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Planning Science Lessons Using 5E Instructional Model

There are many theories in the educational process suggesting various methods of teaching sciences in English. This article reveals 5E Instructional Model is unique because it focuses on developing the learners' knowledge by subsequent teaching and consolidation of knowledge. The model consists of five stages (engagement, exploration, explanation, elaboration, and evaluation). The article contains the table, reviewing recommendations and examples of each stage of this model, that encourage thinking, understanding, exploration, problem solving, collaboration, analysis, observation and prediction.

Key words: School Education, Biology Teaching, Classroom Teaching, Classroom Activities, Engagement, Exploration, Explanation, Elaboration, and Evaluation.

According to the BSCS 5E Instructional Model, the key strategies to think about when planning a scientific lesson are: *engagement, exploration, explanation, elaboration, and evaluation* [1]. These 5 items, known as the «5 E's» are essential to engage children in scientific discourse. As we experienced in class, during the lesson revealing the theme «Magnetism», the 5 E's help students to first become excited about the lesson, then engage themselves in hands-on activities, create wonderings, test the wonderings further, and discuss the lesson at the end, allowing for sharing and assessment. The students will gain a lot of information and conclusions during the lesson as well as new wonderings, and this allows for the students to engage in scientific discourse from the intrinsic motivation the lesson gives [2].

Engagement

The first of the 5 E's, engagement, is the first step to introducing the lesson. Engagement involves activating students' prior knowledge about the subject of study. In order to activate prior knowledge, the teacher must hook the students in and make them become interested in the lesson. There are many ways to hook the students, but one great way is through a sort. This allows for a hands-on activity while helping the students to start thinking about what they already know with the items they are sorting. In class, the students were given a bag full of items and instructed to sort the items by whether it is magnetic or not. This allowed for each of them to use their prior knowledge and experiences with magnet in order to help sorting. Another great way to get the students interested in the lesson is by setting up an interesting situation in the classroom and allowing the students to observe and discuss the situation [3]. An example of this was shown in class when the teacher set of the magnet experiment and made the paper clip appear to float. All of students discussed what they thought might happen if an item passed through the magnetic field, and these predictions were based solely on prior knowledge.

Exploration

The next of the 5 E's, exploration, involves performing an experiment to help answer questions and provide further wonderings. While performing the experiment, the student scientists must collect evidence in order to back up any claims made about the experiment. Exploration allows the students to create and test their own experiments with given materials. This process allows for better understanding of the initial concept, and in turn, will help to improve the students' understanding for making claims. We experience exploration in class when each group was given a magnet in order to test the piles created from the previous sort.

Explanation

Explanation is one of the most critical components of the 5 E's model. This part of the lesson facilitates students' discourse and helps the students' focus on the goal of the lesson. From the exploration portion, students will have a few central claims about the topic, and explanation is the opportunity for the students to make these claims public. Once the claims are made public, other classmates can either prove or disprove claims through their own evidence collection. The students' transition from small group to whole group in-

struction, bringing materials and questions they have with them to the discussion. Explanation gives the teacher an opportunity to listen to the students' findings and guide the students towards the lesson's goal.

Elaboration

The fourth of the 5 E's is elaboration. Elaboration occurs when the teacher implements strategies to challenge the student's teaching. These strategies often include providing new experiences for the learners. These experiences should stem from the learner's wonderings and should supplement the instruction of the big idea. Elaboration builds on the knowledge and the discourse gained and gives the learner the opportunity to apply understanding to a new experience. Through the new experience a review of old concepts leads the learner to a discover of new knowledge. Our science class observed elaboration when students used their basic knowledge of magnets (from prior knowledge and from the sorting activity) to make a prediction about what objects will affect the magnetic field in the paper clip and magnet experiment [4–6].

Evaluation

Evaluation is the last of the 5 E's. The teacher must create a quality assessment to gauge the learner's understanding of the topic. The students must also be able to reflect on their own understanding and progress. Evaluations should be made before activities to assess prior knowledge, after activities to assess progress, and after the completion of units to assess comprehension [7]. We discussed some ways a teacher could evaluate the learner's during the magnet lesson. This included the teacher or peers review the records in the science notebooks. Also, what students know, what they learned, and what was our evidence components of the chart would give us a general assessment of the learner's as a group.

The 5 Es Instructional Model

Stage of the Instructional Model [8–11]	The Teacher. . .	The Student. . .
1	2	3
<p>ENGAGE Initiates the learning task. The activity should make connections between past and present learning experience, and anticipate activities and organize students' thinking toward the learning outcomes and current activities</p>	<ul style="list-style-type: none"> • Creates interest. • Generates curiosity. • Raises questions and problems. • Elicits responses that uncover students' current knowledge about the concept/topic. 	<ul style="list-style-type: none"> • Asks questions such as, «Why did this happen?» «What do I already know about this?» «What can I find out about this?» «How can this problem be solved?» • Shows interest in topic.
<p>EXPLORE Provide students with a common base of experiences within which current concepts, processes, and skills are identified and developed.</p>	<ul style="list-style-type: none"> • Encourages students to work together without direct instruction from the teacher. • Observes and listens to students as they interact. • Asks probing questions to redirect students' investigations when necessary. • Provides time for students to puzzle through problems. • Acts as a consultant for students. 	<ul style="list-style-type: none"> • Thinks creatively within the limits of the activity. • Tests predictions and hypotheses. • Forms new predictions and hypotheses. • Tries alternatives to solve a problem and discusses them with others. • Records observations and ideas. • Suspends judgment. • Tests ideas.
<p>EXPLAIN Focus student's attention on a particular aspect of their engagement and exploration experiences, and provide opportunities to demonstrate their conceptual understanding, process skills, or behaviors. This phase also provides opportunities for teachers to introduce a concept, process, or skill.</p>	<ul style="list-style-type: none"> • Encourages students to explain concepts and definitions in their own words. • Asks for justification (evidence) and clarification from students. • Formally provides definitions, explanations, and new vocabulary. • Uses students' previous experiences as the basis for explaining concepts. 	<ul style="list-style-type: none"> • Explains possible solutions or answers to other students. • Listens critically to other students' explanations. • Questions other students' explanations. • Listens to and tries to comprehend explanations offered by the teacher. • Refers to previous activities.

Table continued

1	2	3
<p>ELABORATE</p> <p>Challenge and extend students' conceptual understanding and skills. Through new experiences, the students develop deeper and broader understanding, more information, and adequate skills.</p>	<ul style="list-style-type: none"> • Expects students to use vocabulary, definitions and explanations provided previously in a new context. • Encourages students to apply the concepts and skills in new situations. • Reminds students of alternative explanations. • Refers students to alternative explanations. 	<ul style="list-style-type: none"> • Applies new labels, definitions, explanations, and skills in new, but similar, situations. • Uses previous information to ask questions, propose solutions, make decisions, and design experiments. • Draws reasonable conclusions from evidence. • Records observations and explanations.
<p>EVALUATE</p> <p>Encourage students to assess their understanding and abilities and provide opportunities for teachers to evaluate student progress.</p>	<ul style="list-style-type: none"> • Refers students to existing data and evidence and asks, «What do you already know?» «Why do you think . . . ?» • Observes students as they apply new concepts and skills. • Assesses students' knowledge and/or skills. • Looks for evidence that students have changed their thinking. • Allows students to assess their learning and group process skills. • Asks open-ended questions such as, «Why do you think . . . » «What evidence do you have?» «What do you know about the problem?» «How would you answer the question?» 	<ul style="list-style-type: none"> • Checks for understanding among peers. • Answers open-ended questions by using observations, evidence, and previously accepted explanations. • Demonstrates an understanding or knowledge of the concept or skill. • Evaluates his or her own progress and knowledge. • Asks related questions that would encourage future investigations.

Thus, in the classrooms of today, learners neither are no longer passive recipients nor are the teachers the all knowing '*givers of information, knowledge and wisdom*' [12]. According to 5E's perspective, the teaching or rather more precisely learning of sciences is not the search for the ultimate truth. It is the process which is of utmost importance in science than the content. So when the learning of biology involves active construction of knowledge by students, then the classroom environment must call for more synergies rather than mere individual participation. The teachers need to develop the ability to work with students creatively to generate new ideas, new theories, new products and new knowledge. The engagement of the learner in the construction of classroom activity requires inputs from a reflective teacher and meticulous pre-planning before a unit is transacted in the class. Strategy of 5E's of learning through group work, small work and whole class work are important, again depending on task and the teaching objective. Learner autonomy and respect for individual learners is mandatory if real learning is to take place. Encouraging learners to reflect and question their own understanding further aids comprehension should help to acquire the material properly.

References

- 1 Agnew P.W., Kellerman A S., Meyer J. Multimedia in the Classroom, Boston: Allyn and Bacon, 2006. — P. 127–146.
- 2 Boud D., Feletti G. The Challenge of Problem-Based Learning, (2nd Ed.), London: Kogan Page, 2009. — P. 93–102.
- 3 Hofstetter F.T. Multimedia Literacy, New York: McGraw-Hill, 2010. — P. 54–62.
- 4 Jonassen D., Peck K., Wilson B. (2009). Learning With Technology: A Constructivist Perspective, New Jersey: Merrill / Prentice Hall, 2009. — P. 164–178.
- 5 Lindstrom R. (2011). The Business Week Guide to Multimedia Presentations: Create Dynamic Presentations That Inspire New York: McGraw-Hill, 2011. — P. 27–39.
- 6 Tapscott D. Growing Up Digital: The Rise of the Net Generation, New York: McGraw-Hill, 2008. — P. 55–68.

- 7 Teo R., Wong A. Does Problem Based Learning Create A Better Student: A Reflection? Paper presented at the 2nd Asia Pacific Conference on Problem-Based Learning: Education Across Disciplines, December 4–7, Singapore, 2009. — P. 45–53.
- 8 Vaughan T. Multimedia: Making it Work (4th Ed.), Berkeley, CA: Osborne/McGraw-Hill, 2008. — P. 13–25.
- 9 BPP (2000), Success in your Research and Analysis Project.
- 10 [ER]. Access mode: http://www.cellbiol.eu/docs/Constructive_teachingKramer.pdf
- 11 [ER]. Access mode: <http://www.ncert.nic.in/html/pdf/schoolcurriculum/framework05/prelims.pdf>.
- 12 [ER]. Access mode: <http://www.scienceinmotion.com/minilec/gas.html>

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5E моделі арқылы нақты ғылым пәндері бойынша сабақтарды жоспарлау

Ағылшын тілінде нақты ғылым пәндерін оқыту әдістерін ұсынып, оны айқындайтын көптеген теориялық бағыттар бар. Мақалада 5 E's моделінің әдісі және оның студенттің біліміне ұсынылған ақпараттың бірегейлігі мен бекіту ерекшелігі қарастырылған, ол бес кезеңнен тұрады (тақырыпқа деген қызығушылық, ақпаратты іздеу, түсіндіру, бекіту, бағалау). Сонымен қатар алынған білімді қабылдау және бекіту, ой-өрісінің дамуына түрткі болатын әдістің әр сатысын өткізу мысалдары кестеде берілген.

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Планирование занятий по естественным дисциплинам посредством модели 5E

Существует множество теоретических направлений, предлагающих и обосновывающих те или иные методы в преподавании естественных дисциплин на английском языке. В статье рассмотрена методика модели 5 E's, уникальность которой заключается в формировании знаний у студентов посредством последовательного преподнесения и закрепления изучаемого материала, состоящего из пяти этапов (заинтересованность темой, поиск информации, объяснение, закрепление, оценивание). Кроме того, приведена таблица, содержащая рекомендации и примеры для проведения каждого этапа методики, способствующей развитию мышления, усвоению и закреплению полученных знаний.

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Роль концептуального мышления в специальности «Дизайн»

В статье рассмотрена концептуальная идея, которая может оказать существенное влияние на композиционное решение здания и всей предметно-пространственной среды в целом. Описана разработка концепций в процессе обучения дизайну — это немалозначимый элемент, стимулирующий творческий процесс обучения. Авторами проанализировано понятие «концепция» в теоретической и практической значимости, как методики профессиональной подготовки, дающей огромную возможность для выпуска профессионалов, которые в дальнейшем внесут большой вклад в архитектуру, в предметную среду и в индустриальное производство страны.

Ключевые слова: концепция, концептуальный дизайн, принципы дизайна, стиль, идея, концептуалисты, индустриальный дизайн, направление.

Многие принципы и методики в дизайне частично заимствованы из смежных (или параллельных) профилей. Нет еще ответа на вопрос: что «ОН» такое, этот самый дизайн? Дизайн проник во все уголки мира, о нем говорят и дискутируют, много и пишут. За ответами на возникшие вопросы следует еще больше вопросов. Термин «design» — английское слово, производное от итальянского