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Science education in lower classes: Scope of science teaching in modern era to new opportunities and solution

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Abstract

The objectives of science teaching are to build up scientific precision, scientific attitudes and science process skills like measurement, observation and so on. Science is one of the human activities that man has created to gratify certain human needs and desires. The definition of a scientific conclusion in science is the summary of the results of an experiment that is usually shared with peers or the general public. It is important to separate this from a scientific theory, which is a data-driven explanation, usually of the natural world. teachers need to develop understanding of the theories of knowledge (epistemologies) that guide the subject-matter disciplines in which they work. Contemporary science teaching approaches focus on fostering students to construct new scientific knowledge as a process of inquiry rather than having them act as passive learners memorizing stated scientific facts. Science education aims to increase people's understanding of science and the construction of knowledge as well as to promote scientific literacy and responsible citizenship. A conclusion paragraph contains a description of the purpose of the experiment, a discussion of your major findings, an explanation of your findings, and recommendations for further study. Goals are as a teacher, how met them in the past and how intend to build on them in the future. Personal approach to teaching and managing the classroom, and include what believe makes unique. Science education gives students the opportunity to gain a better knowledge of how and why things function. Science can teach children about the world that surrounds them. Everything from human anatomy to techniques of transportation, science can reveal the mechanisms and the reasons for complicated systems. Scientific knowledge allows us to develop new technologies, solve practical problems, and make informed decisions both individually and collectively. Because its products are so useful, the process of science is intertwined with those applications: New scientific knowledge may lead to new applications.

Keywords: Science teaching; teaching Perception; accountability in teaching

1. Introduction

The Capability to speak and communicate instantaneously is the reason for the existence and all the progress we see today. Everybody`s life ends after transferring the most of the knowledge he has received in life to others. This rule applicable to teachers and students, teachers and learners are teachers are learners in the situation they live in. But teachers teach sum of research done on specific topic. The teacher has superiority and should keep it in front of the students but this should not detract from the learning from the problems arising from the situations or doubts of the students[1].

Students motivate their teachers through the responses they create and enact to the teacher's plans and transfer of knowledge. Common teaching skills are subject knowledge, instructional methods, assessment, problem solving, equity, and professionalism. Teachers are examples of how learning works. We investigate, explore, examine, process, consider and reflect. We nurture the skills, traits and knowledge of our teachers as much as we do from our students.

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A person who seeks to acquire knowledge or skill by learning, practicing, or teaching will be a better teacher. A science teacher need high-ability demonstrates an intense level of curiosity in science [2]. Demonstrates a broad knowledge base in science and relates that knowledge base to new problems and topics. Science curriculum helps learn science, develops knowledge, problem solving skills, enhances critical thinking, fosters passion for learning, elevates many disciplines and holds the key to future and technology. Science makes a lot of communication with other people and develops patience and perseverance in children [3].

2. Material and methods

2.1. Methods of measuring level of students

Modern science is important because it facilitates the process of learning, understanding, synthesizing, revising, and repeating the process for a better understanding of the world around us. It is necessary to solve extent in scientific knowledge based on and/observed from natural world, extent of scientific knowledge comes through cultural exchange and common communication, sense of scientific knowledge invented in growth of a person. In work aim to identifying and analyzing the various problems and giving solutions based on the reported papers. In the present, level of student measures may include homework, quizzes, exams, reports, essays, research projects, case study analysis, and rubrics for oral and other performances. Intelligence, cognitive styles and personality are individual characteristic that play important role in teaching and learning. Other variables such as motivational orientation, self-esteem and learning approaches are important factors that affect teaching and learning [4]. The five standards for this work are: (a) Joint productive activity: teacher and students producing together; (b) language development: developing language and literacy across the curriculum; (c) contextualisation: making meaning: connecting school to students' lives; (d) challenging activities: teaching complex thinking; and (e) instructional conversation: teaching through conversation. Four aspects of teacher performance are also considered in this work: professional integrity or values, skills and competencies, diligence, and their own and their students' achievement [5].

2.2. Methods of measuring accountability

Standards ensure better accountability – holding teachers and schools responsible for what goes on in the classrooms. The practice of aligning learning to standards also helps ensure that a higher level of learning is attained, guides teachers in the process of assessment and helps keep them on track. The point of a standard is to provide a reliable basis for people to share the same expectations about a product or service. This helps to: facilitate trade, provide a framework for achieving economies, efficiencies and interoperability. Work aims what students are expected to know and be able to do at a specific stage of their education [6].

I distinguish between three types of standards: content standards, process standards, value standards. It is necessary to define accurately discern their learners' strengths and needs and are proactive in differentiating and employing a range of effective intervention strategies to secure progression for individuals and groups. Make the standards fit into student interests. “My job as a classroom teacher is to find how the standards fit what the kids want to learn,” said educator Michelle Baldwin. “I could present patterns in ten thousand different ways, but it’s not going to grab them unless they decide.” Using students' interests as the guide would prevent standardization by tapping into the unique qualities of each student.

2.3. Methods of measuring perception levels

The following ways of teaching and students perception levels are analyzed. Teach students to question, when kids develop effective questioning techniques they become active partners in constructing learning. They can shape and create meaning by questioning if educators encourage them to do so. Focus on the skills and language of learning, when students can talk about their own learning, they can begin to make connections themselves, broadening conversations beyond standards and moving towards authentic, individualized learning. Be open to many answers. When educators focus on discovering how students know what they know, and are open to that manifesting in multiple ways, it gives students the opportunity to bring creative demonstrations of learning to the table. Have authentic conversations about motivations. Many students have significant responsibilities outside of school that have made them skeptical about what school can do for them. Starting the year with a conversation about why they are motivated to learn helps educators get to know their students and can help dispel the feeling that school exists in an alternate reality from life [7].

Teachers play a role in implementing a good integrated science learning strategy is as a source of learning, learning facilitators, learning managers, demonstrators, instructors of learning, motivators, and evaluators in learning. An important competency that must be possessed by an educator to be able to carry out learning with a scientific approach is that educators master the varied learning strategies. The quality of teachers in teaching becomes an important factor

in the success of science learning. The teacher's role as a facilitator must be supported by the teacher's ability to plan learning, manage classes, and teacher creativity in presenting learning. Lack of student interest due to learning with lectures and no questions and answers. Teachers' teaching skills and student learning motivation correlate strongly with learning outcomes. Perceptual learning, process by which the ability of sensory systems to respond to stimuli is improved through experience. Perceptual learning occurs through sensory interaction with the environment as well as through practice in performing specific sensory tasks [8].

3. Results and discussion

3.1. Science teaching with active participation

There are different types of teaching methods that can be categorized into four broad types. They are teacher-centered methods, learner-centered methods, content-focused methods; and Interactive/participative methods. This is the best teaching method invented so far that involves the active participation of students to experience scientific concepts than to just have an audience view. Schools are promoting the use of low cost apparatus in classrooms to helps students to have hands on learning experience. System thinking and modeling to explain phenomena and to give a context for the ideas to be learned.

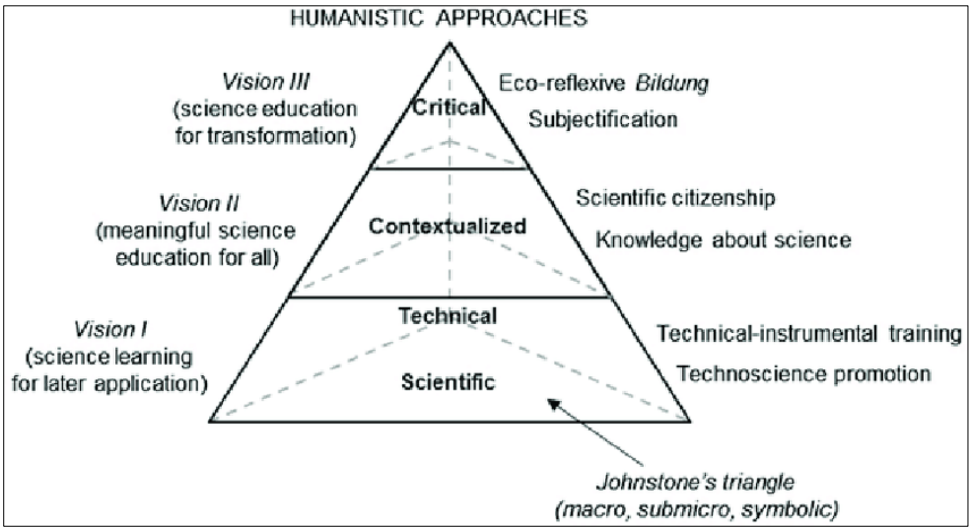

Figure 1 Humanistic Approaches

Science emphasizes both theory and experimentation. After learning the theoretical knowledge, experimental operation can help students understand chemical concepts and transform them into practical knowledge. For example, triangle model to represent the three levels of chemistry knowledge and he pointed out how to interrelate each new concept or fact in all three domains: (1) macroscopic and tangible subjects: providing observable chemical phenomena appear to the senses, color, smell, density, etc., (2) submicroscopic explanation: showing the invisible 3D world of atoms, molecules, ions and their dynamic motions, interactions, and kinetics, and (3) symbol representation: including formulae, equations, molarity, mathematical manipulation etc [9].

The major questions were whether teachers and students would demonstrate gains in attitudes about science as a result of this project. With respect to teachers: They gain confidence in their knowledge of and ability to (a) teach physics and chemistry, and (b) recognize and counteract gender inequity in the science classroom. They demonstrate (a) more positive attitudes towards science and science careers, (b) less science gender-stereotyping, (c) more positive concepts of their own science ability and achievement, and (d) increased on-task time during science class.

3.2. Science teaching keeping the accountability

Science education continues to iteratively move through reform efforts, from constructivism to direct instruction, and from local accountability to national standards. This study presents a systematic review of literature on the relationship of one reform effort, test-based accountability, to science instruction, from the viewpoint of practitioners. Although many studies have examined this connection empirically there has been no recent synthesis of these studies.

Test-based accountability policies frequently correlated with changes in instructional practice, the amount of science taught, and teacher satisfaction. Importantly, current test reporting requirements reveal gaps in achievement between subgroups of students and may result in the mobilization of greater resources, i.e., time, effort, and funding, to assist students not meeting performance standards. In the studies reviewed here, some teachers and administrators also positively discussed the alignment of curriculum and instruction with standards and assessments within their classes and throughout school systems[11].

3.3. Different perception level of students

Teachers identified three principal tensions which correspond to the three dimensions of culturally responsive teaching: (a) cultural and linguistic relevance versus standardization, (b) community of learners versus teacher transmission, and (c) social justice versus enhanced test scores. Perception of class structure can lead to positive emotions such as school satisfaction and academic self-efficacy, enjoyment of learning, academic buoyancy, and self-esteem as well as negative emotions. Perception means the action of perceiving. Perception is "awareness of something which related to previous knowledge". Through the perception process produce the meaningful experiences of the world which basis of the reality and attitude. The perception process consists of four steps: selection, organization, interpretation and negotiation. Perception is the quality of being aware of the conditions in one's environment. For example, visual perception refers to the ability of an organism to see objects in the world around it. Other forms of perception involve the senses of touch, smell, taste, and sound.

This includes visual perception, scent perception, touch perception, sound perception, and taste perception. We perceive our environment using each of these, often simultaneously. Perception is mainly influenced by biological factors like physiological factors such as sense, age, and neurobehavioral challenges and psychological factors such as mood and self-concept. There are some internal factors as well that influence perception. Those are personality, motivation and learning, and experience. How we perceive others can be improved by developing better listening and empathetic skills, becoming aware of stereotypes and prejudice, developing self-awareness through self-reflection, and engaging in perception checking. Perception is a source of knowledge because it is a source of justified true beliefs about the world around us. But the fact that perception is a source of knowledge doesn't mean that the concept of knowledge can't be fully elucidated without reference to the concept of perception [11].

Perception is the process of selecting, organizing, and interpreting information. This process affects our communication because we respond to stimuli differently, whether they are objects or persons, based on how we perceive them. Academic achievement was significantly related to higher scores for perception of teaching, perception of atmosphere and social self-perception. Activities in perceptual motor skills include, gross motor activities: throwing, catching, kicking, jumping, swinging. Fine motor activities: cutting, lacing, hammering, buttoning, pouring. Body awareness activities: naming, pointing, identifying, moving, and performing tasks using body parts. Students' perception is the process of preferential treatment of students toward information they get from an object, in this study is teachers' classroom questions. Through observations with their senses, students can interpret the observed object. Collecting accurate information is the intermediate function of some forms of perception, whereas guiding behaviors is the ultimate function of all perception.

3.4. Different strategies in science teaching

The six strategies for effective learning, as we call them on the Learning Scientists Blog, are spacing, retrieval practice, elaboration, interleaving, concrete examples, and dual coding. Integrated science is taught through inquiry-based learning approaches with an emphasis on the 5Es: engagement, exploration, explanation, elaboration and evaluation. Six strategies for effective learning are based on evidence-based research and the science of learning. Exploring spaced practice, retrieval practice, elaboration, concrete examples, dual coding and interleaving. Real-life scenarios, peer-to-peer teaching, hands-on activities, science projects and field research journals are effective teaching techniques in the science curricula. Integrated scientific process skills contains skills including formulating hypotheses, defining operationally, identifying, and controlling variables, experimenting, interpreting data, and making inferences The three categories include multidisciplinary integration, interdisciplinary integration and trans-disciplinary integration. Teachers who use this method focus primarily on the disciplines [12].

Integrated history and philosophy of science combines philosophical and historical approaches to identify the epistemically significant features of scientific activity and to trace their historical development. Problem solving method involves reflective thinking; logical reasoning, scientific inquiry and results from the achievement of certain abilities, skills and attitude, present evidence indicate that it needs a continuous training. method of a scientist'.

Some reason for failure perception level due to planning the lesson, poor class management and control, lack of facilities in practicing schools, flawed way of their teaching and ineffective usage of teaching aids. In a problem solving method, children learn by working on problems. This enables the students to learn new knowledge by facing the problems to be solved. The students are expected to observe, understand, analyze, interpret find solutions, and perform applications that lead to a holistic understanding of the concept.

4. Conclusion

Classroom observation is an essential part of teaching. It checks and adjusts a teachers performance meaning that students get the most out of their lessons, improving their academic performance and, thus improving the overall performance of the school. Goal of science education is to teach students to: Use and interpret science to explain the world around them. Evaluate and understand scientific theories and evidence. Investigate and generate scientific explanations. As the understanding of the various interactions grows, predictions can be made with greater confidence. Systems can then be harnessed in reproducible, reliable ways. The broad goals of science are to understand natural phenomena and to explain how they may be changing over time. Science is a way of knowing about the world. At once a process, a product, and an institution, science enables people to both engage in the construction of new knowledge as well as use information to achieve desired ends. Science explains the world because it is by way of scientific explanations that the chief cognitive aim of science is achieved. A good science education is key to productivity and success. Science is a cumulative and endless series of empirical observations which result in the formation of conc4epts and theories, with both concepts and theories being subject to modification in the light of further empirical observations. Science is both a body of knowledge and the process of acquiring it.

References

[1] Patricia A. D, The Discursive Co-construction of Knowledge, Identity, and Difference: An Ethnography of Communication in the High School Mainstream, Applied Linguistics, 2002; Dec; 23(3); 289–322,

[2] Deborah L. Michele H., Valarie L. Elementary teachers' pedagogical content knowledge for teaching the nature of science, Science Teacher Education, 2011; Jan; 95(1), 145-167.

[3] Linda D. H, Lisa F, Channa C. H, Brigid B, David O, Implications for educational practice of the science of learning and development, Applied Developmental Science, 2019; Feb; 24(2), 97-140.

[4] Jimerson S. Haddock A, Understanding the importance of teachers in facilitating student success: Contemporary science, practice, and policy, School Psychology Quarterly, 2015; March; 30(4), 488–493.

[5] Annela T, Investigation of instructional coaching for teachers of diverse learners, Urban Education, 2014, Jan; 49(5) 574–604.

[6] Arzberger P, Schroeder P, Beaulieu A, Bowker G, Promoting Access to Public Research Data for Scientific, Economic, and Social Development, 2004, 135(3), 135-152

[7] Christine C, Classroom Interaction in Science: Teacher questioning and feedback to students' response, 2006, Feb; 28(11) 1315-1346.

[8] Dorit M, The Teacher's Role in Developing Interaction and Reflection in an Online Learning Community, Educational Media International , 2003, 40(2), 127-138.

[9] Wernhuar T, Liang O, A Virtual Experiment for Learning the Principle of Daniell Cell Based on Augmented Reality, Applied Science, 2021, 11(2), 762-766.

[10] Shannon V, Nathaniel P, Leaving the teaching profession: The role of teacher stress and educational accountability policies on turnover intent, Teaching and Teacher Education, 2017, Aug; 66(3), 1-11.

[11] Mehmet A, Adnan B, The Mathematics Teacher's Beliefs about Mathematics Knowledge and Its Teaching: A Case Study, 2011, Jun; 2(1) 1 – 15.

[12] Ryan R, Layne D, Understanding Excellence: a Qualitative Analysis of High-Performing Learner Study Strategies, Medical Science Educator, 2021, March; 31(1), 1101–1108.