetables. Doing so can also be a more cost-effective option because there is no necessity for travel or accommodations. Funding for field trips and guest speakers is generally not included in school budgets. Most often educators are reliant upon parents or fundraising activities to finance these events.

A 2009 report indicates that approximately 30 percent of schools in the United States have adopted videoconferencing (Scholastic Teachers, n.d.). Virtual field trips allow students to connect with traditional venues, such as museums and zoos, and to interact with subject matter experts and other classrooms both locally and around the globe. Although there are videoconferencing systems that can run into thousands of dollars, there are also a multitude of low cost or free Web 2.0 tools that can provide many of the same features. For a fraction of the cost of an expensive system, educators can utilize the free Skype videoconferencing service and use an inexpensive webcam to link directly to an endless variety of opportunities. Many virtual field trip providers will work directly with teachers to customize events to address their instructional goals.

Physical Resources to Enhance Learning

The effective teacher recognizes that lesson plans and instructional goals are better supported when the classroom environment, equipment, and resources are optimally organized to support learning. Classroom configuration is a major factor for successful learning in early childhood facilities and important at all grade levels. The fabric of the building and fixtures such as doors, windows, lights, sinks, and power sources cannot be changed. The arrangement of furniture, accessibility to classroom technology, reduction of noise levels, furniture layout and wall displays are a few examples of features that the teacher is able to control and enhance in any classroom.

Classroom Environment

Charlotte Danielson (2009) points out that the effectiveness of instruction is enhanced when "the furniture arrangement is conducive to the activities planned for the lesson." Resources such as projectors, computers, and flip charts should be made accessible and clear of pathways. Color coding or clear labels may be used to designate the configuration of furniture and equipment for a range of activities, such as small-group or whole-class instruction. Such permanent organizing features empower students to adjust the classroom environment between activities. The well-organized classroom features distinct quiet areas that enable students to work with minimal distractions. Established pathways around the classroom promote easy traffic flow and reduce the likelihood of frustrations and conflict.

Teachers may suspect that excessive noise levels are prejudicial to concentration and academic work. In England and Wales, a controlled study used standardized tests of literacy, mathematics, and science to examine the impact of "chronic exposure to external and internal noise on the test results of children aged 7 and 11" (Shield & Dockrell, 2008). External noise, especially from individual events, had a "significant negative impact upon performance." The negative effect was greater for students at the higher end of the age range studied. Background noises within the classroom were also detrimental to test scores.

The American Speech-Language Hearing Association (ASHA) (n.d.-a) reports that poor classroom acoustics can affect:

- speech understanding
- reading and spelling ability
- behavior in the classroom
- attention
- concentration
- academic achievement

Background noise originates from many sources "such as traffic, lawnmowers, children on the playground or in the hallway, heating or air conditioning units, audiovisual equipment, or other students." Students with hearing loss, English language learners, and those with learning disabilities are disproportionately affected by background noise. Teachers also need to be aware of the strain on their voices when talking at higher volumes in order to cope with adverse classroom acoustics. "Teachers are 32 times more likely to have voice problems compared to similar occupations." ASHA offers practical advice to help teachers dampen noise in the classroom (ASHA, n.d.-b). Some tips are shown in Figure 3.

Acoustic Dampers	Furniture and Equipment	Class Management
Rugs or carpet	Arrange furniture at angles	Model quiet talking
Curtains or blinds	Fix noisy equipment	Coach speaking and listening
Corkboard display walls	Close windows and doors when possible	Avoid mixing noisy and quiet activities
Cushion tips for chair legs		Use visual cues
Ceiling-hung artwork displays		

Figure 3. Tips for a quieter classroom.

Students with visual impairments may benefit from adjustments to classroom lighting (Willings, 2014). Ceiling lighting is a fixture of the classroom and cannot normally be changed. Simple measures to improve the experience of individual students are possible. For example, glare is distracting for all people and is especially challenging for students who experience visual impairment. Even distribution of light on the visual task provides optimal working conditions. Some suggestions for reducing the negative effects of glare are shown in Figure 4.

Source of Glare	Suggested Solution
Windows	Use blinds or curtains
Ceiling lights	Fit diffusers or shades
Shiny tabletops	Use light-absorbing tablecloths
Chalkboards/marker boards	Angle the board or close a blind
Glossy paper	Use a matte finish
White paper in books	Provide yellow-tinted acetate sheets or sleeves

Figure 4. Suggestions to reduce the effects of glare.

Individual students may be aided by the provision of task-specific lamp lighting directed from the opposite side to the dominant hand. Halogen or the latest LED lamps offer good color definition and operate without flicker. Permission to wear a baseball cap or visor may also be helpful. Teachers can improve the delivery of instructions by choosing a well-lighted location in the classroom. The ideal orientation provides light to illuminate the teacher's face and avoids the silhouette effect that results from standing in front of a window.

Lawrence Berkeley National Laboratory (n.d.) cites research to indicate that classroom ventilation rates are linked to both student performance and rates of absence. The concentration increases of carbon dioxide breathed out by occupants in poorly ventilated rooms is directly responsible for drops in measured academic performance by students in the range of 5 to 10 percent. Comfortable temperature levels are also necessary for optimum engagement and learning.

Use of Digital Tools

Mobile learning technologies empower students to advance their own learning within and outside the classroom. Portable devices such as tablets, smartphones and netbooks, using Wi-Fi or connected through 3G and 4G telecommunications networks, enable students to prioritize their own learning schedule in the classroom, study hall, on the school bus, and at home (Wylie, n.d.). Students are able to use these versatile devices to communicate and collaborate, research information, and play multimedia resources. The convenience of using freely available online dictionaries and encyclopedias as well as downloaded e-textbooks saves the need for carrying bulky books to and from school.

Interactive whiteboards are digital display tools with the added advantage of user interaction. Dedicated software enables the teacher or students to make additions, edits, connections online, and to rearrange data. Cruickshank (2007) details some of the recommended features that interactive whiteboards offer in the classroom:

- Viewing videos
- Digital storytelling
- Teaching research skills online
- Using map and satellite imagery
- Working collaboratively
- Analyzing physical education activities
- Displaying artwork or online museum presentations
- Creating and editing multimedia presentations in real time

Marzano (2009) reminds teachers that interactive whiteboards are ultimately no more than an additional pedagogical tool. Such tools will not automatically increase the level of student achievement. Teachers need to use interactive whiteboards in conjunction with all the best practices that the effective teacher uses for sound planning and delivery. Only then will the opportunities offered by interactive whiteboards enhance the effectiveness of instruction.

Projects

Project work offers students an extended timeframe to pursue ideas, often collaboratively, and with the use of higher order learning skills. The Buck Institute for Education (2011) asserts that meaningful projects involve presentation to an audience. Student motivation and the quality of authenticity are raised when students present projects in person, using static or multimedia displays, or reach a wider audience through Web pages, wikis, and online videos.

Traditional displays such as posters, handmade books, and large wall displays are still valid in the modern classroom and continue to capture the imagination of students. Projects that include a process and a product are important elements for an audience. The essential element of all project displays is that they are assigned a prominent venue and audience. Gallery walks ensure that student work is shared with classmates. Displays in entrance halls, corridors, or cafeteria/dining areas offer exposure to the wider school community.

Most teachers and students are familiar with the linear presentations that may be created in slide-view applications such as PowerPoint. The National History Clearinghouse (n.d.) contends that Prezi offers presenters the opportunity to collaborate online and create more exciting and responsive presentations for audiences. It also enables the viewer an opportunity to leave and return to established pathways during a presentation. The facility to group components of projects and navigate multiple pathways enables easy transitions from graphic organizers to dynamic displays. Cognitive processes used to pursue project goals may be reflected in the presentation. The relative importance of items in the presentation can be emphasized by zooming in and out and by the sizing of components.

An extensive selection of free Web-based tools is available for students to both develop content and share results of projects. Larmer (2014) offers some advice for online applications that are likely to be successful for students:

- Mastery of technology tools should not supplant learning outcomes
- Tools should be intuitive and easy to learn
- Students should be empowered with free choice of technology tools

Tools that include both elements of project management and the facility to share and display are especially effective. In order to access a wide audience, the sharing element should be easy use. Some possible tools are shown in Figure 5.

Tool	Uses
AnswerGarden	Brainstorm ideas, give feedback, and use as a poll or guestbook
Scrumy	A simple project management tool
Socrative	Work collaboratively using smartphones, laptops, and tablets.
Google Drive	Securely share, collaboratively create documents, and spreadsheets
Edmodo	Engage in discussions, share links, files, and presentations

Figure 5. Online tools for student project work.

Conclusion

Classrooms are the stages upon which teachers' learning plans come to life. Careful management of the instructional environment is a major factor to promote successful learning and a positive experience for students. Only the fortunate teacher is allocated the perfect classroom with ideal features and ambience. The skilled classroom practitioner adapts the room in order to optimize the potential for learning. Simple measures to control light, noise, heating, and ventilation can be significant in maintaining student comfort and engagement.

Time taken at the beginning of the year to organize furniture, equipment, and display areas will pay dividends in terms of contented students and harmonious working. Poorly organized classrooms may be unsafe when equipment is poorly placed and walkways are obstructed; the lack of established systems leads to clutter and frustration. The pinnacle of effective classroom organization occurs when students are able to take responsibility for the classroom facilities and make adjustments in order to begin new activities and further their own learning.

Conclusion

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