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The Theme Park Experience of Teaching Science from the Constructivist Paradigm

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Abstract

Using Theme park rides to teach science/physics is one of the possible authentic experience one can offer to the science students. The physics of the rides as an alternative way of teaching forces, such as, G-force, centrefugal /centrepetal, free fall, acceleration, and conservation of kinetic and potential energy, is definitely an innovation students love to have in their learning experience. And, allowing students to actually experiencing the forces in action and enabling students to actually measuring the forces using a gravitometer that they designed are grand examples of not only meaningful learning can be established but learning with enjoyment can be made achievable too in the students' learning outcomes. As, students by their youthful nature enjoy the rides such as the roller coasters and the freefall towers that deliver white-knuckle thrills in a safe environment.

In our UiTM science education program, among the courses included is a course named SCE553- Creativity and Creative Teaching in Science and Theme Park is one of the major units of the course. This paper shares the course experience in general and in particular pertaining to the unit of Theme Park as an alternative way of teaching science/physics. The unit of Theme Park organized around three main innovative activities, there are, 1. Designing a gravitometer, 2. The theme park rides, and 3. A class presentation/ discussion of the science/physics of the rides. The SCE553 course structure is designed using the constructivist framework emphasizing inquiry approaches in teaching, highlighting among others, the creative dimension in the learning outcome. The paper also offers a brief description of the course philosophy and its outlines. Learning outcomes as seen from the eyes of student-teachers as appeared in their reflective essays will be shared in order for the reader to capture the true essence of a constructivist approach in teaching that not only nurturing the creative and innovative elements in the student-teachers but also the soft skills, such as, leadership, communication, and presentation.

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1. Introduction

From the constructivist paradigm of teaching science, authentic experience is greatly emphasized as experiential learning enables students to appreciate science and a sure way of getting students interested in science. But, how to get this message across to the student-teachers in a science teacher preparation program such that this constructivist paradigm can be translated into a reality in their classroom practices with confidence when they are in schools in the later years? Isn't it the best effective way is by showing the student-teachers the practical approach by means of experiencing the constructivist paradigm that encompasses authentic experience by themselves? The above conception form the guiding principle in designing the SCE courses in the UiTM science teacher preparation programme.

This paper shares the course experience of SCE553-Creativity and Creative Teaching in Science in general and in particular pertaining to the unit of Theme Park as an alternative way of teaching science/physics. The unit of Theme Park is organized around three main innovative activities, there are, 1. Designing a gravitometer, 2. The theme park rides, and 3. A class presentation/ discussion of the science/physics of the rides.

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2. A creative curriculum

The short coming in the learning outcome of science students in general pertaining to thinking and interest have been acknowledged by science educators. How to enhance scientific thinking in students? How to get students to see science in action and excited about science other than bring them to a good Science Centre? It is to address these noble questions that science education reform suggests the possible use of some non-traditional method of approach in science instruction such as those that are based on the constructivist paradigm that emphasize on student center, hands-on mind-on, group work, and etc. In terms of research, focus has been on the emphasis of out of class room activity, such as science museum visit, field trip, and playground/amusement park. Cartoon movie such as Tom and Jelly has been used often in the teaching related to mechanic. However, using science fiction movies has been suggested but rarely applied in practice.

In the SCE553- creativity and creative teaching in Science course for the in-service program we have introduced several innovative approaches in teaching targeting the nurturing of creativity to a higher level. The topic outline of the course is as followed (Table 1):

Table 1. Course Outline

Content
Course Induction:
Game Participation: Students take turn to demonstrate a unique way of crossing a path/Creative puzzle
Torrance's Creative Thinking
The Unnatural Thoughts in Science
Creativity in Science
Baroque music in learning
Fostering Creativity in Science

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