Virtual classroom use in short learning courses

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Virtual classroom use in short learning courses: An exploratory study

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Abstract

Contemporary virtual classroom (VC) systems are promising tools for teaching in online and blended learning programs. They offer practicable means to facilitate complex learning and (academic) enculturation. This study evaluates a free-of-charge short learning course (called 'micro module') for (aspirant) teachers and educationalists that introduces and promotes VC-use in present-day educational settings. Central to this short course were four one-hour VC-sessions that addressed (a) utility and usability issues and (b) topics related to (complex) learning and teaching in VC-environments. The sessions were distributed over a one-week period; each day both an afternoon and an evening version of a session were organized. Approximately 280 persons signed-up for the program. Between 5 and 10 percent of these subscribers took part in one or more VC-sessions. The recordings of the sessions were viewed around 160 times in total (count one month after the program ended). Relatively low numbers of participation and recording views question the return of investment of delivering a VC-rich short learning course. However, those participants who took part in the VC-sessions highly valued its content and structure (*M*=7.9; Mdn=8; Mode=9; ten-point scale). Especially the hands-on VC-experience was appreciated. Results further show that organizing non-compulsory VC-sessions at fixed moments leads to a low turnout in these sessions. High quality content doesn't seem to affect that. Additional research is necessary to confirm these findings.

Keywords: online learning, synchronous online learning, virtual classroom, short learning program.

1. Introduction

Interest in synchronous online learning grows rapidly. We define synchronous online learning (SOL) as an educational learning situation that features a "permanent separation (of place) of the learner and instructor during planned learning events where instruction occurs in real time such that students are able to communicate with other students and the instructor through text-, audio-, and/or video-based communication of two-way media that facilitates dialogue and interaction" (Martin, Ahlgrim-Delzell, & Budhrani, 2017, p. 5). Both in regular educational settings (where in person teaching and learning is the norm) and in distance learning programs (that mainly include asynchronous interaction), teachers and students increasingly adhere to web-based technologies that facilitate such learning (Martin et al., 2017; Sun, Liu, Luo, Wu, & Shi, 2017). Not only the 'technology push' is responsible for this increase, but also the growing awareness among teachers and educationalists that synchronous interaction (i.e., student-student, student-teacher and student-content) is of great importance in learning (Chen, Wang, Kirschner, & Tsai, 2018; De Hei, Strijbos, Sjoer, & Admiraal,

2016; Ertl, Fisher, & Mandl, 2007). Until recently, synchronous interaction in education was limited to live events where people meet in person (i.e., classroom sessions, meetings) or (conference) phone calls. However, proliferating internet technology ensures that synchronous communication via digital text (chat), audio (audio conferencing), video (video conferencing) and combined (multimedia, visual avatars, web conferencing) is now within reach of most teachers in distance and regular education. New digital technologies make complex online interaction possible and therefore offer ample opportunities to create online learning environments that facilitate cooperative and collaborative learning (Green, 2016; Kreijns, Kirschner, & Jochems, 2003). Hrastinski (2008) argues that synchronous communication allows for learning with a personal touch: it helps to increase arousal, motivation, and convergence on meaning in educational activities. In addition, it facilitates commitment to group learning and (academic) enculturation. As such, synchronous communication is a crucial constituent in the development of (online) learning communities (De Hei et al., 2016; Kreijns et al., 2003).

An important contemporary online instrument that combines several modes of synchronous communication is the virtual classroom (VC). The VC fits the aforementioned definition of SOL (Martin & Parker, 2014). The instrument enables two-way communication between students and teachers so that different forms of instruction can be provided. Christopher (2015) mentions eight key features of a VC: (a) content sharing, (b) screen sharing, (c) audio, (d) chat, (e) drawing and pointer tools, (f) polls, (g) instant feedback, and (h) breakout rooms. These functionalities provide for interaction, but above all make clear that the VC is a multimedia tool that needs to be used with care (Clark & Mayer, 2016). Otherwise, there is a risk of cognitive overload for both the learner and the instructor during a session. Such load may hamper learning as well as teaching. It may be obvious that knowledge and skill in designing, developing, and delivering a VC-session is an absolute necessity in order to actually run one.

At the Open University of the Netherlands (OUNL), teachers regularly provide VC-sessions. Depending on the learning goals that are central to a VC-session, instruction in sessions may include expository forms of direct instruction (Blanche, 2019) or inquisitory types of collaborate learning techniques (Barkley, Major, & Cross, 2014). Since the OUNL implemented a new educational model that prescribes that students should study in cohorts (Schlusmans, Van den Munckhof, & Nielissen, 2016), the latter type of instructional methods is receiving increasing attention in the professionalization of teachers at the OUNL. More insight in the effectiveness of cooperative and collaborative learning (Barkley et al., 2014; Johnson & Johnson, 2009) and skill in using computer-supported collaborative learning techniques is essential to fuel the SOL-trend in online and blended forms of education (cf. Hrastinski, 2008, 2019).

This paper presents experiences of the OUNL with the use of the VC in its institution. The focus is on an initiative that aimed at disseminating knowledge about online learning gained at the OUNL over the years (see Wopereis, Pannekeet, Melai, Schlusmans, Van den Munckhof, & Moerkerke, 2019). This initiative included a series of six short learning units, called 'micro modules', that addressed didactical, technological, and managerial issues related to designing, developing, and implementing online education. In this paper, we specifically turn to the fourth module called 'The Virtual Classroom' that aimed at gaining the participants knowledge on the VC-instrument and getting acquainted with its use. Participants learned knowledge on VC-technology and didactics by means of instruction in the VC. We chose this hands-on approach, because there is no better way to learn about a VC than to experience one (cf. Merrill, 2002; Schank, Berman, & McPherson, 1999).

The micro module had to fit a specific course format and study load could not exceed four hours (Wopereis et al., 2019). These restrictions meant that the focus couldn't be on complex skill learning or competence

development (e.g., learning the complex skill to design and deliver a VC-session for higher education students; Van Merriënboer & Kirschner, 2018). Therefore, we decided to focus on knowledge acquisition (i.e., VC-features, VC-technology, and VC-didactics) and organize hand-on experiences. Example-based learning (Van Gog & Rummel, 2010) was the premise of our micro module. This means that studying worked-out examples (which are product-oriented) and modelling examples (which aim at learning systematic approaches to problem solving) are at heart of the instruction. In this micro module, we presented such information through a video-recorded expert interview.

The aim of this study was to gain knowledge on VC-use in open online small learning courses (e.g., our micro modules). Although there is literature available on the overall quality of short open learning courses, like massive open online courses (MOOCs; Magaryan, Bianco, & Littlejohn, 2015), less is known about the quality of constituents of such courses that require synchronous communication. These constituents, such as online chat and VC-based Q&A-sessions, are often optional course features and therefore not mentioned in evaluations. Our exploratory study addresses this issue and specifically focus on the value of SOL in short learning initiatives.

The study was guided by the following research questions: (a) how do participants behave in small-scale open online courses where VC-sessions form the backbone of an educational unit, and (b) how do they value such VC-centred course.

2. Method
We studied the micro module (i.e., the product of our instructional systems design [ISD] activities) and its use by means of a small-scale evaluation. The study can be classified as an exploratory case study (Yin, 2014).

Participants
The participants in this study were educationalists, teachers, and students enrolled in the micro module 'The Virtual Classroom'. At the start of the micro module (March 18, 2019) about 140 persons had registered for this short learning course. This number increased to 283 during the module. A subset of the participants attended the live VC-sessions (VC-1: n=27; VC-2: n=14; VC-3: n=16; VC-4: n=12; see Table 1). These participants provided most data for this study.

Materials
The materials relevant for this study included (a) the micro module on VC, (b) the VC-sessions that were central to the module, and (c) the online course evaluation form.

Micro module
The micro module 'The Virtual Classroom' was the fourth module in a series of six modules on online education. The other five micro modules discussed (a) online education as a whole (general introduction), (b) activating in online education (ISD and didactics), (c) virtual reality in online education, (d) assessment in online education, and (e) research on online education (see Wopereis et al., 2019). All micro modules were delivered to the participants via yOUlearn, the course management system of the OUNL (Hermans, Kalz, & Koper, 2014; Vogten & Koper, 2018). The ISD-teams used specific design templates to ensure uniformity in the presentation of content. Each module lasted for two weeks. Study load was two to four hours. Participants could attend micro modules at their own pace. However, guidance and feedback was provided during the first two weeks only. Active online learning was central to all modules, meaning that participants could participate in both asynchronous (e.g., discussion forum) and synchronous (e.g., chat and VC) learning tasks. In yOUlearn participants could make use of a discussion forum for general questions and remarks and an 'after session

chat' for content discussions. Central to the micro module were four VC-sessions entitled (a) the Virtual Classroom (What is a VC?), (b) Learning and Teaching in the Virtual Classroom (How to design, develop, and deliver a VC?), (c) Complex Learning in the Virtual Classroom (How to design, develop, and deliver a VC for complex learning?), and (d) Future Developments. Each session was introduced in yOUlearn. Figure 1 shows a screenshot of the welcome page of the micro module. The structure of the course is presented in the left margin.
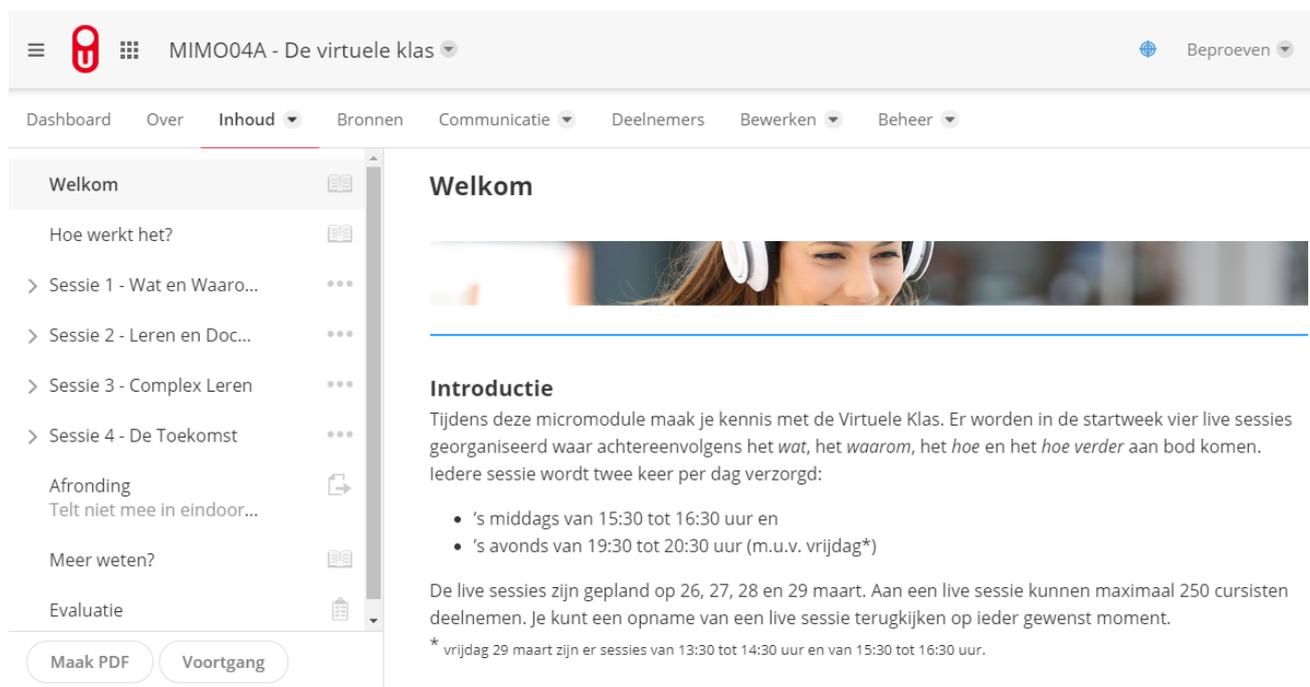

Figure 1: Graphical user interface of the micro module.

The four sessions were preceded by a general introduction on the content and structure of the course. Each learning task that included a live VC-session had a similar format. First, we activated prior knowledge by means of a small assignment. Second, we presented some theory on the subject. Third, some technical and procedural information related to attending a VC-session was provided to the participants and subsequently the actual VC-session took place. Four, an 'after session chat' was organized where participants could ask additional questions. After the last VC-session, we offered additional food for thought (i.e., references to literature) and kindly asked the participants to fill in an online evaluation form.

Virtual classroom sessions
The backbone of the micro module were four one-hour VC-sessions. We provided participants information in yOUlearn on how to successfully attend a VC-session (e.g., technical support on how to use Collaborate Ultra, the VC-software used). Active online learning was the guiding principle for the instruction offered in each session (cf. Wopereis et al., 2019). Although we were not sure how many participants would actually participate in the sessions, we decided to implement complex collaborative learning techniques (CoLTs; Barkley et al., 2014). We applied the 'three-step interview' technique in the first session where participants introduced themselves and learned general knowledge about VCs and VC-use. In the second session on learning and teaching in the VC, we implemented the classical working group (participants had to create a global blueprint for instruction). The third session on complex learning included an assignment where the 'fishbowl technique' was applied (i.e., a small group of participants solves a problem [inner circle]; other participants [outer circle] 'observe' the problem-solving process and discuss it in the chat). The fourth session

contained a two-step discussion on the future of VC-use in education (i.e., small-group discussion first, whole-group discussion second). To provide flexibility, each session was offered twice a day to the participants (i.e., an afternoon session and an evening session; on Friday an early afternoon session and a late afternoon session). Participants could attend an 'after session chat' in yOUlearn after each VC-session. Two OUNL educationalists/lecturers moderated both the VC-sessions and the 'after session chats'. Participants who could not attend a live VC-session could playback one or more recording of the session and reread the VC-chat contributions.

Evaluation form
We developed an online evaluation form that was part of the educational content in yOUlearn. It included a question on the perceived quality of the micro module (scale 1 tot 10) and open questions to record information on strengths and weaknesses of the course.

Procedure
After the fourth VC-session, participants were asked to fill in the online evaluation form. The data of the 'after session chat' sessions were recorded in Word. All the data were anonymized before they were analyzed. We analyzed data in SPSS (perceived quality) and thematically 'by hand' (open questions and chat data) in Word and Excel. Participants who did not attend the live sessions and only watched the VC-recordings could also fill in the online evaluation form. These data have been included in the analysis.

3. Results

Two hundred and eighty-three educational professionals and students (eventually) registered for the micro module, but not all of them entered a live VC-session. Each session had between 12 and 27 participants. If we focus on each version of a session (each session was offered twice a day), the results show that between 4 and 15 participants attended one of the variants. Table 1 presents the participation in sessions. If we take the overall enrolment into account, this means that a low percentage of registered participants entered (one or more) VC-sessions. Two comments on the evaluation form addressed this issue. The participants who wrote these comments were disappointed that so few people took part in the sessions.

Table 1: Participation

VC Session	Time	Participants			Playback recordings			
		Learners	Teachers	Total	R1	R2	R3	Total
1. Introduction (VC 101)	14:30 – 15:30	15	2	17	28	12	-	40
March 26, 2019	19:30 – 20:30	12	2	14	6	8	-	14
	Total 1	27	4	31	34	20	-	54
2. Learning and teaching	14:30 – 15:30	7	2	9	4	10	-	14
March 27, 2019	19:30 – 20:30	7	2	9	-	-	-	-
	Total 2	14	4	18	4	10		14
3. Complex learning	14:30 – 15:30	5	2	7	3	7	-	10
March 28, 2019	19:30 – 20:30	11	1	12	12	24	-	36
	Total 3	16	3	19	15	31	-	46
4. Future developments	13:30 – 14:30	8	2	10	11	12	20	43
March 28, 2019	15:30 – 16:30	4	2	6	-	-	-	
	Total 4	12	4	16	11	12	20	43

Note: each session was performed twice a day; R1=first recording; R2=second recording; R3=third recording

We deliberately offered each day two version of a session. By doing this, we hoped to that those who had registered for the micro module had sufficient opportunity to attend a session. We also recorded sessions. In

all sessions, participants were assigned to small-groups that performed tasks in so-called breakout rooms. Interaction in the breakout rooms was not recorded. Only the instruction and feedback in the 'main room' in the VC were recorded. This is the reason that more than one recording for each session exists (see R1, R2, and R3 in Table 1; R=recording). Recordings were viewed 157 times (VC-1: n=54; VC-2: n=14; VC-3: n=46; VC-4: n=43). It should be noted that the second version of VC-2 and VC-4 were not recorded and that most sessions had only two recordings (see hyphens in Table 1). Based on the comments that have been logged in the evaluation forms and the 'after session chat' we know that some VC-participants viewed the recordings of the sessions they attended. However, we assume that most views can be attributed to registered participants who could not attend the live VC-sessions.

Twenty-three participants filled in the online evaluation form. They valued the quality of the micro module and responded to the open questions. Participants were positive about the module. They rated it on average 7.9 (*SD*=1.93; Mdn=8). The distribution of the scores was left-skewed (-2.3), which means that the mean and median were left to the peak (see Figure 2). The mode was 9.
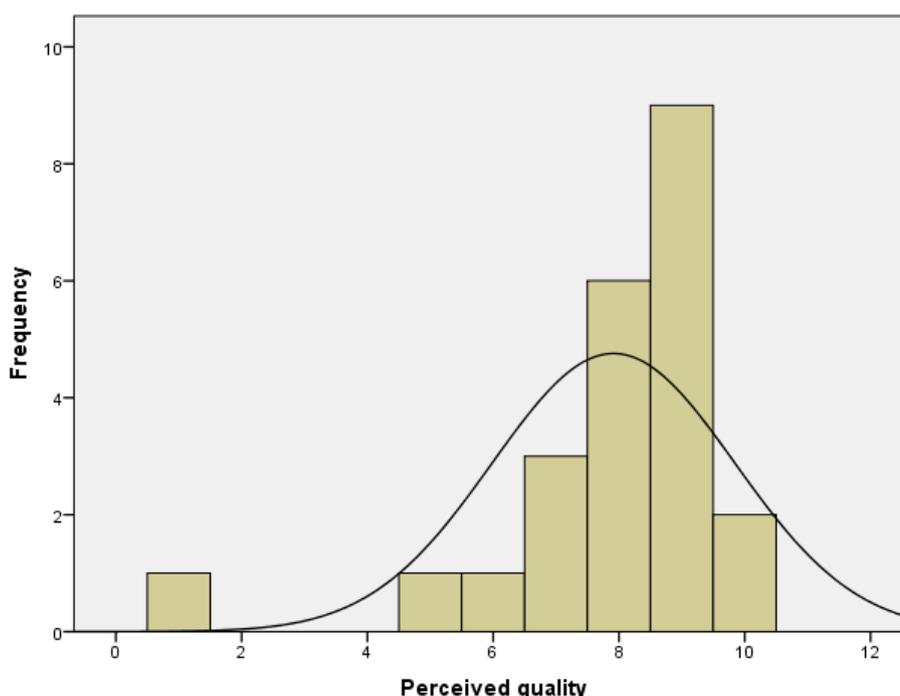

Figure 2: Frequency distribution of participants' perceived course quality

The open questions yielded 47 responses. Twenty were categorized as strengths, 17 as weaknesses, and 10 as 'neutral'. Eleven of the 20 strengths were related to the hands-on experience in the VC-sessions. Participants were positive about getting the opportunity to learn about the VC as a tool for (complex) learning and teaching. Four strengths appreciated the didactical approach in the sessions (e.g., active learning in group) and two stressed comprehensiveness. Weaknesses were related to recordings (e.g., where to find them), low attendance rate, scheduling of the sessions, and didactical approach (e.g., parts of sessions resemble a tutorial; webinar). The results of the analysis of the 'after session chat' show that this course feature was not popular. There was only some activity in four out of eight chat sessions. Nine participants joined one of these four

sessions (VC-1-afternoon: n=3; VC-1-evening: n=3; VC-2-evening: n=2; VC-4-afternoon: n=1). Topics in these sessions addressed (a) technical problems (e.g., sound), (b) ideal teacher-student ratio in VC-sessions, and (c) a word of thanks to the moderators/lecturers.

4. Discussion

The aim of this exploratory case study was to gain knowledge on VC-use in open online small learning courses. The case at hand was a micro module on VC-use that was part of a series on online learning (Wopereis et al., 2019). We specifically looked at participants' behavior (i.e., participation) and perceived course quality. When we consider participation, we notice a difference between the number of registered participants and the participation in the live sessions. Between 5 and 10 percent of the micro module's subscribers actually took part in one or more VC-sessions. Scheduling of the sessions was mentioned twice in the evaluation as reason not to attend. Besides the scheduling, we think that many registered participants just wanted to *know* more on the subject of VC instead of actually *experiencing* a VC. For them the theory that was presented in yOUlearn was probably sufficient to meet their goals. Additional research should reveal if this is the case. A gap between enrollment in online programs and active participation in non-obligatory SOL-activities is not new. For instance, at the OUNL we experience this phenomenon in courses where students can attend optional VC-group sessions. Often the participation rates in these sessions are relatively low. A recent observation of an OUNL MOOC on Big Data confirms this. In this course, 70 of the 900 registered participants attended a VC-mediated Q&A-session. There seems to be a '10-percent participation rule' for VC-sessions in short open SOL-centered courses, that is, about 10 percent of registered participants actually attends optional VC-sessions. The numbers of participants in VC-sessions in open short courses will probably increase when VC-sessions are obligatory (i.e., necessary for certification and/or achieving learning objectives). Future research on the funnel of SOL-participation should address this issue (cf. Clow, 2013, Magaryan et al., 2015). An interesting feature of a VC is the possibility to record a session so that it can be reviewed. Recordings of VC-sessions in the micro module were viewed 157 times. This number would probably be higher if participants were notified when a recording was available. Now, participants had to find the overview of links to recordings in yOUlearn themselves. Remarks of participants on the evaluation form made clear that this was not as obvious as expected.

Our limited view on participation in this study makes clear that more observational research is needed. We suggest that additional research on participants' behavior in open SOL-centered courses should focus on the actual behavior of participants in the course environment and in the VC-session. Analyzing navigation data in yOUlearn and video recordings of VC-sessions might be an interesting next step. Especially the observation of participation in VC-sessions would be of interest. Then we can for instance learn more about the reasons of a small portion of participants that decided to leave a session when the instructor explained that group work was central to that session. These participants probably just wanted to 'lurk' and not actively participate in activities. Additional interviews can be used to validate findings.

If we consider the quality of the micro module, we can conclude that this instructional format is promising. Participants gave high ratings and reactions in the evaluation were mainly positive. Especially the hands-on experience in the VC and the didactical approach (i.e., example-based learning) were valued. Based on this, we think that the micro module is an ideal stepping-stone to the development of a short learning program (SLP; Thaler & Bastiaens, 2017). A more comprehensive SLP could address the issue of fully learning the complex skill of designing, developing, and delivering VC-sessions. Learning (and instructing) complex skills requires far more time and effort than a micro module can offer. In order to learn a complex skill, participants should have the opportunity to activate prior knowledge related to the skill, observe demonstrations of the skill in question, apply new knowledge on the skill, integrate this new knowledge with existing knowledge, and do all this in a

task-centered instructional setting where authentic tasks are the foundation for the instruction (Merrill, 2002; Van Merriënboer & Kirschner, 2018; Wopereis, Frèrejean, & Brand-Gruwel, 2015, 2016). In order to increase instructional effectivity, efficiency, and engagement (Ebner & Gegenfurtner, 2019; Keller, 2008; Merrill, 2002), stakeholders such as teachers, VC-moderators, and aspiring participants, should all be included in a process of instructional co-creation (Moerkerke, 2015) that follows an agile-like ISD approach (Adnan & Ritzhaupt, 2018; Allen, 2017).

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