Student-Centered Learning: Instructional Strategies That Work

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Abstract

Student-Centered Learning creates a positive environment that is conducive to students being able to explore and discover the skills and concepts that they are learning. It encourages students to be creative and allows them to become active participants in their learning as they seek to find solutions to problems that they are presented with. The demands of the Common Core Standards have increased the rigor in the classroom, and they are requiring students recognize the relationships between what they learn in the classroom and applying it real life situations. Instructional strategies should be presented in a way that all students see that multiple subjects can be intertwined in their learning that defines a Constructivist classroom. Teachers that teach by actively engaging their students by allowing them to learn in a student-centered environment actively engage them in their learning process which in turn, motivates them to embrace learning no matter what material is presented to them.

Key Words: instructional strategies, common core standards, inquiry-based learning, constructivism, integrated learning experiences
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Watching a child, actively engaged in the learning process, discover a new concept or explore a new skill often awakens the desire to teach in future educators. Later, as trained professionals, selecting instructional strategies that actually motivate students to want to learn is a rewarding experience for a teacher. Teachers who embrace a constructivist classroom are often rewarded with such an experience as the learning environment is student-centered and supports real life experiences in the lives or the futures of the students. As a student-centered environment, instructional strategies that encourage students to reflect on their personal experiences to answer or originate solutions to the problems posed by the instruction are essential.

The Need for Instructional Strategies that Work

As they choose a mixture of indirect and direct instructional strategies, teachers create a differentiated learning environment that defines a constructivist classroom. In this environment, students become active participants in their learning. This frees students to derive answers or seek solutions in a variety of ways. Doing so brings about a sense of self-accomplishment and encourages a positive self-concept.

Instructional strategies are the means of structuring classroom events to ensure that student become and remain active participants. Thompson, Licklider, and Jungst (2003) identified the outcomes of carefully-selected instructional strategies as:

1. Contributing to the breadth and depth of content knowledge
2. Assisting students in learning how to organize knowledge around major concepts and principles
3. Enhancing student retention and retrieval
4. Contributing to the development of metacognitive abilities (p. 133)

If all that teachers had to be concerned about was selecting instructional strategies that ensured student-centered learning, it would seem that society would be satisfied. Yet, in a world where information increases as fast as technology can present it, society demands that students perform at their highest potential throughout all of their years of learning. These demands are most obvious through the rigor of the Common Core Standards, which require teachers to ensure that their students master information, digest concepts, gains skills, and become aware of real-life experiences to a particular (high) level during each year of their schooling. The Common Core Standards encourage teachers to apply each fact, skill, and concept to real-world situations to make learning relevant to students. In turn, it is important that students understand skills conceptually in order to be able to apply them to real-world experiences as learning must both come to and come from the student. This conceptual change occurs when students gain an understanding of how the facts, concepts, and skills they own are structured within the conceptual framework (Jonassen, 2006, p.185).
Theme-Based Learning

Selected instructional strategies should offer opportunities to students that allow them to demonstrate their learning at the highest level they can at the time. Teachers note these levels and adjust the instructional strategies so that they continue to challenge students to even higher levels of cognition and application. The difficulty with the Common Core Standards, in particular, goes beyond being able to select effective instructional strategies to ensuring that all standards are presented and mastered as set forth in the standards for the given school year. Although the standards themselves are fairly traditional educational standards, the presentation of the standards often require teachers to think outside the box when determining effective instructional standards that ensure a student-centered environment.

The Common Core Standards do offer teachers the opportunity to utilize theme-based lessons. Theme-based lessons allow students many vantage points when addressing the problem being presented opening up the number of options from which students can choose. For example, if a student is working with various concepts in simple addition and subtraction, an instructional strategy that would provide a real-life experience is to focus the student on sorting, classifying, and categorize items on that receipt. By having the student sum the prices of the items in each category, create word problems based on the categories discovered, and share the results with others, the student has practiced several concepts and skills, some of which may be new to the students. The idea of shopping and the use of receipts can be expanded from one student to a group of students by setting up a mock supermarket in the classroom and allowing students to buy, return, and restock items. Certainly, addition and subtraction facts and concepts were learned and reinforced, but additionally, skills in automatic facts, knowledge of how a supermarket functions, as well as specific vocabulary associated with a supermarket was also presented, experienced, and integrated by the students.

The instructional strategy that immerses the student in a particular environment can go far beyond the supermarket. It could teach world history through an Olympics theme or grammar rules through a quick trip around South America with its various Spanish-speaking countries. Instructional strategies, chosen wisely, enhance the educational process of students while offering teachers a creative outlet.

Inquiry-Based Learning

What is inquiry? Most would answer that it is the process of questioning, asking, or interrogating. The National Commission on Science Education Standards and Assessment (1992) answers that “inquiry is the process by which scientists pose questions about the natural world and seek answers and deeper understanding, rather than knowing by authority or other processes.” Understanding that inquiry is a scientific process, the use of inquiry-based instruction is another instructional strategy that offers effective student-centered learning. The inquiry-based science lesson, for example, might open a lively discussion in the classroom when focused on the question, “Which sense is the most important”? Questions that students may offer might include “What animal are we talking about?” or “What situation am I in?” These offer the teacher many creative opportunities to bring relevant real-world situations into
the classroom based on the geographical location of the town or an emerging weather pattern. The teacher could offer scenarios that present safety concerns such as crossing railroad tracks or even holiday events through decorations, smells of cooking pies, or usual temperatures.

Occasionally, teachers will dismiss the inquiry-based approach stating that answering questions through the asking of more questions is a method that takes too much time. Yet, while the approach does not need to dominate the instructional strategy choices, inquiry is a major component of scientific literacy. As such, students should be exposed to it and become proficient in its application to real-life problems. Doing so ensures that students practice the skills of science: observing, inferring, predicting, measuring, and experimenting (Bell, Maeng, & Peters, 2010).

Inquiry-based learning does not require that the teacher spearhead the questions. Once students gain skill in asking and answering questions, the students may suggest their own questions and design experiments to answer those questions. However, you choose to define inquiry, each definition will state or imply that it is an action of discovery by posing a problem or presenting a fact that requires further information in order to be accepted or rejected.

Science as inquiry is one of the content standards set forth in the National Science Education Standards (NSES, 1996). It is a basic in curriculum organization and therefore, inquiry-based instruction should be a mainstay in the science education that students experience. While, this standard highlights the student’s ability to do inquiry and to understand the fundamental concepts about scientific inquiry, the emphasis on inquiry moves beyond just the processes of science to work within and across disciplines and grade levels to increase its benefits on student learning (Trowbridge, Bybee, & Powell, 2004). Inquiry emphasizes student cognitive development based on critical thinking and scientific reasoning required in the use of evidence and information necessary to construct scientific explanations (Trowbridge, et al., 2004, p.62).

Inquiry-based teaching finds it roots in the findings of John Dewey. It was Dewey (1944) who noted that developing thinking and reasoning, formulating habits of the mind, and understanding the scientific process were objectives of teaching through inquiry. Using a “hands-on” approach to science, inquiry-based instructional strategies were promoted in the 1960’s with the goal of engaging students not only in scientific concepts, but also skills that were process-oriented and applicable to situations beyond science. (Demir & Abell,2010; Rutherford, 1964; Schwab, 1962).

Inquiry methods seem to increase higher level thinking, cause a shift from extrinsic to intrinsic rewards, help students learn how to investigate, increase knowledge retention, make instruction student-centered, thereby contributing to a person’s self-concept; increase expectancy level; develops multiple, not just academic talents; and allow more time for students to assimilate and accommodate information (Trowbridge, et al., 2004).

There are definitely two aspects of inquiry: one is the students’ learning, their attitudes, and their abilities; the other is teaching approaches and learning strategies. Therefore, inquiry instruction can be defined as an active process in which students answer a research question
through data analysis. Teachers should be able to scaffold inquiry instruction for the students to help them develop inquiry abilities. By varying the amount of information given to students, teachers can scaffold inquiry activities and model the process of scientific inquiry (Bell, et al., 2010; Bell, Smetana, & Binns, 2005).

Inquiry-based teaching is a teaching method which combines the curiosity of the students and the scientific method while developing the critical thinking skills of science. Students usually engage in five activities when participating in inquiry practices. The students usually question, investigate, use evidence to describe, explain, and predict, connect evidence to knowledge, and share findings (Warner & Myers, 2011).

Successful implementation of inquiry-based learning requires that lessons, when developed, encourage students to collaborate with one another, gain a new or deeper understanding of why something is the way it is, and use this understanding effectively to communicate with others about their findings (NRC, 1996). This approach differs from the traditional classroom where individual learning is prized, even demanded and tested. Although both classrooms would embrace the scientific method during the learning process, the traditional approach differs in that it offers students a lab with sequenced steps, basic questions, and predetermined conclusions. The traditional approach makes no allowances for the student’s prior learning or for the individual thought processes encouraged by the opportunity to inquire freely. In contrast, students are encouraged to protect their findings from their peers, to share ideas of ways to improve the investigation only if asked, and to communicate with other students during the learning experience only when allowed by the teacher—if they are allowed to talk at all.

To be successful with inquiry-based learning, teachers must have an in-depth knowledge and understanding of the topic being presented. They should have the pedagogical tools to support the students in their thought processes while stimulating their interests in learning more than they already do (Chiappetta & Koballa, 2010). Just as scientists do, students should have the opportunity to share as they learn, and the teachers should be able to facilitate a forum that encourages talk and arguments among the students. Having a strong background in the topic is essential. Without in-depth, critical knowledge about a topic, the teacher is not going to be effective in leading a collaborative discussion which encourages students to evaluate or synthesize what is being presented by their classmates. For example, students may need to clarify what they have stated or incorporate visual models for a better understanding of their position. The teacher should be able to identify that need and facilitate this interaction.

Because the inquiry-based approach to learning deviates from the traditional classroom approach, teachers must motivate students to learn by inquiring rather than being told by the teacher. In order to motivate students in this learning approach, teachers need to create a rapport with the students. Teachers need to reassure students that there is a support system behind the approach that will not leave the student floundering around, but will offer guidance and structure when required by the student. It is the responsibility of the teacher to ensure that students have a warm, welcoming learning environment that encourages student learning instead of “student floundering”. This is a critical factor to ensuring individual success in the learning of each student.
For students that need enrichment or remediation, inquiry-based learning supports all of the multiple intelligences. Inquiry-based learning encourages students to use their preferred learning style allowing them to learn in ways that are comfortable for them the way. This increases successful learning by these students because it reduces stress on the student during the learning process.

Inquiry-based learning is supported by both short- and long-term goals, just as any learning should. The experiences of inquiry-based learning support all learners regardless of their educational background or capabilities. The teacher is challenged by inquiry-based learning to create an environment and an experience that ensures all students will gain additional knowledge, apply that knowledge, and evaluate that knowledge culminating in the ability of the students to apply their new knowledge to real life experiences. Inquiry-based learning is a proven approach that teachers can use successfully to develop students interested in answering their own questions and owning their own knowledge.

**Constructivism in the Classroom**

A Constructivist classroom allows students to learn in a student-centered environment. The teacher plans lessons in ways that provide students several learning activities through which the lesson can be completed. Differentiating instruction in this manner allows students to be creative in their approach, but yet encompass lesson components that lead them to think at higher levels. Students are able to learn from one another, share with their classmates, and even create or solve problems together creating an inductive environment that promotes life-long learning. “Constructivism promotes an open-ended learning environment where students work to construct their knowledge through their own experiences and schema” (Sternberger, 2012, p.121). Teachers who foster a constructivist classroom environment cultivate the ability of the students to develop a conceptual understanding of the concepts by promoting a meaningful way for students to gain knowledge and the motivation to learn more. This pedagogical model inspires students to think creatively and boosts their enthusiasm to dig deeper into the conceptual understanding of the problem using questions like “how” and “why”. This, in turn, spurs their interest and serves as the driving force behind inquiry based learning defining why teaching using interdisciplinary instruction is so valuable.

Preparing students to conceptualize skills and objectives can be challenging for new teachers. Being able to integrate lessons so that students can see the relevance of a skill or concept across the curriculum is a task that keeps teachers searching for new ideas to present instructional material. Interdisciplinary instruction allows students to relate their prior knowledge and experiences to what they are learning in school. It supports their learning because it ties in the emphasis of understanding through inquiry with connections throughout their subjects. “Education is forever in a state of flux, and the curricular changes taking place today are not new” (Fillipino, Ross, & Skinner, 2005. p.228).

**Teaching Across the Curriculum- An Interdisciplinary Approach**

While teaching across the curriculum is not new, instructional strategies such as inquiry-based learning or problem-based learning allows teachers to enhance their instruction by the
integration of these strategies. Learning by discovery and exploration, as well as, integrating instructional technology in the classroom gives the students options to present what they have learned in a different way. It allows students to tie in a concept or skill to language arts, mathematics, science, social studies, along with the performing arts such as drama and music. In a project on Native American Trade Routes, the strategy would be as follows:

**Opener:** What does “culture” mean? How do we apply that to the Native American Indians?

**Motivation:** The students will collaborate in pairs or groups on how the Native Americans obtained their resources.

**Activity for Social Studies:** The teacher sets up “Trade Route” in the classroom. The “Trade Route” is designed to teach students about culture, bartering, and how both impact modern-day life. The teacher would need to set up the project to include the route for students to understand the cultural traditions and values that influenced trading. The goal of this lesson would be for the students to discover the definition and logistics of bartering, and why it was so important for survival of the Native Americans. The students would have to barter or trade for basic needs, land, and water supply. They will have to explore the cultural groups that they might encounter, the physical features of the land that surrounds them, as well as the type of economy that the Native Americans had constructed.

**Connections to Science, Mathematics, and Language Arts.**

Students would discover that bartering is exchanging goods for other goods. Students would be required write about the culture of Native American Indians and what they had to do in order to survive. Collaboratively, students would determine their definition of bartering and how that influenced the way that we negotiate today. “Personal relevancy of the students is important in the sense that it concerns with the connectedness of school experiences to students’ out-of-school experiences, and on making use of students’ everyday experiences as a meaningful context for the development of students’ knowledge” (Koo, Sultan, & Woods, 2011, p. 149). In Mathematics, students would solve word problems that allowed them to discover the costs of basic needs and land so that they would know how much monetary value was on each item being bartered for. In Science, students would explore what resources were available on certain lands, and what crops could be grown on that land.

**Connections to Performing Arts and Technology.**

The students would perform a skit or sing a song that showed their depth of knowledge about the Native American culture and how they survived. They would use what they have learned in this activity, as well as engage in research for additional information in order to present it to their classmates. Encouraging students to incorporate the Arts in their learning also allows the creative students to be a part of the presentation process. Students can also be given the option to use an Interactive White Board for the presentation. They can create a virtual tour.
of the “Trade Route” that shows the landmarks, water resources, cultural groups they encountered, and items they used to barter in the presentation.

**Problem-Based Learning**

Another approach to teaching is the design-based or project-based immersion units referred to as full inquiry units or Project-Based Science (PBS). Those units are usually weeks long and provide students with one overarching problem. Most of the projects have learning goals in areas including communication about scientific explanations or arguments allowing students to develop scientific reasoning. Design-based curriculum like PBS evolved out of an engineering model of teaching and learning and has a strong focus on applying concepts to solve real-world problems (Buxton & Provenzo, 2007).

The distinction between problem-based learning and other forms of active learning often are confusing because they share certain common features and approaches. However, an essential component of problem-based learning is that content is introduced in the context of complex real-world problems. In other words, *the problem comes first* (Boud, 1985; Boud & Feletti, 1991). This contrasts with prevalent teaching strategies where the concepts, presented in a lecture format, precede “end-of-the-chapter” problems. In problem-based learning, students working in small groups must identify what they know, and more importantly, what they do not know and must learn (learning issues) to solve a problem. These are prerequisites for understanding the problem and making decisions required by the problem.

“Naturally, drawing from different content areas they exemplify interdisciplinary instruction” (Verkler, 2003, p. 323) Teachers that employ interdisciplinary instructional strategies construct problems that exemplify the demands that our students are experiencing today. Creating a positive, student-centered, holistic environment is essential for all students to embrace learning (Stephen, Taitt, & Varble, 1993, p. 116). Giving students options allows them to explore and discover in their learning style. It gives them the empowerment and ownership of their learning, and allows them to control what learning they are experiencing. Collaboration with their peers gives them the ability to dig deeper into their understanding of the content and skills that directly impacts their achievement.

Allowing students to have options in their learning furthers their desire to want to learn more. For example, if a student is given an assignment that is in their learning style, they are more likely to put forth more effort into the assignment. A teacher can create the assignment to deepen their understanding of a skill, and at the same time have them evaluate and synthesize that information at a higher level. Many times if students are struggling, presenting the material in their learning style enables them to grasp the material with greater ease. “With a cross-curriculum emphasis, these core curriculum standards staircase growing text complexity, and increased use of technology for sharing information and concepts, and a content-rich curriculum which assures smoother grade-to-grade progression” (Hill, 2011, 42-46). Inquiry based learning allows students to learn by discovering and exploring, and it teaches students to answer the “how” and “why” questions posed by the problems. Being able to explain, evaluate, and analyze why something takes place or how something works permits students to demonstrate their knowledge and their depth of knowledge.
Summary

Whatever creative application a teacher may choose, implementing interdisciplinary opportunities for problem-based learning through inquiry-based instruction is an instructional strategy that works for many of the Common Core Standards. The application of this strategy offers creative opportunities to the teacher resulting in diverse, perhaps, even entertaining learning experiences for students. Creating such a learning environment prepares students for success in both life and future education endeavors, and this should be the goal of all teaching efforts.

References


