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Prospective Biology Teachers' Views about Turkish Videos related to Parts and Usage of Microscope

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Abstract

The aim of the study was to determine fourth grade prospective biology teachers' views about Turkish videos related to parts and usage of microscope. Study group consisted of 27 fourth grade prospective biology teachers in Necatibey Faculty of Education in Balıkesir University in Turkey in 2012-2013 academic years. Although there are several English videos related to parts and usage of microscope on internet, there are only two Turkish videos about them. The first video was watched by the students and they were asked to write their ideas about the video in order to data collection. Later, the same application was performed for the second video. Data was analyzed by using content analysis method. After themes and sub-themes of the responses of the students were categorized, frequencies were calculated. According to the results of the study, the students emphasized that both two videos had some problems such as insufficient video narration, film making problems and lack of interest of videos.

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1. Introduction

Biology investigating interactions of living things with each other and environment is a branch of science. Biology aims that previously individuals understand the world realistically by recognizing themselves, gain the skills like critical and creative thinking, they can apply these knowledge and skills into daily life and they must be open minded towards lifelong learning in addition to be researcher quality (Taşkın Ekici, Ekici, & Taşkın, 2002). Furthermore, success of students should be increased by means of several teaching techniques in biology education. Misunderstandings in biology should be determined and decreased in biology lessons (Yeşilyurt, 2004; Uzel, Diken, Yılmaz, & Gül, 2011).

To create a rich learning environment, which provides participation of students by using equipment in the most efficient way towards biology course and laboratory work, is somewhat important for fulfillment of efficiently (Köseoğlu & Soran, 2006). Laboratory work gives opportunity students to apply knowledge getting from course by concreting abstract subjects (Uzel et al., 2011). In short, laboratory based biology teaching provides asking question, entrance in process actively, determination problem, finding suitable solving problem ways by creating common study area. It can be said that laboratory based education is necessary for active biology teaching (Taşkın Ekici et al, 2002).

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1.1. Parts and usage of microscope

In biology laboratory courses many work are conducted by using microscope. Microscope is an equipment providing investigation of image by magnifying too small items by means of objectives (Mikroskop). Light microscopes are generally used in biology laboratory work. Teaching of parts and usage of microscope is important and useful for biology laboratory work. A light microscope has four items: Structure parts, optical parts, light source and adjustment knobs. Structure parts are arm, base, body tube and stage. Optical parts involve three lenses: Ocular lens system, objective lens system and condenser. Light source is composed of low voltage lamp. Iris diaphragm helps in controlling amount of light that reaches specimen. Adjustment knobs are coarse and fine adjustment knobs (Genel Zooloji Laboratuvar Klavuzu).

Phases of microscope usage:

- Put the microscope slide on the microscope stage with the support of stage clips.
- Start with the ocular (10X) that is the lowest magnifying level and the objective (4X).
- Hold the microscope stage at the top with the coarse adjustment knob.
- Find the image at the microscope slide by moving coarse adjustment knob up and down.
- Use the ocular (10X) to magnify the image and use coarse adjustment knob and fine adjustment knob to make it clear.
- While you are working with the objective (40X), use the fine adjustment knob. Otherwise objective's lens can be scratched or microscope slide can be broken.
- While you are working on dark color objects, firstly light amount can be increased by the light adjustment knob or the iris diaphragm.
- When microscope study is completed, firstly take the objective into the smallest magnifying position, hold down the stage, and gather the cables of microscope. Finally, clean the microscope, leave it the place you have taken (Mikroskop yapısının tanıtılması).

1.2. Usage of visual materials at biology laboratory work

In order to increase effectiveness of biology teaching, it is crucial that subjects are taught according to students' needs and at the stimulus environment (Doğan et al., 2003). University level science courses which are based on lecturing but, they should be supported with visual materials such as internet and videos (Kearar, Baruch, & Grobeld-Dahan, 2005). Changing and developing technology becomes requirements day by day so new learning opportunities should be presented according to developing technology (Akkoyunlu, 1995). Learning activities that will trigger prospective teachers' visual and thinking skills are improved and used increases permanent of knowledge by distracting students' attention.

Visual materials help the students for actively understanding of difficult and abstract concepts. There are many technological instruments and types such as internet, video, smart board and etc. in recently (Çepni, Taş, & Köse, 2006). Visual materials should include correct information about subject domain. It has also other qualities such as being suitable for the aim of the course, understandable, and adequate for technically.

Educational video that is one of the visual materials makes knowledge visualization, besides there are benefits in cognitive (learning, memory, recall) and physiologic (motivation) (Pekdağ, 2010). Video based teaching plays important role in concretization and understanding of information. Furthermore, video can be more attractive because it has both visual and auditory properties, and video can increase motivation of prospective teacher.

It can help meeting needs of prospective teachers having different learning styles. Video provides to investigate dangerous and expensive process safely. It is useful due to the fact that it can be watched again and again. Therefore, it saves up time and money.

2. Method

2.1. Purpose

The aim of the study was to determine fourth grade prospective biology teachers' views about Turkish videos related to parts and usage of microscope.

2.2. Study group

Study group consisted of 27 fourth grade prospective biology teachers in Necatibey Faculty of Education in Balıkesir University in Turkey in 2012-2013 academic years.

2.3. Data collection and data analysis

In this study, videos related to “parts and usage of microscope” in Turkish have been searched in several websites such as YouTube and Dailymotion. Only two videos in Turkish about parts and usage of microscope were observed (Mikroskobun yapısı; Mikroskop kullanımı). However, there are a lot of videos in English about parts and usage of microscope. For example, the titles of the videos are ‘How to use a microscope, How to correctly use a microscope.’

First video in Turkish (Mikroskobun yapısı) used in this study is 7 minutes 28 seconds. Firstly microscope was told that it had two parts and the parts of microscope have been described in the video. The parts of the microscope have been mentioned shortly using by zoom techniques. Phases of finding the image on the microscope have been showed by using a ready microscope slide. Second video in Turkish (Mikroskop kullanımı) is 2 minutes 24 seconds. Parts of microscope have been described and the names of the parts of the microscope have been shown by lines in the video. The task of the parts of the microscope was told (finding image by coarse adjustment knob and making image clear by fine adjustment knob and etc.).

The first video was watched by the prospective biology teachers and then, the prospective biology teachers were asked to answer the open-ended question in order to data collection. The question was that: ‘you have been watched a descriptive video about the parts and usage of microscope. What do you think about the video?’ Later, the same process was done for the second video.

Data was analyzed by using content analysis method (Yıldırım & Şimşek, 2006). The views of the students about Video 1 and Video 2 were analyzed separately. The students' responses to the question were categorized under themes and sub-themes. Frequencies (f) were given in Table 1.

Finally, the new video has been recorded by taking into consideration of the views and suggestions of the prospective biology teachers about Video 1 and Video 2 in the current study. The narration of the video has been made by the research assistant working at Biology Education in Necatibey Faculty of Education in Balıkesir University. During the video recording, it has been benefited from zoom and pan record techniques. Recorded videos have been combined (mounting).

3. Findings

The views of prospective biology teachers about Turkish videos (Video 1 and Video 2) related to “parts and usage of microscope” have been given in the Table 1. As seen in Table 1, the following themes and sub-themes were obtained from the study: Narration, microscope, video, content, narrator and environment.

While most of the students found that the explanations about subject were not enough and it has not been told elaborately about both Video 1 and Video 2 (12, 10), some students thought differently from other students about Video 1: Narration and explanations were enough (10). Most of the students said that the description of the parts of the microscope was not adequate about both Video 1 and Video 2 (6, 14). Some of the students said that carrying the microscope was fault about Video 1 (6). Additionally, some students made the following explanations about Video 2: The phases of the microscope usage should have been displayed more elaborately (5) and the appropriate phases

of holding up the microscope were not used (5). Most of the students had those views about Video 1 and Video 2: There were problems about film making techniques. The face of the narrator was not seen. Zoom should have been used (7, 10). Five of the students said that Video 1 was not attractive. Two students' views toward Video 1 and three students' views toward Video 2 were that preparation of microscope slide was not told. Three students' views toward Video 1 and one student's view toward Video 2 were that the narrator' tone was insufficient. Four students' views toward Video 1 and nine students' views toward Video 2 were that the physical condition of the environment (background) was not appropriate. Nine of the students also said that ambient light was insufficient about Video 2.

Table 1. Prospective biology teachers's views about video 1 and video 2 related to parts and usage of microscope

Theme	Sub-theme	Video 1 f	Video2 f
Narration	1. Sequence of the subject was not true.	6	-
	2. Subject was told rapidly.	2	-
	3. Explanations about subject were not enough. It has not been told elaborately.	12	10
	4. Concept of a ready microscope slide has not explained.	6	-
	5. Language of the narration was not clear and understandable.	-	1
	6. Narration and explanations were enough.	10	-
	7. Narration was monotonous and boring.	2	5
Microscope	8. Type of the microscope was not told.	2	-
	9. Carrying of the microscope was fault.	6	-
	10. Cleaning of the microscope was not told at the beginning of the video.	3	2
	11. Description of the parts of the microscope was not adequate.	6	14
	12. Phases of usage of the microscope should have displayed more elaborately.	-	5
Video	13. Proper phases of holding up the microscope were not used.	-	5
	14. Video was not attractive.	5	-
	15. There were problems about film making techniques. The face of the narrator was not seen. Zoom techniques should have been used.	7	10
	16. Aim has not been told at the beginning of the video.	-	3
Content	17. Effects and writing usage in the video were attractive.	4	3
	18. It has not been told how to make a microscope slide.	2	3
Narrator	19. There must be someone near the narrator who described the microscope.	1	-
	20. Narrator's tone was not enough.	3	1
Environment	21. Physical condition of the environment (background) was not appropriate.	4	9
	22. Ambient light was insufficient.	1	9

4. Conclusion and recommendation

According to the results of the study, it can be said that the prospective biology teachers have generally negative views about Video 1 and Video 2 in Turkish related to parts and usage of microscope. Most of the students emphasized that both two videos had some problems such as insufficient video narration, insufficient description of microscope's parts, film making problems and lack of interest of video. On the other hand, some students stressed that the explanation and narration of Video 1 were sufficient.

According to the related literature review, there has not been come acrossed any study about vidoe of parts and usage of microscope. It is thought that Video 1 and Video 2 are much more appropriate for secondary school education. In short, those videos icluding description and usage of microscope were not suitable for General Biology Laboratory I courses at university level since those videos were not suitable for the aims and objectives of General Biology Laboratory I courses. Accordingly, in this study a new video has been recorded regarding the views and suggestions of the prospective biology students who were the study group of the study about parts and usage of microscope for General Biology Laboratory I courses.

Although there are a lot of methods and techniques for courses in biology education, it is important that those courses should be supported with several visual materials such as internet, video, simulation and etc. to make learning permanent. Since students have different learning styles and needs, development of prospective teachers' visual and mental skills must be aimed with teaching environment enriched with visual materials. Furthermore, laboratory work in biology education must also be carried out in the environment enriched with visual materials. However, usage of selected multimedia visual materials for the courses should be planned well. A good material must also save time and costs. Educational laboratory course videos that are one of the visual materials may be useful for repetition of learning and completion of deficits in their knowledge in laboratory work. A good quality video describing parts and usage of microscope not only illustrates students' questions about usage of microscope but also can decrease problems about usage of microscope. Videos to be used for laboratory work in biology education must be examined in internet carefully and then, the most suitable videos in terms of narration, filming techiques must be preferred for teaching biology and biology laboratory work.

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