



Chapter 13

Computer–Aided Instruction in a Science Lesson Slowmation Development Study: Example of Phases of the Moon

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ABSTRACT

Rapid advances in science and technology have revolutionized science courses and significantly increased the use of computer software. One of the most frequently used computer software in the science course is animations. Slowmations, which are one of the animation types, are a very powerful teaching material especially in science subjects where certain stages follow each other, to eliminate misconceptions and to better comprehend abstract subjects by students. The aim of this study; primary school 5th grade science lesson is to develop a slow-motion animation as a guide material for the subjects of “Moon’s Properties, Movements and Phases”. Slowmation consisting of 14 scenes voiced in the language was prepared. With the inclusion of the prepared material, the misconceptions of the students will decrease, in the 21st century. It is thought that their skills will improve and their interest and motivation towards science and technology will increase. It is also foreseen that the lessons taught with this guide material will be more effective and enjoyable.

INTRODUCTION

Science Teaching

In the renewed Ministry of National Education curricula, it is emphasized that the needs of individuals and society have changed because of the rapid change in technology and that the roles expected from individuals have been affected due to this change. According to the requirements of the age, individuals are expected to be able to produce and effectively use knowledge, solve problems, have a critical perspective, have an enterprising spirit, and have high communication skills. When the science curriculum

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is examined, it aims to provide individuals with all these qualities, but aims to make students science literate. The objectives of the Science Curriculum, which is based on the General Objectives and Basic Principles of Turkish National Education, include the acquisition of basic knowledge, the adoption of scientific process skills and research approach, the development of sustainable development awareness, the use of science in solving daily life problems, the development of career awareness and entrepreneurship skills, and the adoption of scientific ethics principles. In addition, The Science Curriculum is structured to develop students' science process, life, engineering and design skills (Mone, 2018).

When the content of the science course is examined, a lot of abstract information draws attention. Considering that middle school students have just entered the period of abstract operations, choosing different techniques that concretize concepts increases the quality of teaching (Bal et al., 2020). Science, Engineering and Entrepreneurship practices, which have been added to the Science Curriculum in recent years, aim to enable students to identify a need or problem they encounter in daily life, develop alternative solutions within the scope of material, time and cost criteria, and design and produce products in this direction. Within the scope of science, engineering and entrepreneurship practices within the program, students identify a problem related to the topics covered in science courses and design their products by creating solutions to this problem. Students also develop entrepreneurial skills by developing product marketing strategies and present their products to customers using promotional tools (Mone, 2018).

Education is the process of changing the behavior of individuals and science education has a very important place in the development of nations and individuals. Science education contributes to the development of students' cognitive as well as psychomotor skills. One of the difficulties encountered in the science education process is the concretization of abstract subjects. For this purpose, learning models based on the use of technology and teamwork are very effective. Educators are also using examples from daily life more frequently to attract students' interest, keep their motivation high and strengthen their interpretation skills (Pak, 2020). In the process of science teaching, educators are expected to adopt a research and inquiry-based approach with an interdisciplinary perspective. According to Mone (2018), teachers are expected to guide students to reach the level of high-level thinking, product development, invention, and innovation, while students are expected to develop their reasoning and communication skills by expressing their own opinions in a democratic classroom atmosphere. The strategies in the curriculum aim to teach in student-centered learning environments. For students to learn information in a meaningful and permanent way, classroom/school and out-of-school learning environments are designed according to research and inquiry-based learning strategies. In addition, students are encouraged to develop their communication and creative thinking skills by expressing themselves in written, oral and visual ways (Mone, 2018).

Technology in Science Education

The studies on combining education with technology and the teaching models developed in the light of these studies have made educational technologies a research field (Keskin, 2019). The concept of technology used with education is often used by researchers to refer to innovation. In addition, the concept of technology, which has many definitions and application areas, refers to information and communication technologies in education (Çakıroğlu, 2013).

Technology can basically be defined as the process of creating tools and equipment capable of enabling human beings to organize their environment according to their own wishes (McDermott & Teich, 1997). While these tools can be very tangible such as telescopes, glasses, headphones, they also include

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