Accessing the General Curriculum by Participating in Research Activities

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Abstract

Ability to conduct and explain research is a part of the national and state standards for the transition of students with disabilities into adult life. Universal design for learning is a means for encouraging and accessing the general curriculum for students with disabilities and to develop student understanding of how to conduct and share research. Students learn to navigate online library websites, read and interpret research, and work with other students to present and communicate their findings. The framework provided in this article will encourage student develop skill in working with others, strengthen understanding of research, assume ownership of their education, communicate ideas, and take responsibility for their own active learning.

Keywords: physical disabilities, learning disabilities, general curriculum access, universal design for learning, research

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Legislation that increased the participation of students with disabilities in general education classroom activities created a need for collaboration between general and special educators to meet course of study requirements. Working together, general and special educators endeavor to deliver instruction appropriate to all students. Skill in conducting research is one of the skills students need to master. Understanding of research literature along with expectations technology use has led teachers to examine methods and strategies along with new ways to access and discuss research literature within the general education classroom environment. New ways to stimulate and assess student understanding are necessary.

There are many physical disabilities and conditions that impair a student's mobility and movement. Due to the nature of a disability, this may result in reduced access to the general curriculum and to meaningful collaboration with classroom peers. Reduced access may result from inability to change posture or move arms effectively. Muscle weakness or tightness, involuntary muscles spasms, stiffness, pain, or other impairments may affect a student's participation in classroom activities. It is increasingly important for teachers to understand the needs of students with physical disabilities to allow for equal participation with nondisabled peers in research activities required by state and national course of study standards. Other students with physical disabilities also have learning disabilities, such as dyslexia or dysgraphia, which affects ability to read text, organize thoughts, or write.

No research was found on the keywords of research and discussion activities for students with physical disabilities in the general education classroom. A second search using the keywords, "physical disabilities", "panel discussion", and "research" yielded two studies. The research and discussion activities found were focused around the disability with a panel of individuals discussed their particular disability to promote awareness of their disabilities. The first study discussed an action research activity that was conducted regarding, but not by, students with physical disabilities. The second study reported the experiences of a college student with disabilities who served on a panel discussing his quality of life (Guenther, 2005). Students with disabilities are expected to achieve state and national standards. Research is needed to determine best practices for the participation of students with physical disabilities in classroom activities including research techniques and ways to facilitate communication with nondisabled peers.

Given the dearth of research and opportunities for group research for students with disabilities, this article examines universal design for learning to access the curriculum, the research process as a transition skill, and how to develop research, communication, and technology skills. The purpose of this article is to present a collaborative framework to support student participation in group research activities and include appropriate supports to increase access to postsecondary transition outcomes for students with physical disabilities.

Universal Design for Learning to Access the General Curriculum

Students with physical disabilities may find it difficult to participate in group research activities due to physical barriers. They have a desire to contribute to the fullest level of their ability, but encounter barriers that result in total dependence or require full-time or part-time assistance in order to participate in class activities. Equipment, computers or electronic technology, designed to assist with communication may be necessary to help these students with talking or other facets of communication. Within the collaborative general education environment, special educators explore ways to ensure equitable access to assignments, comfortable activities that do not fatigue the student, and how equity can be achieved through technology (O'Brien, 2007).

Innovative approaches to technology use were suggested by McGuire, Scott, & Shaw (2006 to enhance access to the general education curriculum via universally designed instruction. These technologies are instant and widely available. Universal design for learning (UDL) focuses attention on instructional practices (King-Sears, 2009). According to King-Sears, use of UDL may occur more often in the general education setting. Equitable use of technology and materials can be achieved via technology to design efficient, comfortable activities that do not fatigue the student.

Shaw (2011), Marino, Israel, Beecher, and Basham (2013), and McGuire, Scott, & Shaw (2006), discussed multiple ways to use UDL with students with disabilities, including representation, engagement, and expression. According to McGuire, Scott, & Shaw (2006), several principles affect student UDL and student participation. Simple and intuitive instruction is a major principle of universal design for instruction. Instruction should be designed to reduce excessive complication, taking the student's abilities and disabilities into consideration. Information on the student's needs and abilities is necessary and should be communicated in the instructional design to insure the understanding of the student with physical disabilities. The instructional design should include activities that do not require unnecessary physical exertion and do require less bodily effort for the student to participate. Multiple means of representation should be examined to ensure the use of appropriate accessible electronic materials for students. Classroom activities should be designed to promote interaction and communication between students and include all student abilities and levels of participation in the general instructional environment. Multiple means of engagement should include web searches, reading, and small group discussion. Multiple means of expression such include the use of group research and group presentations and multiple formats for communicating and sharing findings. Multiple means of expression will insure equitable access to participation for all students.

As a part of the planning process, the general and special educator need to view the student with physical disabilities in regard to achieving academic standards. They must consider what challenges the student will experience and how to support the student and overcome challenges. They must ask questions such as, Will the student encounter difficulty in accessing the content or in communication with peers? What accommodations will the student require? What technology will be required for the student to gain access to the materials? Planning requires knowledge of the student, standards, and access to a variety of technologies in order to make the learning accessible and engaging for all students in the classroom.

The Research Process as a Transition Skill

The primary objective of public school education is to prepare students for the transition into adult life after graduation (Prater, 2017; Hess, 2015; Rambler and Ouimette, 2016). For students with physical disabilities, transition related activities should focus on age-appropriate academic goals, and the academic needs and functional abilities of the student. State and national course of study standards outline student goals for conducting original research. These goals include collecting information, reading and understanding the information collected, synthesizing, evaluating and summarizing ideas, and answering questions (Hess, 2015). Current educational reform and legislation is focused on college and career readiness skills for all students, including students with disabilities with the end goal of developing employability skills (American Institutes for Research, 2016; Rammler and Ouimette, 2016).

The employability skills outlined by the American Institutes for Research include effective relationships, workplace skills, and knowledge skills. Prater (2017) presented goals to teach students with disabilities to advocate for themselves using state and national standards for persuasive writing. Prater examined an English language arts standard that included analyzing text to support an argument. Supporting skills included study and technology skills. Prater suggested that student comfort levels for use with technology need to be developed early to ensure student familiarity and confidence with the technology used.

Using the national and state standards discussed by Prater (2017) and Hess (2015), and the relationships, workplace, and knowledge skills outlined by the American Institutes for Research (2016), a suggested framework is outlined below. This UDL framework addresses research, communication, and technology skills to include and accommodate students with physical disabilities in the general education curriculum.

Developing Research Skills

Ability to conduct research is students need to develop in order to become employable. Practical communication skills including oral speaking skills, listening to others, and written communication must be developed by students in order to communicate about their research (American Institutes for Research, 2016). At the secondary level, national and state standards and guidelines address student research and technology skills (Hess, 2015). These standards and guidelines involve knowing how to locate and navigate online library websites, and require the student to use technology.

Students must determine the necessary keywords and enter those keywords and descriptors on their topic of research that will yield the results they are seeking. Students with physical disabilities often find this process formidable and give up easily because they do not possess the prerequisite background knowledge necessary to access and navigate online library websites to yield research on their topics. Ability to read and comprehend scholarly literature along with ability to narrow the information is necessary to answer specific research questions (Hess, 2015; American Institutes for Research, 2016). A study by Marino, Israel, Beecher, and Basham, (2013) indicated that, when given a choice, students indicated a preference for virtual learning over traditional methods of classroom instruction. For students at risk for failure, technology canbe used to help to prevent student failure and to enhance student accessibility to academic content. Speech recognition technology is helpful for nonverbal students who need it to communicate or to access instructional materials and content. Using technology to locate and narrow information, the relevance of learning experiences can be personalized for students and parallel future career-related expectations.

The online environment may pose several difficulties for students according to Odle(2004). First, knowledge of how to locate and navigate a library's online website is required. Rather than conduct a full literature search on their topic, students seek out search engines, such as Google, to research their topic or rely on Wikipedia. Second, students may not have immediate access to the general or special education teacher to answer their questions or to guide their literature searches, resulting in additional confusion and frustration for students. Third, the stress of locating research literature may detract the student from the purpose of the search, which is to locate articles on their topic, to read and evaluate whether the articles found answer their research questions, and to judge their findings as appropriate and valid research on their topic. These difficulties seem even more insurmountable for students with disabilities.

In order to alleviate these difficulties and develop skill in comprehending research, it may be necessary for the general or special education teacher to preselect the research literature used in student research for the student with disabilities. Preselecting research literature will remove the additional pressure placed on the student in locating and selecting appropriate research for their discussions. Breaking this process into stages may help the student to develop a clearer understanding of the research process. To get students started in the process, teachers may use a backward chaining technique by conducting literature searches and providing a link to the articles they wish students to utilize. The student can then focus solely on developing the comprehension skills necessary to interpret the literature. Odle (2004) suggested using a task analysis approach to student research. If the objective is for the students to first possess a broad understanding and later be able to narrow their topic to answer specific questions, the teacher may wish to provide preselected research articles to the student. To do an adequate job of investigating their topic, students must possess a clear and broad understanding of their topic in order to narrow and focus on a few questions they wish to present and answer. This may be necessary when comprehension skills are necessary to read and to understand research literature provided.

Rubrics are another technique for students to help guide and allow them to self-assess their online research strategy. Rubrics can give students ideas to outline and guide their research and help them to assess whether they have used effective and efficient techniques to brainstorm, list, outline, surf the web, or create a concept map to roughly draft their ideas (Odle, 2004). During the research process, students identify a variety of resources from the library databases; they must decide which credible online sources from experts are. Information comes from a variety of sources. Students are expected to evaluate the reliability of their sources and differentiate between primary and secondary information, facts and opinions, and various points of view. These are important research goals for students to develop. To assess student understanding of research, the general or special education teacher may develop a presentation rubric to evaluate the student's ability to examine a topic from multiple perspectives, and evaluate the reasoning, assumptions, and evidence supporting each perspective. The general or special education teacher must help the student with disabilities to present relevant, accurate information and concepts focused on the research topic (Boyle, 1996).

Developing Communication Skills

Students with disabilities have difficulty communicating their thoughts. According to Markus (2012), discussion stimulates critical thinking and social interaction. Student presentations also provide opportunities for students to apply course materials and demonstrate their own learning as they develop skill in communication (Paulson & Faust, 2015). According to Springer, (2005) research on the adolescent brain indicates that adolescents have an intense desire to express themselves through group interaction and discussion activities in order to engage in learning.

Preparing for discussion activities, such as panel discussions or small group discussions, helps students work individually to prepare their own presentation while working cooperatively within group parameters. Students have a chance to improve in their ability to conduct searches on topics of interest, organize ideas, and present their findings in a clear and concise manner (Hirsch, 2015). Students with disabilities benefit and find motivation from working with other students (Sandoval, Bryan, & Burstein, 2002). According to Hirsch, discussion groups encourage students to work collaboratively to research topics of timely interest, read and interpret research literature for the main idea, plan a presentation with group members, and actively participate in their group's discussion. Choice of topic and preparedness to work cooperatively with other group members is key to the success of student discussions. Students with disabilities work with nondisabled peers to build relationships where they are committed to a common project and group success (Mandernach, 2014). Kuntz, McLaughlin, and Howard (2001) studied the effects of cooperative learning for students with mild disabilities in the math classroom. In their study, they found that the math performance of students with disabilities in their study increased when cooperative learning was used as a classroom activity as an alternative to individualized instruction. This increased performance should carry over to the English language arts curriculum also. Kuntz, McLaughlin, and Howard inferred that the student-to-student interaction required for cooperative learning helped the student with disabilities to develop peer relationships and social skills within the group process in addition to math skills.

Structured discussion activities in which students actively thinks and share ideas serves to maintain student attention and result in more active class participation (Voniz, 2015; Kuntz, McLaughlin, and Howard, 2001). Oral presentations, including panel discussions or student discussion groups are popular means for assessing student understanding of research literature (Kagesten & Engelbrecht, 2007). Group presentations where students explain current research literature can be used encourage students with disabilities to read and understand research literature. Group and panel discussions are popular ways for students to demonstrate understanding of material (Hill, 2012). Student collaboration is encouraged and students find research easier to assess. For students with more severe physical disabilities participating in an online class environment, it is more difficult to encourage active thinking and understanding of research since the student may not be in the general education classroom with peers due to physical or health barriers that make them totally dependent. Small group research projects followed by group panel discussions help students with severe physical disabilities to participate from different sites and collaborate with peers to discuss and understand their research.

In preparing for a group or panel discussion, the teacher or instructor must carefully create groups and topics of interest for student research activities (Gonzolez, 2015). Group presentations are handy as assessment strategies for assessing student learning (Kagesten & Engelbrecht, 2007).

Group presentations provide students the opportunity to participate in active learning experiences. Working with disabled and nondisabled group members contributes to student collaboration and learning. Engaging students in research and group interaction builds their academic prowess (Mandernach, 2014). Active student involvement leads students to a feeling of ownership for their learning and to develop deeper understanding of research (Kagesten & Engelbrecht, 2007).

Students with disabilities may have problems in selecting their own topics and research literature. Preselected articles and topics for initial panels may be the easiest way to help students focus on the discussion panel process and their roles within the process when first implementing discussion as a teaching strategy. Several additional weeks of preparation may be necessary if students are going to select their own topics and conduct their own literature searches. When the teacher or instructor preselects topics and articles in advance of the discussion, students may be able to develop discussions within a few minutes or days (Paulson & Faust, 2015, Weinman, 2005). Students should work together to prepare for more questions and responses than they will use during the discussion. Preselected topics and articles will help the group members to focus less on finding research and discourage them from asking or responding to the same questions.

Guidelines for student discussion should be taught. The research on student discussion suggests that students should be grouped in panels or groups of four to five student participants in order to allow all members sufficient time to speak (Kirsner, 2015; Mandernach, 2014). A student moderator should guide the conversation and keep the discussion going at a smooth rate. The student moderator should monitor the time and serve as timekeeper for the group. Johnson (2008) suggests limiting each student to 15 minutes' presentation time and to less than three minutes for responses to audience or group questions. Group members and the moderator should maintain communication, meeting at least 2-3 times to practice their discussion so all will know what to expect (Mandernach, 2013). Students should be seated in a semi-circle with the moderator in the center (Johnson, 2008).

Developing Technology Skills

Technology (e.g., computers, tablets, phones) has may purposes and can be used to support the academic learning and engagement of the student with disabilities and will help them to research, write, participate, communicate, and socialize with general education peers in research activities (Israel, Marino, Delisio, & Serianni, 2014; Browder, Mims, Spooner, Ahlgrim-Delzell, & Lee, 2008; Hess, 2015). Active collaboration inside the classroom helps students develop collaborative, social skills, time management, presentation skills, and shared understanding of research (Kagesten & Engelbrecht, 2007). Simply handing the student with disabilities a piece of assistive technology will not eliminate barriers or insure understanding of research. Browder, Mims, Spooner, Ahlgrim-Delzell, and Lee (2008) suggest making sure the student with disabilities possesses the prerequisite understanding and skills necessary for using the technology designed and intended to assist him or her.

Technology can support student learning when teachers plan in advance, provide direct instruction for locating, analyzing, and organizing research materials, and modify activities, materials, and response modes to insure the participation of students with physical disabilities (Hess, 2015; Israel, Marino, Delisio, and Serianni, 2014). Technology can help teachers to remove or reduce barriers to communication and provide access to instructional materials for all students. According to Israel, Marino, Delisio, and Serianni, technology can be used to assist the student with disabilities in communicating with the teacher and classmates, to reinforce classroom instruction, for research activities, and for videotaping their group discussion.

Technology has also served as a resource for students to develop socialization and communication skills. For the student who can't physically participate in the general education classroom with peers, video conferencing may be used in all phases of the research process. First, group members may use video via technology to communicate, making it easier for students from different locations and schoolsvia distance learning to collaborate and participate. Second, students may use equipment to videotape and publish their discussions for viewing by others. Communication with fellow group members is vital during the planning stages, to practice individual presentations, and to receive feedback from fellow panelists (Mandernach, 2013).

There are many physical disabilities and conditions can impair a student's mobility and movement. The inability to change posture, move their arms effectively, have muscle weakness or tightness, or have involuntary muscles spasms because of paralysis, stiffness, pain, or other impairments affects a student's participation in many classroom activities. Students with mobility and movement impairments may find it difficult to participate in group activities due to physical barriers.

They have a desire to contribute to the fullest level of their ability, but some are totally dependent and require full-time assistance, while others can participate with part-time assistance. These students may require equipment to help with talking or communication. This equipment can include computer and electronic technology designed to assist with communication. If students are using technology to communicate or videotaping for later viewing, the teacher or instructor will need to make sure the students have knowledge of how to set up and operate video equipment, provide appropriate lighting of the student, quality sound devices to capture audio, and possess skill in how to edit video (Michels & Chang, 2011). The camera should be set up to clearly view the group member or members. If zooming in on individual speakers is desired, someone will be needed to operate the video camera. Wireless microphones may also be necessary to capture sound.

Conclusions

Opportunities that allow students to develop skill in conducting research and allow for application of their research in class promote scholarly activity. A variety of strategies and techniques are available to supplement classroom lecture. Students benefit and find motivation from working with other students. Solving problems together encourages their focus on finding solutions rather than on past failures. Discussion offers an opportunity for active participation, which is much more meaningful for students than passive listening to the teacher or instructor lecture in class. Individual students within the group develop knowledge of an issue or topic and present the information and their own views of the topic.

Using discussion as a means to understand research literature allows the teacher or instructor to move from an active teaching role to take a more passive role as facilitator to encourage student effort. Lecture is no longer the only means for sharing information. Research and discussion of research results are methods to communicate findings and develop a deeper understand of research. Online research on a topic allows students to navigate library databases and yield better research results. Students who are more willing to take risks in their choice of research to piscine better able to navigate different library databases. This strategy supports the classroom environment and strengthens student understanding. Working together, students develop a deeper and shared understanding of their research. They develop ability to work with others as part of a team, strengthen communication skills, presentation skills and understanding of research literature.

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