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CLINICAL STUDY

Educational Use of Digital Video in the Context of Practical Work in Dentistry Prospective Evaluation Survey of the Optimal Duration of Educational Films by Second-Year Students of Dentistry in Rabat

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ABSTRACT
The transmission of knowledge is a critical step that requires dedication and logistic assets to achieve the desired objective.
Among these advantages, there is the online launch of educational films on the university's platform which aims at the improvement of understanding by students, and the information provided during practical work. For this, we have made three videos on the implementation of shaped clasps, while fixing the duration of the films successively at 8min50, 5min05 and 3min30. The videos were evaluated by the entire class through a questionnaire distributed to students who were present in the practical work training session. The biostatistical analysis revealed the preference to be for the 8min50 video with an initial viewing percentage of 59.3%. At a second and another viewing, the preference was successively in favor of the 5min05 video (54.5%) and that of 3min 30 (43.4%). Furthermore, the students' favorite videos were those with a time interval of 10 to 20 minutes (46.9%) for upcoming educational materials.

KEY WORDS: Film, pedagogy, clasps, duration, practical work.

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INTRODUCTION

The transmission of knowledge is a critical step that requires dedication and logistic assets including the online launch of educational films on the university's platform.
Indeed, education that is a constantly changing universe was traditionally organized on the basis of exchange or interactions in a classroom or amphitheater bringing together students and a teacher. Currently, social media facilitate the establishment of a new type of teaching and learning, representing a challenge for the more conventional forms of pedagogy. Online training, using this tool, is a structure that is called "techno-educational". [1]
The visual effectiveness depends primarily on its broadcasting to the greatest number of people and ability to become a product tailored to the service of the trainer who created it. Educational films allow the transmission of a large amount of information in a short time through the use of the image, voice and keywords. The receipt of information becomes smoother than by reading a text material, in addition to the actual demonstration in the classroom of practical work. We therefore assist to the improvement of understanding, memorizing and learning through the free and multiple access to dynamic, original and publicized material. Music can be used, which provides the film with an aspect that is both fun and attractive while maintaining the relevance of content and seriousness of the message conveyed. Thus, it provides real value to training. [2] [3]
According to Karsenti, "many studies show that a student can learn more, and faster, with information and communication technologies (ICT) and online courses than face to face in a classroom." He also points other benefits of using ICT, such as: flexibility, possibility for

everyone to adopt a pace of their own, opportunities of increased interaction and communication, and the variety of teaching and learning methods which increase students' motivation. [4] Moreover, according to Dubois "The integration of information and communication technologies for education (ICTE) in medical training is a hot topic in most of our faculties" [5].

If the benefits of integrating ICT in education have been extensively studied and used in other fields [6], and since ICT is appreciated by students [7], their use has remained limited until recent years in medical studies. [8]

J.M. Casillas and V. Gremeaux specified that the Internet and social media facilitated the establishment of a new type of teaching and learning, representing a challenge for the more conventional forms of pedagogy. [1] [9]

To fully benefit from the implemented project, it would be necessary first of all to define the objectives, to proceed with the script of the educational film before its implementation and to choose the length of the film that needs to be the most beneficial for a maximum of information transmission. The defined objectives would better frame the project, opting for the most relevant technical choices. The objective of this work is to assess the impact of the duration of educational films made available to the student, based on their level of attractiveness and reveal the most suitable duration for a good understanding and no risk of fatigue.

METHODS AND MATERIAL

A descriptive study was conducted to determine the preferred duration for educational films by second-year students of Dentistry, within the framework of practical work of resin partial denture, in addition to presentations and demonstrations assigned to students during practical work.

We made three videos on the practical application of the implementation of shaped clasps, keeping the same content but fixing the duration of the films successively to 8min50, 5min05 and 3min30, while accelerating certain sequences.

The videos were made available to the students on the Youtube channel of the Mohammed V University -Souissi with a link to the platform. They were evaluated by the entire class through a questionnaire distributed to students who were present at the practical work training session. Students were divided into four groups of 39 students each for a smooth practical work and for better learning.

We emphasized in this questionnaire on the preferred video, on the order of preference at a first viewing, at a second viewing and at another viewing with justification of the choice. We also asked about the preferred sequence length for upcoming videos, namely a sequence of 20 to 30 minutes, a sequence of 10 to 20 minutes and a sequence less than 10 minutes. The reasons for preferences were summarized into three: more explanation, less fatigue or both (more explanation and less fatigue). Different reasons were coded and introduced as variables for statistical analysis.

Statistical analysis: Data analysis was performed using SPSS, Inc., Chicago IL. Age was expressed as average ± standard deviation (M±SD). Other variables were all expressed in numbers and percentage. Associations between the viewed video, preferred video, preferred video at a first viewing, at a second viewing, at another viewing and sex; between the viewed video, preferred video, preferred video at a first viewing, at a second viewing, at another viewing and different groups; between sex, groups, reason for preference and the preferred time interval; between viewed videos, preferred videos, preferred videos at a first viewing, at a second viewing ,at another viewing and the reason for preference were analyzed using chi-square test or Fisher's exact test. P <0.05 was regarded as level of significance.

RESULTS

In total, the questionnaire was filled by 145 students who were present at practical work sessions.

General characteristics (Table I)

Characteristics	Values N= 145
Age (years): M ± SD	19,26 ± 0,73
Sex (%)	Men : 38 (26,2 %) Women : 106 (73,1 %)
Groups (%)	Group 1 : 38 (26,2%) Group 2 : 36 (24,82%) Group 3 :39 (26,89%) Groupe 4 :32 (22,06%)
Viewed videos (%)	None : 2 (1,4 %) All: 7 (4,8 %) Some : 97 (66,9%)
Preferred videos (%)	Video of 8 min 50: 85 (58,6%) Video of 5 min 05 : 42 (29%) Video of 3 min 30 : 9 (6,2%)
Preferred videos at a first viewing (%)	Video of 8 min 50: 86 (59,3%) Video of 5 min 05: 35 (24,1%) Video of 3 min 30 : 15 (10,3%)
Preferred videos at a second viewing (%)	Video of 8 min 50: 39 (26,9%) Video of 5 min 05 : 79 (54,5%) Video of 3 min 30 : 18 (12,4%)
Preferred videos at another viewing (%)	Video of 8 min 50: 32 (22,1%) Video of 5 min 05 : 41 (28,3%) Video of 3 min 30 : 63 (43,4%)
Preferred time nterval (%)	Sequence between 20min et 30min :25 (17,2%) Sequence between 10min et 20min :68 (46,9%) Sequence lass than 10min :52 (35,9%)
Reason for preference	More explanation : 25 (17 ,2%) Less fatigue 53 (36,6%) More explanation and less fatigue67 (46,2%)

Table I: General characteristics of studied variables

Comparative study

A statistically significant difference was noted between boys and girls regarding the viewed videos (p <0.001), the preferred video (p = 0.009), the preferred video at a first viewing (p = 0.008), at a second viewing (p = 0.011) and at another viewing (p = 0.010). We noted a female predominance among students who viewed one to two films launched on the platform of the faculty (71.1%). 70, 6% of students preferred the video of 8min 50.

At a first viewing, the video of 8min 50 was always preferred with 69.8% of female predominance.

At a second viewing, it was rather the video of 5min05 that was preferred by 74.7% of students.

At another viewing, the majority of students chose the video of 3min 30 (76.2%). (Table II)

Statistical analysis showed no statistically significant difference between the viewed videos (p = 0.088), preferred videos (p = 0.475), preferred videos at a first viewing (p = 0.053, at a second viewing (p = 0.481), and at another viewing (p = 0.09) regarding student groups (Table III).

Characteristics	Boys N= 38	Girls N= 106	p
Some viewed videos (1 to 2)	28 (28,9%)	69 (71,1%)	< 0.001
Preferred video of 8min 50	25(29,4%)	60(70,6%)	0.009
Preferred video at a first viewing (8min 50)	26(30,2%)	60(69,8%)	0.008
Preferred video at a second viewing (5min 05)	20(25,3%)	59(74,7%)	0.011
Preferred video at another viewing (3min 30)	15(23,8%)	48(76,2%)	0.010

Table II: Frequency of viewed videos, preferred videos, preferred videos at a first viewing, at a second viewing and at another advice based on sex.

Characteristics	Group 1 N=38	Group 2 N=36	Group 3 N= 39	Group 4 N= 32	p
Some viewed videos (1 to 2)	31(32%)	25(25,8%)	24 (24,7%)	17 (17,5%)	0.088
Preferred video of 8min 50	25(29,4%)	24(28,2%)	25(29,4%)	11(12,9%)	0.475
Preferred video at a first viewing (8min 50)	27(31,4%)	20(23,3%)	22(25,6%)	17(19,8%)	0.053
Preferred video at a second viewing (5min 05)	22(27,8%)	18(22,8%)	24(30,4%)	15(19%)	0.481
Preferred video at another viewing (3min 30)	19(30,2%)	16(25,4%)	20(31,7%)	8(12,7%)	0.09

Table III: Frequency of viewed videos, preferred videos, preferred videos at a first viewing, at a second viewing and at another viewing based on student groups

Characteristics	Sequence between 20 min and 30min N=25	Sequence between 10 min et 20min N=68	Sequence less than 10 min N= 52	p
Female	18(72%)	46 (67,6%)	42(80,8%)	0.182
More explanation and less fatigue	-	67(98,5%)	-	**< 0.001**

Table IV: Distribution of preferred time interval based on sex and reason for preference.

We also noted a significant difference for the reason for preference concerning the preferred video by students (p = 0.013) and preferred video at a second viewing (p = 0.034): the video of 8min50 was preferred due to the maximum of explanations and the minimum of fatigue (48.2%). Similarly, the video of 5min05 was preferred at a second viewing because it provided more explanation and caused less fatigue (46.8%). Otherwise, the statistical analysis showed no statistically significant difference between the various reasons for preference regarding the viewed videos (p = 0.231), the preferred video at a first viewing (p = 0.167), and the video preferred at another viewing (p = 0.097) (Table V).

DISCUSSION

Of the 145 students, our sample showed a female predominance (73.1%). Students had an average age of 19 years. More than half of the students viewed only one or two videos (66.9%).

Of all the videos, the preferred video was that of 8min50 with a percentage of 58.6%. Also for the first viewing, the video of 8min 50 was also preferred by the majority (59.3%) which shows that students needed the full video (8min50) giving details on the various stages of the implementation of the shaped clasps.

At a second and another viewing, preference was successively in favor of 5min05 video (54.5%) and that of 3min 30 (43.4%) which can be justified by the students' wish to master the steps in a minimum amount of time and without the feeling of fatigue for subsequent viewings.

Furthermore, students preferred videos with a time interval of 10 to 20 minutes for upcoming practical work (46.9%). The reason for preference of the studied videos was providing the maximum of explanations and causing the minimum of fatigue (46.2%) which makes these educational films tools with multiple advantages. They help give meaning to the skills acquired by students, strengthen and reactivate skills in a new context in favor of a concrete realization, encourage a regular and relevant practice of blended learning and a more involvement of Information and Communications Technology (ICT). Student users can communicate, have access to sources of information, store, manipulate, produce and transmit information in all forms: text, document, music, sound, image and video.

The use of such films has many advantages; such as flexibility because students can learn at their own pace, from the place they want (limited by the need to have internet access). Moreover, these films are free from the geographical dispersion of students and teachers while avoiding schedule-related constraints. [10].

It should be noted that E-learning means all the tutorials made for learning through electronic means. The ability to develop teaching situations outside the classroom allows the creation of blended forms of education and distance learning.

There are few studies assessing the validity of e-learning. A recent meta-analysis of over 200 studies concluded that e-learning seems to have comparable efficacy to the more conventional teaching[11].

The optimal duration of an online video depends mainly on the objectives, content and target audience. The golden rule is to never create a too long or too short video. [12] The file size and bandwidth limits must also be taken into account because the video must be viewed quickly and smoothly. It has been shown that users watched short videos in their entirety, while those whose duration was long have led to a loss of interest. It also appears that users

do not appreciate too short videos as they do not provide enough information [13] [14]. This was confirmed by our study where preference was towards the video of 8min 50 and with the time interval of 10 to 20 minutes.
The educational film is certainly a supplementary teaching material to teachers, facilitating the acquisition of knowledge and promoting the learning of know-how. By using the techniques of slow motion and acceleration, it allows access to knowledge that is impossible without its contribution.
Baraka says that to encourage memorization, it is necessary to put very evocative key elements. On the other hand, the length of the film should be limited and not exceed 15 minutes in order to keep the learners' attention. [15] The film should be concise, capable of sparking off a reaction, not including too many items at once, and with no unnecessary redundancy.

The contribution of knowledge is progressive, so that the student does not get lost. The pace should be slow to allow reflection and memorization.
The scenario must be established from known elements and understood by the designer; it is thus essential to remove the unnecessary, insist on the key facts and provide all the facts prior to the final situation. [15]
Thouvenin concluded in his study in 2013, that a third of students said they did not see the film, and that the reasons behind this were technical reasons (difficulty to have access to the internet, difficulty related to file size), but also educational because of the length of the film (lasting for 23 minutes). [10]
The peculiarity of our study lies in the absence of previous national studies concerned with the optimal duration of an educational film for demonstration, designed for dental students. Obtained preliminary observations could therefore be a reference for future studies.
There are, however, some limitations to our study, such as no internet access for some students, some did not view the files available to them, and others preferred to leave empty spaces in the questionnaire which does not allow exact evaluation of the responses of the entire class.
As for recommendations, it is recommended to motivate and encourage students to view educational films on the internet before arriving to the classroom for practical work training and especially before filling the educational questionnaires so as not to have biased results of the studies. On the other hand, the focus should be placed on the flip classroom which is a pedagogical approach that is reversing the traditional roles of learning.
According to Mazur, teachers do not have to put their energy into the first stage: students can pass it by themselves, access to information has become very easy, especially thanks to its availability on the Internet or specific software. The method of flip classroom is to ask students to seek information for themselves through the use of electronic tools. Then, in the classroom, students should work in small groups to solve problems. [16] [17]
Mazur also emphasizes that nothing clarifies ideas more than the fact of explaining them to others. In the classroom, we must build on the interaction; students must discuss the issues with the colleague sitting next to them and try to convince him/her. [16]
It should be specified that in order to confirm the results obtained, it is necessary to extend the study to students of other classes (3rd-year students specifically, the 4th and 5th-year students benefit from clinical internships rather than practical work).

CONCLUSION

Audiovisual media contribute to the transfer of knowledge, success and employability of students. The obtained results revealed the attractiveness of 8min50 video at a first viewing, that of 5min05 at a second viewing and that of 3min30 at another viewing.
The video sequence of 10 to 20 minutes was preferred to the 20 to30 minutes sequence and the sequence less than 10 minutes. This was related to the amount of explanations provided in a minimum amount of time which could guide us in carrying out future educational material.
We must place the student dentist at the center of our educational concern in the same manner as the patient is placed at the center of our medical concern; namely, technical training, acquisition methods, reflection on practice and comparison of different data.

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COMPETING INTERESTS

The authors declare no competing interests.

AUTHORS' CONTRIBUTIONS

The participation of each author corresponds to the criteria of authorship and contributorship emphasized in the Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly work in Medical Journals of the International Committee of Medical Journal Editors. Indeed, all the authors have actively participated in the redaction, the revision of the manuscript and provided approval for this final revised version.

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