International Journal of Business, Human and Social Sciences
ISSN: 2517-9411
Vol:9, No:11, 2015

Design of Mobile Teaching for Students Collaborative Learning in Distance Higher Education

Lisbeth Amhag

Abstract**—**The aim of the study is to describe and analyze design of mobile teaching for students collaborative learning in distance higher education with a focus on mobile technologies as online webinars (web-based seminars or conferencing) by using laptops, smart phones, or tablets. These multimedia tools can provide face-to-face interactions, recorded flipped classroom videos and parallel chat communications. The data collection consists of interviews with 22 students and observations of online face-to-face webinars, as well two surveys. Theoretically, the study joins the research tradition of Computer Supported Collaborative learning, CSCL, as well as Computer Self-Efficacy, CSE concerned with individuals' media and information literacy. Important conclusions from the study demonstrated mobile interactions increased student centered learning. As the students were appreciating the working methods, they became more engaged and motivated. The mobile technology using among student also contributes to increased flexibility between space and place, as well as *media and information literacy*.

Keywords**—**Computer self-efficacy, computer supported collaborative learning, distance and open learning, educational design and technologies, media and information literacy, mobile learning.

I. Introduction

THE study has a focus on design of mobile teaching with online webinars by using mobile applications such as laptops, smart phones, or tablets. The design of teaching for collaborative learning at distance included recorded flipped classroom videos and orally online webinars face-to-face (F2F) and parallel textual chat communications with other students and teachers. The core idea of flipped classroom videos are to flip the common instructional approach with recorded teacher-created videos with various briefings and interactive instructions, based from the course goals, accessed from different locations using mobile technologies, prior to the class learning activities, as in this study before the online webinars F2F. Therefore, the recorded flipped classroom videos consists of two parts; interactive group learning activities inside the mobile online webinars F2F; and recorded computer-based individual instructions outside the classroom, which remove the outline lectures from the online webinars in order to allow better use of the in-class time during the mobile online webinars, as well as scaffold students learning activities during in-class time [1]-[3].

"Class" becomes the room / place of the mobile online webinars F2F at distance with a predefined aim, during a real-time specific period, with guidance from a teacher, to deal with problem solving, discussing theoretical concepts, reviewing the literature, engaging in various collaborative group work, and examinations. The potential of the mobile online webinars F2F is everyone can see and hear each other's orally discussions and at the same time communicate via textual chat and notes. Furthermore, the webinars can be recorded for later asynchronous viewing online within the Learning Management System (LMS) in order to provide students the opportunity to take a step back, reflect, self-assess and compare various contributions. In this situated context, it is important research focus on how mobile technologies can support student learning and collaboration in a more digitalized education, instead of merely focusing on how such new media techniques can make education more effective or detrimental e.g. [4]-[10].

In this study, following question will be illuminated:

- How and in what way do students collaborate during mobile online webinars F2F, and textual chat, prepared with recorded flipped classroom videos, as a mediating tool for learning and critical review?

II. Theoretically Approach and Analysis

Theoretically, the study joins the research tradition of Computer Supported Collaborative Learning, CSCL with emphasis on that it is not possible to understand learning solely from individual actions, as well as Computer Self-Efficacy (CSE) concerned with individuals' media and information literacy. According to a socio-cultural theory, learning always arises as a product of a social community of practice in which our understanding of language, communication, culture, and various aspects of the social context for student learning and development is central.

Wenger [11] consider sociocultural theory of learning in terms of *communities of practices* constituted by students´ negotiated engagement and joint enterprise, as well shared repertoire. There is also a question of collective appropriation of tools through language, and how students use language as a tool for learning. Wenger describes assumptions of learning and the nature of knowledge with four premises; 1) we are social beings which is a central aspect of learning; 2) knowledge is a matter of the competence to evaluate; 3) knowing is a matter of participating in the pursuit of such valuation; and 4) meaning is our ability to experience the world and engage with it meaningfully. Methodically, the concept of [11] is concretized into four components; 1) *meaning is learning as experiences;* a way of talking about our abilities, individually and collectively, to experience our life and the world as meaningful; 2) *practice is learning as doing*; a way of talking about the shared historical and social

Assist. Prof. Dr. Lisbeth Amhag is with the Malmö University, Sweden (e-mail: lisbeth.amhag@mah.se).

resources, frameworks, and perspectives that can sustain mutual engagement in action; 3) *community is learning as belonging*; a way of talking about social configurations in which our enterprises are defined as worth pursuing and our suggesting, and participation is recognizable as a competence; and 4) *identity is learning as becoming*; a way of talking how learning changes the unique person we are and creates personal histories of becoming and development in and between moment of teaching practices and professions, e.g. as hairdresser, seller, or chef and as vocational teacher. According to this perspective, people's dialogues, interactions, and interplay constitute a determining factor for the individual's learning and knowledge development in higher vocational education.

The theoretical approach of self-efficacy [12] is related to Computer Self-Efficacy (CSE), which has been used in research concerned with individuals' intentions to use information technology (IT). As in this study, to use recorded flipped classroom videos and participate in mobile online webinars F2F, as well chat, and the opportunities to challenge different efficacies and make assessments of their ability to apply knowledge, and manage and evaluate the peer learning activities, individually as collectively.

Methodically, CSE has been used and concretized through [13] three interrelated dimensions: *magnitude*, *strength*, and *generalizability*. The *magnitude* of CSE can be understood as a reflection of the student's cognitive knowledge processes, based on the abilities to analyze, communicate, manage information, and understand concepts and meta-cognitive skills, such as problem solving, interpreting, reflecting and evaluating. The *strength* of CSE refers to the self-confidence and self-esteem of the student ability to perform various tasks. *Generalizability* of CSE reflects the degree to which online studies are limited to a specific area of a learning activity, such as *media and information literacy*, and use of different software as recorded flipped classroom videos and computer systems as mobile online webinars F2F with different mobile applications.

III. Main Focus

The study monitors 22 student teachers (women=16, men=6) that participated in half-time study in the first three continuing web-based courses over a eighteen-month period in Vocational Teacher Education Program, (VTEP). The qualitative research design involved an in-depth data collection process and analysis of open-ended interviews and observations of mobile online webinars F2F. Therefore, the researcher had the opportunity to obtain a deeper inquiry per individual and collectively in order to provide possible complete understanding. Moreover, two surveys' were conducted after course 2, June 2013, and course 3, January 2014, about the training features had contributed to their learning activity and media and information literacy.

IV. Implementation

The data collection consists of recorded mobile online webinars F2F (10 sessions, 3 hours long), of which five of them were examinations and five of them prepared with recorded flipped classroom videos during spring and fall semester 2013. The student teachers (N=22) could also have parallel chat communications during the webinars. The student teachers worked during the three web-based courses over an eighteen-month period in Vocational Teacher Education Program, (VTEP) both individually and group wise with problem-based course assignments with deadlines. They were divided into five groups of four to five students in each. All webinars were scheduled with date and time for each group and with predefined goals and questions from the course literature. A summary of the design during the three courses is given in Table I.

During the mobile online webinars F2F the student teachers had discussions about theoretical concepts from course literature and experiences between teaching practices and professions, as well tutoring and scaffolding in course assignments. All ten webinars in course 2 and 3 were recorded and accessible in the learning management system (LMS) in order to provide the students the opportunity to take a step back, reflect, self- assess and compare various contributions. When the students were asked if they wanted to participate in the study they signed an agreement. They also got a guideline for the e-meeting system Adobe Connect and received an online review of the tools (webcam, microphone / headset and chat).

In the two surveys given to students in June 2013 and January 2014 the student answered the statement: *Did the following learning activities contribute to my learning in regards to?* a) course start lectures at the university, b) flipped classroom, c) webinars F2F, d) active in webinars, e) seen the flipped classroom, and f) media and information literacy.

V. Results

Important conclusions from the results of the learning activities with recorded flipped classroom, mobile online webinars F2F, and textual chat communications are that the time and space for learning expands. The student teachers highlight the webinars as a mediating resource for both individual and collaborative learning in a new academic context. One student emphasizes; "Without online webinars F2F I do not believe I had continued the studies". Another student points out "without webinars it would just be alone studies and be on your own with a stack of books". The *community of practice* [11] became a way of *learning as belonging*; were the student teachers could participate and talk about their social know-hows and creativities. The students' *magnitude* of CSE [13] was also growing through their cognitive knowledge processes, based on the abilities to analyze, communicate F2F, manage information, and understand concepts and meta-cognitive skills, such as problem solving, interpreting, reflecting and evaluating. For example, [14] shows among over 1000 students of various

ages increased commitment and motivation for studies with online webinars F2F, compared to traditional classroom teaching. Even Nelson's [15] comparative study between webinar versus classrooms at course start among 224 nursing students shows that the webinars were as effective as the course start in the classroom. No significant difference was found between these two "rooms". Likewise, shows Rich's [16] study collaborative factors as discussions and exchanges of knowledge during the online webinars F2F contributed to their learning.

TABLE I
A SUMMARY OF THE DESIGN WITH FLIPPED CLASSROOM AND MOBILE ONLINE WEBINARS F2F DURING THE THREE COURSES IN VOCATIONAL TEACHER EDUCATION PROGRAM, VTEP

Vocational Teacher Education Program, VTEP **Fall semester 2012** (half-time study)		**Course 1 VTEP -** Learning outcome about social relations, conflict management and educational leadership The course had three group wise online webinars as a follow-up of course start and tutoring of course assignments (not recorded).
Academic year 2013		(half-time study)
Date	**Length**	**Course 2 VTEP -** Learning outcome about syllabus, vocational didactics and assessment
02/15/2013	00:27:46	Flipped classroom: Theory of Pedagogy & Didactic, follow-up of course start
02/25/2013	01:16:27	Webinar: Teaching & Education, five groups, drop-in
03/15/2013	00:19:13	Flipped classroom: Theory of Formative assessment
03/21/2013	00:19:51	Flipped classroom: Theory of Assessment & Grading
03/21/2013	01:14:01	Webinar: Assessment & Grading, three groups, 25 min / group
03/25/2013	01:00:59	Webinar: Assessment & Grading, two groups, 30 min / group
05/07/2013	00:55:06	Webinar: Tutoring of the two last course assignments, five groups, drop-in
Date	**Length**	**Course 3 VTEP -** Learning outcome about development, learning and special education
09/09/2013	00:28:05	Flipped classroom: Theory of Read & writing disabilities, follow-up course start
10/14/2013	00:47:49	Webinar: Literature of Read & writing disabilities, five groups, drop-in
10/29/2013	01:04:57	Webinar: Examination of Read & writing disabilities, two groups, 32 min / group
10/31/2013	00:46:22	Webinar: Examination of Read & writing disabilities, one group
10/31/2013	00:42:36	Webinar: Examination of Read & writing disabilities, one group
10/31/2013	00:56:22	Webinar: Examination of Read & writing disabilities, one group
12/10/2013	00:34:24	Flipped classroom: Theory of Teaching & Education of vocational students
12/19/2013	00:39:50	Webinar: Tutoring of the last course assignments, five groups, drop-in

The main point raised by the student teachers of the recorded flipped classrooms is the flexibility and support prior to the online webinars. "I think they have been good, because I can look at them when I need and they are still left when I am working with the course assignments". They are also highlighted the effectiveness: "I like the flipped classroom very much, because you will be prepared and can use the lessons more effective, than just sit and listen". The same results are shown in the research review on flipped classroom by [1] and the study by [2] that students generally are positive to the working method, because, it offers students more preparation for the course content, which helps them to complete the assignments and they feel more prepared for scientific reading and academic writing, as well presentations and examinations. A similar result also appears in [17] that the students feel that it becomes a more learner centered teaching with flipped classroom, than in the traditional form of monological lectures in a classroom at the university. However, one student teacher in this study is problematizing the examination in course 3 needing to have a clearer structure and teacher leadership: “The first participant could speak for ten minutes and then there was not much time left. In addition, the task was already described in detail in text, and archived [in the LMS]. It does not need a presentation of it too”. Learning is always a matter of engagement and it depends on the opportunities to contribute actively to the *practice of community* [11] and to make creative use of each students’ respective repertoires. Nevertheless, the flipped classroom raised by the student teachers provided additional learner centered experiences when they had the capability to prepare and negotiate new meanings with support from recorded flipped classroom videos, over and over again if it was needed, before the mobile online webinars F2F by computer, laptop or mobile app for phones and tablets for further learning and collaboration. According to [11] contributes recorded flipped classroom videos *meaning* as a way of learning in scientific reading and academic writing and discover the literature as meaningful. Additionally, the students development in and between moment of teaching practices and professions, e.g. as hairdresser, seller, or chef and as vocational teacher their *identity* [11] were changing through *learning as becoming* during the online webinars F2F in collaboration with other students and teachers. One student summarizes the benefits of the working methods: “They have been a huge help for me. Even the group wise chat communication worked very well. It was also fun to give and receive peer feedback, and that we had some time to respond to the assignment. That I liked and I thought it was good and it helped me in my writing”. Fulton [18] argues for this new way of teaching and learning. Fulton has listed seven benefits of flipped classroom: (1) students can work in their own speed; (2) homework before the scheduled lectures give teachers better insight into students' reading and writing abilities, as well different

learning styles; (3) teachers can more easily assume the learning outcomes and give feed forward; (4) teaching time is used more efficiently and creatively; (5) the students' interest and involvement increases, which contributes to better learning outcome and development; (6) learning theories support new methods; and (7) the use of wearable technology provides increased flexibility.

Although, the study of [19] among 200 teachers suggest that flipped classroom brings more: a) discussions with and between the students about the authentic problems, b) research-based work, c) those who miss teaching occasions can take part of the recorded flipped classroom and webinars retrospectively, d) the method promotes the design of the in-class time and out-of-class time; e) students are more active and take more responsibility for their learning and f) the students appreciate the working methods. Another benefit show [17] that the students' grade results were significantly better if they had blended learning, as with online webinars and recorded flipped classroom videos, combined with traditional seminars and lectures at the university, compared with a group of traditional teaching and individual tests in the classroom. The research review by [3] also shows that the technology recording of the flipped classroom perceived easy to use by teachers. Likewise, observations of [20] concerning the manner in which video and text between synchronous and asynchronous media usage are used in teaching, show that the role of teachers and students and the relationships between them changed. The roles became more complex and complementary in teaching online based on the participants' conditions, needs and media literacy. Although the study by [21] shows that the course materials in recorded flipped classroom videos can offer a unique, but also a challenging opportunity for institutions to cooperate and to maximize the efficiency of higher education.

TABLE II
TWO SURVEYS RESULTS FROM JUNE 2013 AND JANUARY 2014 ON: DID THE FOLLOWING LEARNING ACTIVITIES CONTRIBUTE TO MY LEARNING?

Learning activities	**Survey 1** (68%) 1-3 Disagree - Partly agree	**Survey 1** (68%) 4-6 Agree - Strongly agree	**Survey 2** (55%) 1-3 Disagree - Partly agree	**Survey 2** (55%) 4-6 Agree -Strongly agree
University lectures at course start	33%	67 %	8 %	92 %
Flipped classroom	13 %	87 %	34 %	66 %
Webinars F2F	27 %	73 %	25 %	75 %
Active in webinars	20 %	80 %	17 %	83 %
Seen flipped classroom	20 %	80 %	8 %	92 %
Media & information literacy	0 %	100 %	0 %	100 %

The results in survey 1 (June 2013) shows the majority of student teachers (15 answers, 68%) assumed the flipped classroom, (87%) webinars F2F, (73%) contributed to their learning, in comparison with campus lectures at the start of the course at (67%). However, most of the students had retrospectively reviewed and reflected on the contents of the recorded flipped classroom videos (80%). Likewise, the majority of them considered they had been active during the webinars (80%) by discussing different perspectives. All students feel they need to have media and information literacy (100% strongly agree).

In the second survey, after the third course (January 2014) the majority of student teachers (12 answers, 55%) assumed the lectures at the start of the course (92%) contributed to their learning, the webinars (75%), and a little fewer by the flipped classroom (66%). However, all students had retrospectively reviewed and reflected on the contents of the recorded flipped classroom videos (92%). Likewise, the majority of students' considered they were active during the webinars (83%) by discussing different perspectives. All students feel they need to have media and information literacy (100% strongly agree). In the open- ended questions, some students required even more knowledge exchanges and interactive collaborations.

The two surveys indicate that all student teachers assumed they had *generalizability* of CSE [13] limited to this situated area at distance to use different software such as recorded flipped classroom videos and mobile online webinars F2F with parallel chat communications which shapes their *media and information literacy*. The majority of the students' show also *strength* of CSE through their self-confidence and self-esteem to take advantage of the recorded flipped classroom videos and thus be able to be more active in the online webinars F2F and perform various tasks in VTEP on an academic level.

VI. CONCLUSIONS

The emerging pedagogy in using recorded flipped classroom and online webinars F2F, in line with this study, can be considered as a new design for learner-centered education at distance on a higher level. The teaching online methods contributed to more training elements and learning activities to discuss authentic problems and research-based work [19]. The teachers received also a better insight of the students' reading and writing skills [18], which needs to be supported in all academic studies. As the student teachers were appreciating the working methods online, they became more engaged and motivated in learning and in their studies. The technology using also contributed to increased flexibility between space and place, as well as *media and information literacy*, both for teachers and students. Moreover, the design of distance teaching for students centered learning in higher education can be considered as an updated version of the "knowledge-building environments for progressive discourse" stated by [22, p. 37-38] through the integration and implementation of recorded flipped classroom videos and the follow-up mobile online webinars F2F. As well, mobile technologies can be extended to smart glasses, smart

watches, or other new devices. Twenty years ago, [22], [23] argued that various programs and courses must integrate and implement e-mail, bulletin boards and presentation material more thoroughly in the education. They also pointed to the importance for students to see themselves as active knowledge builders, not as passive recipients. Moreover, it is essential for students to be able to identify their own knowledge needs, recognize what is unclear, confusing, doubtful, incoherent, and so on. The role of the teacher is to give feed up, feedback and feed forward [4]-[6] and show commitment to increasing the learning and development.

In a modern design of centered learner in distance higher education, teachers should include following learning activities:

- Recorded flipped classroom before follow-up webinars F2F
- Webinars with group discussions on course content, literature, theories, concepts, problem solving and exchanges of knowledge and experiences
- Tutoring and scaffolding in scientific reading and academic writing, as well media and information literacy
- Peer feedback, co- and self-assessment and critical review of own and other's work
- Collaboration through shared whiteboard, notes, as well as documents
- Split screen and software with others
- Examinations online of some course assignments

REFERENCES

[1] Bishop, J. L., & Verleger, M. A. (2013). *The Flipped Classroom: A Survey of the Research.* Paper presented at the 120th ASEE Conference & Exposition.

[2] Long, T., Logan, J., & Waugh, M. (2014). *Students' Perceptions of Pre-class Instructional Video in the Flipped Classroom Model: A Survey Study*. Proceedings of Society for Information Technology & Teacher Education International Conference 2014. VA: AACE.

[3] Roehl, A., Reddy, S. L., & Shannon, G. J. (2013). The Flipped Classroom: An Opportunity to Engage Millennial Students through Active Learning Strategies. *Journal of Family & Consumer Sciences, 105*(2), 44-49.

[4] Amhag, L. (2011). Students´ Argument Patterns in Asynchronous Dialogues for Learning. In *Research Highlights in Technology and Teacher Education 2011,* (pp. 137-144): Ed/ITLib Digital Library http://storefront.acculink.com/aace.

[5] Amhag, L. (2012). High school students' argument patterns in online peer feedback. E. Favaron, P. M. Pumilia-Gnarini, E. Pacetti, J. Bishop & L. Guerra (red.), In *Handbook of Research on Didactic Strategies and Technologies for Education: Incorporating Advancements*, Ch. 62, s. 711-723, vol 2. Retrieved Sep. 18, 2012 from http://www.igi-global.com/chapter/high-school-students-argument-patterns/72113

[6] Amhag, L. (2013). Creativity in and between Collaborative Peer Assessment Processes in Higher Distance Education. In *Creative Education*, 4(7A2), pp. 94-104, (Special Issue on Higher Education), DOI: 10.4236/ce.2013.47A2011.

[7] Lee, K., & Salman, R. (2012). The Design and Development of Mobile Collaborative Learning Application Using Android. *Journal of Information Technology and Application in Education,* JITAE Vol.1 No. 1 2012 PP.1-8.

[8] Rockinson-Szapkiw, A. J., Courduff, J., Carter, K., & Bennett, D. (2013). Electronic versus traditional print textbooks: A comparison study on the influence of university students' learning. *Computers & Education* (63), 259-266.

[9] Kiriakidis, P. (2010). How Does Skype, as an Online Communication Software Tool, Contribute to K-12 Administrators' Level of Self-efficacy? *International Journal of Leadership in Educational Technology, 1*(9), 1-29.

[10] Sana, F., Weston, T., & Cepeda, N. J. (2013). Laptop multitasking hinders classroom learning for both users and nearby peers. *Computers & Education* (62), 24-31.

[11] Wenger, E. (1998). *Communities of Practice - Learning, Meaning, and Identity*. New York: Cambridge University Press.

[12] Bandura, A. (2002). Growing primacy of human agency in adaption and change in the electronic era. *European Psychologist 7*(1), 2-16.

[13] Compeau, D. R., & Higgins, C. A. (1995). Computer self-efficacy: Development of measure and initial test. *MIS Quarterly* 19 (2), 189–211.

[14] Siirak, V. (2012). Moodle E-learning Environment as an Effective Tool in University Education. *Journal of Information Technology and Application in Education,* JITAE Vol. 1 Iss. 2 2012. pp.94-96 www.jitae.org

[15] Nelson, Leslie Susan (2010). *Learning outcomes of webinar versus classroom instruction among baccalaureate nursing students: A randomized controlled trial.* Dissertations and Theses, Graduate School of the Texas Woman´s University, Denton, Texas

[16] Rich, R. L. (2011). *A framework for synchronous web based professional development.* University of the Pacific. Stockton, California

[17] Baepler, P., Walker, J.D., & Driessen, M. (2014). It's not about seat time: Blending, flipping, and efficiency in active learning classrooms. *Computers & Education, 78* (2014) 227-236.

[18] Fulton, K. (2012). Upside down and inside out: Flip your classroom to improve student learning. *Learning & Leading with Technology, 39*(8), 12–17.

[19] Herreid, C. F., & Schiller, N. A. (2013). *Case studies and the flipped classroom.* Journal of College Science Teaching 42, (5): 62-66.

[20] Wallace, A. (2014). Social Learning Platforms and the Flipped Classroom. *International Journal of Information and Education Technology, 4*(4), 293-296.

[21] Wagner, Doug, Laforge, Paul & Cripps, Douglas (2013). Lecture Material Retention: a First Trial Report on Flipped Classroom Strategies in Electronic Systems Engineering at the University of Regina. Paper presented at the Canadian Engineering Education Association Conference, Montreal, Canada.

[22] Scardamalia, M., & Bereiter, C. (1994). Computer support for knowledge-building communities. *The Journal of the Learning Sciences, 3*(3), 265-283.

[23] Scardamalia, M., & Bereiter, C. (1993). Technologies for knowledge-building discourse. *Communications of the ACM*, *36*(5), 37–41.