# Videos as teaching and learning resources for developing pre- and in-service teachers' professional digital competence in the ICTMOOC

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**Abstract.** This study provides an insight into the preferred length of videos in the online course ICTMOOC aimed at the development of professional digital competence with pre- and in-service teachers in Norway. The *one-way ANOVA test* (Field, 2013) was used for the analyses of participants' responses about the preferred length of videos in the ICTMOOC.

Findings reveal that the learners preferred the videos in the range of 5-10 min. These findings have therefore implications for the design of videos for MOOCs and online courses.

Keywords: Videos, MOOCs, online courses

### 1 Introduction

This study examines the length of videos that was preferred by the students engaged in learning in the online course ICTMOOC offered at Ostfold University College in Norway. The ICTMOOC is aimed at the development of professional digital competence with pre- and in-service teachers as a part of their teacher training and professional development programme. Since 2014 when the ICTMOOC was offered for the first time, the course has become increasingly popular with pre- and in-service teachers, which may indicate contemporary demand for flexible online education that intends to bridge the educational journey from theory to practice.

In online learning, as well as other types of learning, student engagement is considered a necessary prerequisite for learning (Guo, et al., 2014) and videos are one of most wide-spread tools used to enhance students' engagement in online learning (Evans, et al., 2016; Hew, 2016; Rose, 2009). However, research on the length of videos suitable for asynchronous online courses (Singh & Mørch, 2018) is still relatively scarce. This study addresses this gap by examining the following research question:

RQ1: What length of videos was preferred by the participants in the ICTMOOC?

#### 1.1 Video resources in online courses and MOOCs

In studies on the use of lecture videos, students report enjoying the videos and finding their classes engaging (Choi & Johnson, 2005; Whatley & Ahmad, 2007). Guo and colleagues (2014) reported that shorter and informal talking-head videos, where instructors speak fast with high enthusiasm and videos produced with a more personal feel could be engaging for learners. Like Guo and colleagues (2014), other researchers (Reutemann, et al., 2016) found that talking head videos are the most preferred by learners in four MOOC platforms (edX, Coursera, FutureLearn, and Iversity).

The length of the educational videos in MOOCs is a widely discussed topic. Some researchers argue that short videos are most suitable for educational purposes (Bonk, 2011; Guo et al., 2014). On the one hand, Guo and colleagues (2014) introduced a "six minutes rule" as an optimum length for videos in MOOCs. On the other hand, Lagerstrom and colleagues (2015) believe that the "six-minute rule," valid for a MOOC environment, does not capture the video viewing behaviours of students in standard college courses and how long students watch a video depends on how motivated the student is to study.

Although the observations outlined here indicate that videos can be a powerful resource to enhance students' engagement in learning, the discussion on the length of videos in online courses is lacking consensus. We addressed this knowledge gap by examining participants' preferred length of videos in the ICTMOOC.

## 2 Method

#### 2.1 Participants and setting

Data collection was conducted through the questionnaire administered to all the pre- and in-service teachers engaged in the ICTMOOC in 2014 - 2018. The questionnaire aimed to examine participants' experiences in the ICTMOOC. In total 501 participants responded to the questionnaire in 2014-2018. The majority of participants in the ICTMOOC in 2014-2018 were females, in-service teachers and they were either strongly satisfied (M=28.82%, SD=4.71) or very strongly satisfied (M=67.67%, SD=6.42) with the ICTMOOC.

#### **2.2 ICTMOOC**

The ICTMOOC was first introduced in Norway in 2014. The course was developed by the researchers and development specialists from Ostfold University College. The online course ICTMOOC has a structure of an xMOOC (Singh & Mørch, 2018), it is built in the Canvas platform and is aimed to enhance the development of digital competence with pre- and in-service teachers. The ICTMOOC consists of 10 Modules to be completed by the participants over the course of 10 weeks. Table 1 presents the list of Modules included in the ICTMOOC and the progress plan the participants are to follow.

Title of Modules	Progress Plan
	(week number)
Module 0. Introduction	Week 34
Module 1. Taking notes digitally	Week 35
Module 2. Microsoft Office and collaborative writing	Week 36
Module 3. Digital Presentations	Week 37
Module 4. Tweaking Pictures	Week 38
Module 5. Video and Animations	Week 39
Module 6. Digital Assessment	Week 40
Module 7. Interactive Whiteboard	Week 41
Module 8. Web Publishing	Week 42
Module 9. Student Response Systems	Week 43
Module 10. Digital Tools for Students With Individual Needs and	Week 44
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Table 1. Modules included in the ICTMOOC and the progress plan

Each Module contains textual information, videos, individual tasks, and multiplechoice quizzes. In total, there are 223 videos in the course, 174 of them have been produced by the course developers and stored at the YouTube Channel. 179 videos are tutorials (so-called 'How To' videos) and forty-one videos discuss the pedagogical aspects of the use of digital tools. The total length of all videos in the course is 22h 29min 39sec and the average length of a video is 6min 3sec. In several Modules, in addition to textual information, videos and multiple-choice quizzes, students are expected to complete practical exercises, give and receive peer feedback and submit examination tasks. On successful completion of the ICTMOOC (evaluated to passed or failed), participants are awarded 15 ECTS Credits (European Credit Transfer and Accumulation System). Over 80% of enrolled students passed the ICTMOOC in 2014-2018.

#### 2.3 Data and Analyses

To address the research questions in this study, the following questions were included in the questionnaire administered to the participants in the ICTMOOC in 2014-2018: Q11: What is your overall experience about the use of videos in the ICTMOOC? (applied a Likert scale from one to five (one = 'very weakly satisfied,' two = 'satisfied,' three = 'somewhat satisfied,' four = 'strongly satisfied' and five = 'very strongly satisfied'), Q12: What do you think about the length of the videos in the ICTMOOC? (applied a Likert scale from one to five (one = 'too short,' two = 'short,' three = 'appropriate,' four = 'long' and five = 'too long'); and Q13: What length of videos do you think is the most appropriate for the ICTMOOC? (participants were to mark one of the suggested lengths: 0-2 min, 3-4 min, 5-6 min, 7-10 min, 11-15 min, 16-20 min, 21-30 min, and 31-45 min)

The data consisted of 501 participants' responses to questions 11, 12 and 13. The *one-way ANOVA test* (Field, 2013) was used to analyse statistical difference between the participants' responses to questions 11, 12 and 13.

## 3 Findings

The analysis of participants' preferred length of the videos in the ICTMOOC starts by examining students' responses about their overall experience of using videos in the ICTMOOC (*Q 11: What is your overall experience about the use of videos in the ICTMOOC?*) (Table 2).

Table 2. Participants' responses about their overall experience of using videos in the ICTMOOC

Years	2014	2015	2016	2017	2018	Mean (M)
Very weakly satisfied	1.3%	0%	0.5%	0.5%	0.7%	M=0.60% SD=0.47
Weakly satisfied	0%	4.5%	0%	0%	0%	M=0.90% SD=2.01
Somewhat satisfied	6%	3.1%	2.2%	0.8%	0.3%	M=2.48% SD=2.26
Strongly satisfied	34.9%	24.2%	30.6%	28.5%	23.6%	M=28.36% SD=4.68
Very strongly satisfied	57.8%	68.2%	66.7%	70.2%	75.4%	M=67.66% SD=6.42
One-way ANOVA test				p = 0.00	0	

The *one-way ANOVA test* (Field, 2013) shows a significant statistical difference<sup>1</sup> between the participants' responses: the majority of pre- and in-service teachers were very strongly satisfied (M=67.66%, SD=6.42) with the use of videos in the ICTMOOC in 2014-2018.

Table 3 presents participants' responses about their experiences of the length of videos in the ICTMOOC (*Q 12: What do you think about the length of videos in the ICTMOOC?*)

Table 3. Participants' responses about the length of videos in the ICTMOOC

Years	2014	2015	2016	2017	2018	Mean (M)
Way too short	0%	0%	0%	0%	0%	M=0.00% SD=0.00
Too short	1.2%	0%	0%	0%	0.7%	M=0.38% SD=0.55
Appropriate	62.7%	80%	83.6%	93.1%	92.9%	M=82.46%SD=12.45
Too long	39.8%	23.1%	16.4%	8.5%	9.2%	M=19.40% SD=12.86
Way too long	0%	0%	1.4%	0.8%	0%	M=0.44% SD=0.64
One-way ANOVA test				I	p = 0.000	

The data indicate the difference between the participants' experiences of the length of videos in the ICTMOOC. The *one-way ANOVA test* (Field, 2013) shows a significant statistical difference between the participants' responses: the majority of

<sup>&</sup>lt;sup>1</sup>p> .05 indicates no significant statistical difference between the means of samples (Field, 2013)

participants (M=82.46%, SD=12.45) considered the length of videos (average 06min 03sec) in the ICTMOOC in 2014-2018 appropriate.

Table 4 presents participants' responses about the preferred length of videos in the ICTMOOC (*Q13: What length of videos do you think is the most appropriate in the ICTMOOC?*)

Table 4. Participants' responses about the preferred length of videos in the ICTMOOC

Years	2014	2015	2016	2017	2018	Mean (M),
0-2 min	1.1%	1.7%	1.2%	1.4%	2,1%	M=1.50% SD=0.41
3-4 min	4.7%	9.2%	4.3%	5.1%	8,3%	M=6.32% SD=2.26
5-6 min	40.7%	27.3%	42.1%	36.2%	40.4%	M=37.34%SD=6.03
7-10 min	40.4%	45.5%	41.5%	38.9%	37.4%	M=40.74%SD=3.08
11-15 min	9.3%	12.2%	8.7%	13.5%	7.8%	M=10.30%SD=2.43
16-20 min	3.5%	4.1%	2,2%	4.1%	3.3%	M=3.44% SD=0.78
21-30 min	0.3%	0%	0%	0%	0.3%	M=0.12% SD=0.16
31-45 min	0%	0%	0%	0.8%	0.4%	M=0.24 SD=0.36
One-way				p =	0.000	
ANOVA test				-		

The data show the differences between the participants' preferences about the length of videos in the ICTMOOC. The *one-way ANOVA test* (Field, 2013) shows a significant statistical difference between the participants' responses: the students preferred the videos in the range of 5-6 min (M=37.34%, SD=6.03) and videos in the range of 7-10 min (M=40.74%, SD=3.08).

## 4 Discussion, implications and directions for further research

The analyses performed in this study focused on examining the preferred length of videos in the ICTMOOC by addressing the research question: *What length of videos was preferred by the participants in the ICTMOOC?* 

First, the pre- and in-service teachers expressed their satisfaction with the videos: the majority of participants were very strongly satisfied (M=67.66%, SD=6.42) with the videos in the ICTMOOC in 2014-2018. This may indicate that the videos were used by the participants extensively for various types of support. However, by doing so, the learners may have demonstrated their dependency on the videos and the support the videos provided.

Second, while the participants were very strongly satisfied with the videos in the ICTMOOC, the majority of students (M=82.46% SD=12.45) considered the length of videos appropriate (average length of videos in the ICTMOOC is 06min 03sec). Specifically, the students reported that the videos in the range of 5-6 min (M=37.34% SD=6.03) and the videos in the range of 7-10 min (M=40.74% SD=3.08) were preferred in the ICTMOOC.

In sum, the majority of participants were strongly satisfied with the videos in the ICTMOOC. In addition, the learners indicated that the videos in the range of 5-10 min were preferred in the ICTMOOC in 2014-2018.

There are several pedagogical implications for designing videos facilitating students' learning in digital environments.

First, the preferred length of videos in the range of 5-10 min might have implications for the design of videos in MOOCs and online courses aimed at the development of professional digital competence with the participants.

Second, the pre- and in-service teachers' strong satisfaction with the videos may indicate that videos are useful resources to facilitate learning in online environments. This may also emphasise the importance of the types of support videos provide to learners. Further research will, therefore, benefit from a mixed method study, providing qualitative and quantitative evidence about the types of support videos provide to the participants in online environments.

These findings, therefore, inform practitioners, MOOC, online courses' developers and educational video producers about the length of videos preferred by the participants in the ICTMOOC aimed at the development of digital competence with pre- and in-service teachers. They also emphasise the crucial importance of practitioners' awareness about the suitable length of video resources for the purpose of integrating these resources to enhance pedagogy and students' learning.

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