Students' Experiences with Blended Learning Using a Flipped Classroom Approach

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Abstract
Flipped classrooms reflect a specific approach to blended learning in which direct instruction is shifted outside the classroom through the use of digital technologies. Face to face classroom time is rather used for learning activities to provide opportunities for students to apply and engage more deeply with the knowledge acquired from online instructional resources. Given the dearth of research on the use and effectiveness of this new blended learning approach in higher education, there is a need to examine students' experiences in flipped classrooms. A study was thus undertaken using a mixed-methods research design. It involved 15 students enrolled in a 45-hour module of a Bachelor of Education programme designed and implemented using the flipped classroom approach. Half of the module sessions were delivered online and the remaining sessions were delivered face to face. The aim of the study was to explore students' experiences in a flipped classroom. Qualitative and quantitative data were gathered from students' online learning journal, online activity logs and questionnaires. Although it was the first time that the students' were participating in an online learning environment, data analysed from multiple sources indicate that they had more positive learning experiences than negative ones. The study findings contribute to the knowledge base for effective design and implementation of blended learning using a flipped classroom approach. Moreover, they inform practitioners and researchers of some of the factors that need consideration in the use of flipped classrooms with higher education students.

Key Words: Blended learning, Flipped classroom, Students' experiences

Introduction

The idea of a flipped classroom is not new, but recently has been gaining more attention as a result of technological, instructional and pedagogical developments. These developments are largely related to wider Internet access and emerging online technologies. The flipped classroom reflects a specific approach to blended learning. It has also been coined the terms inverted classroom and classroom flip. In a flipped class, the traditional setting of classroom-based learning is inverted, such that face to face direction instruction which involves delivery of content knowledge is shifted outside of formal class time through the use online technologies. Face to face class time is rather used for learning activities that are expected to provide opportunities for students to actively engage in knowledge construction through extensive interactions with peers and the teacher (Bergmann & Sams, 2012; Missildine et al, 2013).

Milman (2012) highlighted that in this approach rather than using valuable class time to introduce or explain a concept, the teacher can create a video lecture, screencast, or even a podcast to teach students the concept. The valuable class time can, thus, be used for more collaborative and engaging activities that are facilitated by the teacher. Besides video lectures, screencasts or podcasts, students can also be provided readings online. The students need to prepare for the face to face sessions by watching the videos, listening to podcasts and reading the assigned articles.

There is evidence from a few studies that the flipped classroom can promote learning to a greater extent than the traditional classroom (Deslauriers et al, 2011; Henderson, et al, 2012; Prober & Heath, 2012; Strayer, 2012). Nonetheless, most of these studies have been conducted for K-12 education. There is, thus, a need for research on flipped classroom in the context of higher education, including qualitative research studies that focus upon on students' learning experiences (Johnson, 2013; Galway et al. 2014; Abeyskera & Dawsin, 2015). Such studies will help in providing a more in-depth understanding of the effectiveness of the flipped classroom approach and subsequently assist teachers in designing more effective flipped classroom.

Another limitation of extant literature on research on flipped classroom in the context of higher education is that most studies involve the use of out-of-class time solely for students to engage with instructional resources such as video lectures, podcasts and readings. Very few studies have included online activities for students to complete during the out-of-class time. Brunsell and Horejsi (2013) pointed out that embedding active and engaging learning activities along with the online instructional resources provide a more complete classroom flip than simply uploading content materials. Moreover, Ash (2011) and Milman (2012) have expressed their concern about using solely video lectures for students to view online as it is not effective in shifting students' learning approach from a passive one to a more active one.

Given the above gaps in the literature, a research was undertaken on blended learning among higher education students using a flipped classroom approach. The flipped classroom involved the use of online activities along with online instructional resources for students to engage with during the out-of-class time. The aim of the study was to explore students' experiences with blended learning using a flipped classroom approach.

Although the flipped classroom approach has been gaining more attention, there is no single agreed definition of the term. Nonetheless, studies involving a flipped classroom approach have a number of common features (Abeysekera & Dawson, 2015):

- A change in use of classroom time;
- A change in use of out-of-class time;
- Activities traditionally considered as in-class work done out of class;
- Activities traditionally considered 'homework' done in class;
- In-class activities emphasise active learning, peer learning, problem-solving;
- Use of technology for content delivery.

Drawing on the literature and the design used for the flipped classroom approach, for the purpose of this study, the flipped classroom was defined as a pedagogical approach that involves:

- A shift of most information-transmission teaching out of class;
- Use of face to face class time for learning activities that are active and collaborative;
- Use of online technology for content delivery; and
- Use of online activities for students to complete out of class to fully benefit from online instructional resources.

Methodology

Study Context

This study was conducted in a teacher education institution (established since 1973) which has recently started offering courses on a blended mode. It involved a group of fifteen female students enrolled in the first semester of their third (final) year of a Bachelor of Education (BEd) programme for secondary school teachers. All the students were practising teachers who already hold a Teacher's Diploma and they are enrolled on a part-time basis in the BEd programme. Face to face classes for courses ran in the late in the afternoon on weekdays and in the morning on Saturdays.

The aim of the selected course was to deepen students' understanding of key research methodology concepts introduced in another research methodology course during the second year of the programme such that students can apply these concepts in their final year research project. Informed written consent to participate in the study was obtained from all students. Moreover, students were informed that their participation in the study would not affect their grades in any way nor the teacher's attitudes towards them. There was only one teacher responsible for the design and delivery of the course and she was one of the researchers.

The course usually runs over 15 weeks of 3-hour weekly sessions. For this study, the course was delivered using a blended mode, such that 7 sessions were delivered online and 8 sessions were delivered face to face. The course design and implementation were guided by the flipped classroom approach. Research shows that it is important for students to understand the essence of the flipped classroom in order to benefit the most from it (Gillboy et al, 2015). Thus, prior to the start of the course,

a 3-hour face to face orientation session was organised to familiarise students with the flipped classroom approach. The session focused mainly on the online learning environment, the structure of the flipped classroom approach, its underlying pedagogical principles and guidelines for the online sessions. Moodle was used as the learning management system (LMS) and hands-on activities were included during the session to familiarise students with the online learning environment.

Several researchers have argued that there is no right or single way to design and implement the flipped classroom provided that the approach reflects a shift of content delivery to outside of formal class time and the use of face to face class time for active and engaging learning activities (Bull et al, 2012; Nolan & Washington, 2013; Galway et al, 2014). In this study, the design of the flipped classroom approach was founded on cognitivism, constructivism and the extant literature.

The design of the course face to face sessions was founded on constructivist principles which lend themselves to knowledge construction through active and joint interactions between students, their peers and the teacber (Harasim, 2012). Learner-centred tasks were used to actively engage students and to give them the opportunity to apply and extend concepts addressed in the online sessions. Most of the activities during the face to face sessions involved group work. The teacher facilitated the group work, addressed students' queries and provided feedback on activities completed in class as well as online activities for which no online feedback had been provided. Opportunities were also provided for peer feedback.

The design of the online sessions were guided mainly by cognitivist principles. Content was delivered through different online resources – video clips, links to web sites, text-based lecture notes and Powerpoint slides. The relevant resources were structured and sequenced taking into account the prior knowledge of the students. In line with previous research findings (Ash, 2011; Milman, 2012; Brunsell & Horejsi 2013), online activities were included along with the online instructional resources to engage students online and to minimise passive learning which is more likely to occur when online sessions are limited to viewing videos or completing readings.

Students were required to attempt ungraded online quizzes to monitor their own learning after having engaged with the online resources. The quizzes provided automated feedback to each student once completed. Students were also required to post their most valuable learning experiences and challenges encountered in an online learning journal. Cognitivists such as Brown and Ferrara (Perry, 1999) recognize ungraded quizzes and learning journals as powerful learning tools to monitor one's learning progress. The role of the teacher was to facilitate discovery of new knowledge by providing the necessary resources and monitoring students online participation to ensure that everyone engaged with the online resources. Reminders were sent to students who had not accessed the relevant resources set for the week.

Research Approach and Design

A mixed-methods research approach was used for this study. It reflects a pragmatic paradigm that is congruent with the researchers' view that research conducted in naturalistic setting should focus on selecting methods for data collection that best address the research questions than selecting methods that draw exclusively from the

qualitative or quantitative research paradigm (Tashakkori & Teddie, 2003). The pragmatic paradigm has emerged in response to the debate that quantitative and qualitative research approaches are mutually exclusive and is based on rejection of the forced choice between the two approaches. It supports a mixed-methods research approach that involves using an eclectic approach to methods of data collection and analysis to answer the research questions rather than restricting researchers' choice (Johnson & Onwuegbuezie, 2004). Different research designs can be used in mixed-methods research (Cresswell & Clark, 2011). In this study, a convergent mixed-method design was used. Quantitative and qualitative data were merged concurrently and compared to gain a more complete understanding of students' learning experiences with blended learning using a flipped classroom approach.

Data Collection and Analysis

Quantitative and qualitative data were collected using different methods. Quantitative data were gathered from close-ended questions in two questionnaires and from online activity logs while qualitative data were obtained from students' online learning journal and open-ended questions in one questionnaire. The use of different methods of data collection allowed for triangulation and complementarity to ensure credibility of the study findings with respect to students' experiences with blended learning using a flipped classroom approach (Johnson & Onwuegbuezie, 2004). Triangulation was an ongoing process that involved the use of multiple data sources and checking for findings from different sources that converge and corroborate (Miles & Huberman, 1994). Complementarity was achieved by seeking elaboration and clarification of quantitative data from the questionnaires and online activity logs with findings from the online learning journal.

Prior to the start of the course, a questionnaire was administered face to face to all study participants to find out about their computer/Internet usage and skills, their previous online learning experiences, and their perceived benefits and challenges to engaging in an online learning environment. A second questionnaire was administered online to all students at the end of the course to gather quantitative data about their learning experiences during the face to face and online sessions, including their perceptions of the instructional resources and activities.

Both questionnaires included mostly close-ended questions; 5-point Likert scale items were used for the online questionnaire. Data collected remained anonymous and were analysed quantitatively in terms of descriptive statistics (frequencies and percentages). The second source of quantitative data was the students' online activity logs. These were accessed from the online learning management system at the end of the course to determine the online participation pattern of students. These logs kept a record of all the activities each student had performed online.

The online learning management system was also used by each student to post (in an online learning journal) their reflections on aspects of the sessions (online and face to face) they found most beneficial and the challenges they faced. The teacher had provided guidelines to students for the online learning journal, highlighting the need to be critical in their reflections and the benefits of such an activity to students and to the tutor. The journal provided qualitative data about students' positive learning

experiences and the challenges they faced, thereby elaborating and clarifying the quantitative data from the online questionnaire.

All data obtained were kept confidential during analysis and reporting. Qualitative data from the online learning journal were copied into MSWord Doc. The data were read and reread to acquire a general sense of patterns and themes. Both inductive and deductive methods of data coding were used. Data were first coded and grouped by preset categories identified from the online questionnaire, namely online experiences with online instructional resources, online activities, face to face activities and overall learning experiences. Within each category, data were then coded through an iterative process for emerging themes. Memos were written throughout the coding and interpretation process aiding in the identification of relevant themes. The eclectic data coding approach allowed for complementarity of qualitative and quantitative data.

Findings

Online learning experiences at the start of the course

Online learning experiences of students at the start of the course were gauged from analysis of data from the face to face questionnaire. Analysis of the questionnaire showed that all students had access to Internet and a PC or laptop at home; they used their PC or lap top at least once every 2 days. Five students reported using their PC or lap top several times a day. Internet was accessed by most of the students (n = 14) at least once every two days. One student reported accessing the Internet less than once weekly, although she does have regular access at home. The students rated their IT skills from fair (n = 5) to good (n = 10).

They were all participating in a course using an online learning environment for the first time. Nonetheless, all of them expressed their interest in engaging in an online course using blended learning as part of their teacher education programme and they anticipated several benefits. Students reported that the use of online sessions to replace some of the face to face sessions would save travel time for them. They felt that they could use this extra time to study at home and conduct online research in connection with the module content.

'It will help to reduce travelling time which can be used for reading'
"I won't have to come so far for the f2f session.'
'I can stay at home and study'
'I will have more time for research work for the module'

Working at home was perceived to allow for more flexibility of time, place and pace of learning; students could work at their own pace during their spare time.

'I can work at my own pace'
'I will be free to work on my own during my spare time'
'More flexible working time at home'
'We can use our own time and work at our own pace when having online sessions'
'The student is free to manage her study and time'

Opportunities for collaboration, including peer exchange of ideas, offered by the flipped classroom approach was another perceived benefit.

'I can share ideas with others'
'I will have ideas and opinions from others on work to be done'
'Online sessions can be more interactive than face to face session'

A few students also reported technology-related benefits as they will be required to use an online learning environment.

'I will develop my ICT skills to study'
'The online session will allow me to have access to new technologies'
'If I encounter any problem in relation to the module content, I can immediately conduct an online search'

While few students reported technology-related benefits, technology-related and technical issues were more commonly reported as challenges.

'If I have Internet connection problems, I will face difficulties with the online sessions'
'Technical issues may crop up'
'I do not feel comfortable using the Internet'
'I do not have very good ICT skills.'
'What to do if there is a power cut?'

Other challenges were related to being exposed to an online mode of delivery and lack of independent learning skills.

'To be online can be difficult'
'I will have to keep pace of my learning'
'I need to have good self-motivation to do my work online'
'I need to find the time for reading and completing the online tasks'
'I don't know if I'll be able to understand and use whatever information is given in the online session'
'I will have to judge the online information on my own'

Learning Experiences with the Flipped Classroom Approach

Learning experiences of students with blended learning using a flipped classroom approach were gauged at the end of the course from analysis of data from the online activity logs, the online questionnaire and students' online learning journals.

Online Participation

The online activity logs revealed that students participated actively online. Over the course of 15 weeks, there was a total of 10, 705 hits from students (student range of 403-1603), that is an average of about 102 hits daily. Students' online presence was also noted for weeks that were delivered face to face. On average, students logged in at least 3 times per week, with the highest online activity on Sundays.

During weekdays, students logged in mostly after 8 pm. Online time was largely spent on viewing and engaging with instructional resources and learning activities.

Experiences with Online Learning Resources

Analysis of the post-course online questionnaire revealed that students' had largely positive experiences with the online instructional resources (see Table 1). All of them felt that the resources were meaningful and useful, and they had devoted much time and effort in engaging with them deeply rather than superficially. They also felt that the resources helped them to better understand the topics and to tackle the face to face activities. The latter were considered to be an important motivator for engagement with the online resources. Most of them were able to keep up with the resources.

Qualitative data from the online learning journal support students' largely positive experiences with the online resources. Students expressed their appreciation about the different types of resources used as illustrated by the extracts from their journals. Resources were found to be interesting, enriching, credible and clear. Moreover, students felt that the resources would help them for completion of their dissertation, a major component of the BEd programme.

'*The topics given online were interesting and will help us in our dissertation.'*

'The video clip given online was very clear.'
'The video clips provided as resources were very interesting and I have viewed them several times and now I think I would be able to identify credible sources of literature and start to plan and prepare my literature review for my dissertation.'

'The information given on websites are important as very often we do not know which are the good ones'

'The resources given were enriching, the information given in stages in research, stepwise points were clear and precise as it will enable me to carry out the literature review part of my case study.'

Table 1. Students' Experiences with Online Resources from Post-Course Questionnaire **(***SD= strongly disagree; D = disagree; N = neither agree nor disagree; A = agree; SA = strongly agree)*

	SD (%)	D (%)	N (%)	A (%)	SA (%)
The content of the online learning resources was meaningful and useful.	0	0	0	8	92
I devoted much time and effort when engaging with the online learning resources.	0	0	0	58	42
After engaging with the online learning resources, I felt more competent to complete the face to face activities.	0	0	0	25	75
After engaging with the online learning resources, I felt more competent about the topic.	0	0	17	33	50
I read all the online learning resources for meaning rather than superficially.	0	0	0	42	58
I was able to keep up with the online learning resources (readings, videos) throughout the module.	0	0	17	33	50
I did not face any technical issues to access the online resources.	8	17	17	50	17
Setting in-class/face to face activities based on the content of the online learning resources was necessary in maintaining my engagement.	0	0	0	33	67
The workload was appropriate for the online resources and activities	0	17	17	50	17

The main challenges reported by students were related to difficulties to accessing the online resources and the workload. Only 67% of students reported that they did not encounter any technical issue to access the technical resources and felt that the workload was appropriate. Poor and unreliable internet connection prevented a few students from readily accessing the online resources.

'Having no internet access to complete my work during week eight has disturbed much of my organization.'

'At times, internet connection was not accessible.'

Some students felt that the workload was too much for the week. They reported in their journals that there were too much to read. For some online sessions, the notes were found to be bulky and students could not understand all the relevant concepts.

'You have sent too much to read for one week! I have tried to complete the reading before coming to class. At times I didn't feel like reading but I forced myself to complete everything as I wanted to feel at ease during the face to face session.'

'During week six there was much reading to be done to get prepared for week seven.'

'Lots of readings. On week 8/9, the notes were bulky. Sometimes, I was confused and lost with different concepts of the research. It took much time to grasp the information.'

Experiences with Online Activities

All the students reported from the online questionnaire that they had very much enjoyed the online activities and they had found the activities relevant and useful with clearly stated instructions and expectations (see Table 2). Most of them (92%) had devoted much time and effort in engaging with the activities. Their positive perceptions of the online activities are supported by statements from their online journals. The online quizzes were found to be interesting and suitable self-assessment tools.

'The quiz given for self-assessment was interesting.'

'The quiz was suitable to check our understanding.'

'The online activity was very enriching as the short answer questions help us to reflect and to recall what i have learnt before during the online session.'

The main challenge was related once more to poor internet connection.

'I have not attempted for the quiz as my internet connection at home was not good.'

'The online database given by tutor was not easily accessible and at times, I was lost while searching information.'

Table 2. Students' Experiences with Online Activities from Post-Course Questionnaire **(***SD= strongly disagree; D = disagree; N = neither agree nor disagree; A = agree; SA = strongly agree)*

	SD (%)	D (%)	N (%)	A (%)	SA (%)
I enjoyed doing the online activities very much.	0	0	0	50	50
The online activities were relevant and useful.	0	0	0	25	75
Expectations and instructions were clearly stated for the online activities	0	0	0	17	83
I devoted much time and effort to engage with the online learning activities.	0	0	8	42	50

Experiences with Face to Face Activities

Students' experiences with the face to face activities were largely positive (see Table 3). All of them enjoyed doing the activities very much and felt that the activities were relevant and useful with clearly stated expectations and instructions. They reported that the face to face activities have deepened their understanding of key concepts and have helped them to feel more competent about the relevant topics.

Although online activities were positively perceived by students, 67% felt that the face to face activities were more interesting. A large majority (75%) stated that they would have preferred to have more face to face sessions. However, the lecture approach was not favoured for the face to face sessions with only 17% reporting that a lecture approach in face to face sessions would have been more useful than engaging with the online learning resources and activities.

Students' positive perceptions of the face to face activities are supported by statements from their online journals. Besides providing opportunities to check one's understanding and clarify misconceptions, students highlighted benefits related to the nature of the face to face tasks which allowed for collaborative work, sharing of ideas and getting peer feedback to be used for self-assessment.

'I found the f2f session i.e the class activities valuable in the sense that it gave me the opportunity to check my understanding and knowledge on the topics.'

'The face to face session was helpful as in group work we could talk to each other and better understand the concepts.'

'There was active participation and sharing of ideas among peers.'

'Being assessed by peers allowed us to accept positive criticism and carry out a self-assessment.'

'Misconceptions were cleared while doing the face to face activities.'

Table 3. Students' Experiences with Face to Face Activities from Post-Course Questionnaire **(***SD= strongly disagree; D = disagree; N = neither agree nor disagree; A = agree; SA = strongly agree)*

	SD (%)	D (%)	N (%)	A (%)	SA (%)
I enjoyed doing the face to face activities very much.	0	0	0	33	67
The face to face activities were more interesting than the online activities.	0	8	33	42	17
Expectations and instructions were clearly stated for the face to face activities/tasks.	0	0	0	25	75
The face to face activities were relevant and useful.	0	0	0	8	92
The workload was appropriate for the face to face activities/tasks.	0	33	0	33	33
After participating in the face to face activities, I felt more competent about the topic	0	0	0	25	75
Engaging with the face to face activities was very helpful in learning the content and deepening my understanding of key concepts.	0	0	0	17	83
I would have preferred to have more face to face sessions.	8	0	17	42	33
Face to face lectures would have been more useful than engaging with the online learning resources and activities.	8	25	50	17	0

The main challenge for the face to face activities was related to the workload as highlighted in the comment below.

'It was sometimes difficult to keep track with the flow of the session as it was too bulky.'

Overall Learning Experiences

Findings from Table 4 support the earlier positive experiences with the flipped classroom. Most of them (84%) are willing to do other courses using the flipped classroom approach. Although most students (91%) enjoyed the new learning experience and felt comfortable with the new ways of learning, analysis of online journal reflections reveal that the flipped classroom approach may not be appropriate for all learners, especially those with poor independent learning skills.

'I was very much motivated to engage myself in an online study environment which is a new strategy of learning'

'Despite having some drawbacks, online learning was as effective as the face to face ones. Time was indeed the major challenge for the online learning.'

'Having part of the course as online sessions was beneficial as we are part-timers and this helped us to manage our time.'

'I need to encourage myself to become an independent learner as I prefer the face to face session to the online session.'

'If I have to evaluate myself after several weeks I will say that I am a very bad independent learner. I prefer to come to the M.I.E weeks after weeks rather than having online session. I feel that I would have preferred more face to face sessions.'

Table 4. Overall Students' Learning Experiences from Post-Course Questionnaire **(***SD= strongly disagree; D = disagree; N = neither agree nor disagree; A = agree; SA = strongly agree)*

	SD (%)	D (%)	N (%)	A (%)	SA (%)
I am willing to do more courses using a flipped classroom approach.	0	0	17	42	42
I enjoyed the new learning experience	0	0	8	33	58
I felt comfortable with the new ways of learning	0	8	0	33	58

Conclusions and Implications

Findings from the online questionnaire and the learning journal reveal that students generally had positive learning experiences with the flipped classroom approach. All students found the online learning resources, online activities and face to face activities relevant and useful. They reported devoting much time outside the classroom to engage with the online learning resources and the activities. The high online participation was supported by the online activity logs.

Students also participated actively in the face to face sessions and some found the activities to be more interesting than the online ones and wished to have had more face to face sessions. Despite students' greater satisfaction with the face to face sessions, most of them expressed their willingness to be engaged in additional courses involving the flipped classroom approach. Moreover, even though it was the first time that students were participating in a blended learning course, most of them felt comfortable with the new ways of learning.

The course design using cognitivist principles to guide the development and implementation of the online sessions and constructivist principles for the face to face sessions can largely account for students' positive learning experiences. The relevance and usefulness of the learning resources and activities (online and face to face) are also key factors contributing to students' positive learning experiences. The study findings support the embedding of online activities in the online (out-of-class) sessions rather than limiting these sessions to video lectures and text-based resources.

Although students had largely positive experiences with the flipped classroom approach, a few challenges were also noted. Poor and unreliable Internet access was a major barrier to engaging online with the learning resources and activities. High workload to engage with the online learning resources was also reported as a challenge. The workload issue was a greater challenge for students who reported having poor independent learning skills. Thus, when designing blended learning courses using a flipped classroom approach, due consideration should be given to students' access to technology, their IT skills as well as their independent learning skills.

In this study a relatively small number of students was involved in the flipped classroom approach. The effectiveness of the flipped classroom with larger groups of students warrants additional research. Moreover, the role of the teacher in the effective implementation of a flipped classroom needs to be further explored. The influence of students' conceptions of teaching and learning (transmissive vs. constructivist) on experiences with flipped classrooms also needs to be given greater consideration in future studies.

References

Abeysekera, L. & Dawson, P. (2015). Motivation and cognitive load in the flipped classroom: Definition, rationale and a call for research. *Higher Education Research & Development*, *34* (1), 1-14.

Ash, K. (2011). Educators view 'Flipped' Model with a more critical eye. *Education Week, 32* (2), 6-8.

Bergmann, J. & Sams, A. (2012). *Flip your classroom: Reach every student in every class every day*. Philadelphia: International Society for Technology in Education.

Perry, M. (1999). The application of individually and socially distributed cognition in workplace studies: Two peas in a pod? *Proceedings of the European Conference on Cognitive Science*, 87-92.

Brunsell, E. & Horejsi, M. (2013). Flipping your classroom in one "take". *The Science Teacher, 80* (3), 8.

Bull, G., Ferster, B., & Kjellstrom, W. (2012). Inventing the flipped classroom. *Learning & Leading with Technology*, *40* (1), 10- 11.

Cresswell, J.W., & Clark, V.L.P. (2011). *Designing and conducting mixed methods research*. Los Angeles, CA: Sage.

Deslauriers, L., Schelew, E., & Wieman, C. (2011). Improved learning in a large-enrollment physics class. *Science*, *332* (6), 862-864.

Galway L. P., Corbett, K. K., Takaro, T. K., Tairyan K., & Frank, E. (2014) A novel integration of online and flipped classroom instructional models in public health higher education. *BMC Medical Education (14),* 181-192.

Gilboy, M. B., Heinerichs, S. & Pazzaglia, G. (2015). Enhancing student engagement using the flipped classroom. *Journal of Nutrition Education and Behavior*, *47* (1), 109-114.

Harasim, L. (2012) *Learning theory and online technologies* (First ed.). New York: Taylor and Francis Group.

Johnson, G. B. (2013). Student perceptions of the flipped classroom. (Unpublished master's thesis). University of British Columbia, Vancouver. Retrieved from https://circle.ubc.ca/handle/2429/44070 (Accessed on 23 February 2015).

Johnson, R. B. & Onwuegbuezie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, *33* (7), 14-26.

Miles, M. B. & Huberman A.M. (1994). *Qualitative data analysis: An expanded sourcebook*. Beverly Hills, CA: Sage.

Milman, N. B. (2012). The flipped classroom strategy: What is it and how can it best be used? *Distance Education, 9* (3), 85-87.

Missildine, K., Fountain, R., Summers, L. & Gosselin, K. (2013). Flipping the classroom to improve student performance and satisfaction. *Journal of Nursing Education*, 52 (10), 597-599.

Prober, C. G., & Heath, C. (2012) Lecture halls without lectures: A proposal for medical education. *New England Journal of Medicine, 366* (18), 1657-1659.

Strayer, J. (2012). How learning in an inverted classroom influences cooperation, innovation and task orientation. *Learning Environments Research, 15* (2), 171-193.

Tashakkori, A. & Teddlie, C. (2003) *Handbook of mixed methods in social and behavioural research*. Thousand Oaks, CA: Sage

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