

An Assessment of Hybrid Collaborative Learning in Geography Micro-teaching: A South African Case Study

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ABSTRACT This paper explores how the implementation of a particular hybrid collaborative learning design (classroom-based and web-based), in Geography micro-teaching, can assist student teachers in the planning and presenting of learner-centred micro-lessons. In this one-shot experimental case study a mixed method approach that involved the gathering and analysis of both qualitative and quantitative data was used. Data were collected via questionnaires (n=15), structured focus group interviews (n=6), learning journal entries (n=15) and a comparison of student teachers' teaching and learning activities implemented in micro-lessons over the four-week period. Findings from the study indicate that student teachers view the implementation of hybrid collaborative learning during micro-teaching sessions as a positive learning experience. The hybrid collaborative learning environment in micro-teaching created opportunities and facilitated experiences that developed student teachers' capacity to reflect on their own and fellow students' practices in micro-teaching. Students' micro-lessons posted on "VideoANT" provide evidence that the new learning environment in micro-teaching supports and assists students in the effective planning, design and implementation of learner-centred instruction of Geography micro-lessons.

INTRODUCTION

The education policies of South Africa supported the move from teacher-centred to learner-centred instruction, in schools and at all Higher Education Institutions (South Africa 2003, 2011; Skosana and Monyai 2013). After many years of Outcomes-based Education in South African classrooms, it is natural to assume that teachers are by now proficient in the implementation of learner-centred instructional approaches and methods. However, research indicates the contrary; it seems that teacher-centred instruction is still dominant in most South African classrooms (Alexander et al. 2010; Van Wyk 2012; Warnich and Meyer 2013). The main reason for this is that most teachers were taught in a traditional teacher-centred environment at school and even at university level. It is therefore necessary for tertiary institutions concerned with teacher training, in South Africa to implement strategies to assist student teachers in instructional practice transformation.

Lim and Chan (2007) point out that it is a challenge to effectively shift student teachers away from traditional instructional beliefs towards constructivist thinking. Muijs and Reynolds (2002) emphasize that belief systems are

dynamic mental structures susceptible to change by practical experiences. This implies that student teachers who engage in socio-constructivist learning activities, or observe the implementation of learner-centred instructional strategies, are more likely to change their traditional pedagogical beliefs and adopt the socio-constructivist approach as their own. It is therefore necessary to actively involve student teachers in learning environments which stress learner-centred instruction (Skosana and Monyai 2013; Awases 2015). Frick et al. (2010) further state that in these learning environments teacher educators need to create opportunities and facilitate experiences that will develop the student teacher's capacity to reflect on his or her practice. In this regard Bilén (2015) highlights that the implementation of micro-teaching in teacher education, can assist student teachers in the effective presentation of micro-lessons and the use of various teaching and learning strategies and methods. It is against this background that a study was conducted in a South African context, whereby a particularly hybrid collaborative learning (classroom-based and web-based) environment design was incorporated during micro-teaching sessions in Geography education, to assist student teachers in the planning and

presentation of learner-centred micro-lessons.

Research Objectives

The objectives of this study were to determine:

- Geography student teachers' perceptions of and experiences with this particular hybrid collaborative learning design in Geography micro-teaching;
- Whether student teachers' instructional approaches shifted from being teacher- to learner-centred, during micro-lesson presentations, over the four-week research period.
- Design changes that can improve the effectiveness of the hybrid collaborative learning design in Geography micro-teaching.

Micro-teaching

Micro-teaching originated in the United States in the 1960s (Grossman 2005). It is described as a scaled-down, simulated teaching encounter designed for the training of student teachers. Kilic (2010) as well as Saban and Çoklar (2013) are of the opinion that micro-teaching can assist student teachers in preparing lessons, set lesson objectives, and develop and implement various teaching, learning and assessment strategies and methods. Amobi (2005), Bilen (2015) and Meng (2014) indicate that students view micro-teaching to be a useful and enriching training tool.

From literature it is evident that micro-teaching designed on the principles of socio-constructivism and meaningful interaction should include internal and social negotiation, appropriate responses to certain triggers, argumentative dialogue, contributions towards evolving ideas and the offering of alternative perspectives while solving real tasks (Lapadat 2002). Meng (2014) emphasises that when entering into dialogue with students regarding micro-teaching lesson presentations, teacher educators and peers should reflect on whether student teachers have achieved the prescribed lesson aims and objectives, during the micro-lesson presentation. The feedback must give student teachers suggestions on how to improve the implementation of their teaching and learning strategies and methods. Darling-Hammond et al. (2005: 412) recommend that "students develop an analytic framework to assess the micro-teaching

performances of their peers". The assessment and feedback of student teachers' lesson presentations during micro-teaching correspond with Lim and Chan's (2007: 474) view that "to critically examine or reflect on the strengths and limitations of each approach may restructure students' existing beliefs and encourage them to adopt new instructional practices that are consistent with their pedagogical beliefs". Zaidi (2015) highlights that micro-teaching can assist student teachers to focus more on learner-centred instruction and less on didactic, teacher-centred instruction.

The traditional micro-teaching has experienced innovative changes with the development of new technologies. The use of technology, and specifically video technologies, has assisted in the effective training of student teachers (Hattie 2009). Thomas (2013) as well as Van der Westhuizen and Golightly (2015) are of the opinion that the integration of technology in teacher education, with specific reference to micro-teaching, can create greater opportunities for students to reflect on their own and fellow students' micro-lessons.

Hybrid Collaborative Learning in Teacher Education

Fernandez and Robinson (2006) highlight the importance of collaboration among student teachers when planning and presenting micro-teaching lessons and then reflecting thereon. Successful collaboration, according to Strijbos et al. (2004), requires the careful design of the learning environment for group interaction and the provision of scaffolding, leadership and support by the facilitator to promote students' understanding. Ravindra (2015) defines collaborative learning as working with others to learn something together. Collaborative learning therefore is a process that encourages constructive discussion of ideas, argumentation and dialogue among student teachers. In recent literature two types of collaborative learning were identified, namely classroom-based and web-based collaborative learning (Jia 2005; Strijbos and Fisher 2007). In reference to micro-teaching Ravindra (2015) points out that optimum collaborative learning performance occurs where classroom-based and web-based collaborative learning are integrated; in other words, within a hybrid collaborative learning environment.

Classroom-based collaborative learning is adopted in a classroom environment where face-to-face interaction is recognised as the main interactive style between instructor-student and student-student, in order to produce optimal resolutions for learning problems (Jia 2005). Learning is thus a social activity where peers play an important role in encouraging learning. In recent years, many researchers have adopted technology (computers, Internet or online technology) as a key feature to engage students in web-based collaborative learning (McInnerney and Roberts 2004). According to Ma (2009: 145), web-based collaborative learning can improve the “quantity and quality of social interaction amongst students and between educators and students, as these tools make the sequence of interactive behaviours more visible to participants, improving the possibilities for mutual understanding”. In web-based learning environments students are interacting through the Internet. Internet communication tools such as e-mail, video, audio systems, virtual seminar and bulletin boards allow students to exchange information, contribute to discussions and examine alternative perspectives. Students can communicate interactively on a one-to-one basis or in groups, enabling opportunities for collaboration (Hong et al. 2001).

The available open platforms in support of users’ interaction and participation, Web 2.0 technologies enable collaborative learning as well as knowledge dissemination and sharing to add a new learning dimension in traditional classroom settings and supplement traditional instructional methods. In particular, Web 2.0 technologies support “any time, any place” learning and may produce powerful learning experiences when they serve as cognitive reflection and amplification tools. These assist the users to establish meaning through the act of self-design of knowledge databases (Boulos et al. 2006).

In teacher training, with special reference to micro-teaching, the development of new technologies assists Higher Education institutions with the implementation of collaborative learning environments. The effective use of video-based pedagogy has been shown to be enhanced through the use of web-based environments. Students and teachers can access various hyperlinked video cases associated with textual description, teacher reflections and expert analysis (Williams et al. 2001) and they can

also participate in web-based dialogues with peers to improve reflective practices (Steve and Weisner 2004). The sharing of micro-teaching videos through online community technology also facilitates collaborative learning among community members, exposing student teachers to the various teaching and learning perspectives of their peers. Darling-Hammond (2006) concurs when she states that students participating in collaborative learning activities contribute to one another’s learning, as members of a professional community.

Recent developments in video annotation tools make video reflection increasingly viable and accessible and offer the potential to support both reflection and analysis of one’s own teaching (Van der Westhuizen and Golightly 2015). Santagata and Guarino (2010) underline the use of video annotation as a way to strengthen student teachers’ ability to learn about their own teaching. These tools provide potentially important methods for scrutinizing instructional decisions within a specific context (Stevens 2007). According to Rich and Hannafin (2009), video analysis programmes such as Transana™ (www.transana.org), DIVER™ (diver.stanford.edu), Constellations™ (orion.njit.edu), StudioCODE and VideoANT; provide significant data-mining capabilities, management and fine-grained analysis and reporting opportunities. They also mention other video-annotation tools with different functions, namely VAST, VITAL, the VAT, VideoTraces, VideoPaper, MediaNotes, and StudioCode.

For the purpose of this study, “VideoANT” as an example of a Web 2.0 application tool designed by Hosack et al. (2009) to create text-based annotations integrated within online video timeline, was implemented during Geography micro-teaching sessions. This application allows students to tag a portion of a video where they wish to make a comment or give feedback on the video. It allows users to make time-line based textual comments in synchronization with online video. It is ideal for peer assessment and providing feedback or facilitating peer reviews. VideoANT can also assist students within a collaborative learning environment to reflect on fellow students’ micro-lessons.

METHODOLOGY

The participants in this one-shot experimental case study (Leedy and Ormrod 2003) con-

sisted of student-teachers in two of the teacher training programmes at a university in South Africa. The Faculty of Education Sciences at this particular university offers both a four-year Bachelor of Education Degree (B.Ed.) and a one-year Post Graduate Certificate in Education (PGCE) which prepare candidates to teach in one of the following educational phases: Foundation (Grades R-3), Intermediate (Grades 4-6), Senior (Grades 7-9) and Further Education and Training (FET) (Grades 10-12).

Participants

All 15 Geography student teachers ($n=15$), eleven ($n=11$) in their fourth year of the B.Ed. and four ($n=4$) PGCE candidates, registered for the Geography Subject didactic modules. The population consisted of 11 male and four female students. As the entire class (population) formed the research sample, the uneven distribution of male and female participants was regarded as acceptable for the purpose of the study. This sample size correlates with the sample size applied for micro-teaching research in literature (T'Anson et al. 2003; Scheeler et al. 2006).

A Particular Hybrid Collaborative Learning Design in Geography Micro-teaching

In the Geography didactic modules of the fourth year of the B.Ed. and in the PGCE, there are three scheduled contact sessions per week (One contact session = 50 minutes). In the past, two of these contact sessions were used for the study of theory and the third contact session for micro-teaching. With the integration of this particular hybrid collaborative learning environment in micro-teaching, the theory was completed during the first five weeks (all three periods per week) of the semester, while all scheduled contact sessions during the last four weeks of the semester were dedicated to micro-teaching. During the theoretical sessions the focus was on the different teaching and learning theories, strategies, methods and teaching aids, as well as on assessment strategies appropriate for Geography education. The students also had to plan and design learner-centred instructional lessons, embedded in the socio-constructivist approach (cf. Jonassen 1999).

The lecture halls used for the presentation of the micro-lessons during micro-teaching ses-

sions are designed and organised to resemble a normal school classroom, complete with a black board, projector and computer with access to PowerPoint and Internet. During lesson presentations it is expected of student teachers to make use of teaching aids such as; PowerPoint, transparencies, worksheets, posters and models.

For the purposes of the study, the students grouped themselves into three groups of four and a fourth group consisting of three members. It is important to mention that one of the groups consisted of only male candidates. A time-table was provided with dates of recording sessions of each group's micro-lesson, as well as the time-slots allocated to the assessment and moderation sessions of the different groups' micro-lessons on the web. Students regularly received e-mails to remind them whenever the videos were uploaded on the web for assessment and moderation. The Geography lecturers acted as facilitators and recorded the student teachers' micro-lesson presentations.

For purposes of lesson presentations during micro-teaching sessions for this study, the Geography student teachers had to select appropriate themes for a specific school phase as prescribed in the South African National Curriculum Statements and the new Curriculum Assessment Policy Statements for Geography (South Africa 2011). The purpose of these micro-teaching sessions was to ensure that the student teachers practised the implementation of learner-centred instructional strategies activities. This was to learn how to actively involve the learners in the learning process and promote communication and collaboration among learners in the classroom. To support the student teachers in the delivery of comment and feedback on fellow-students' micro-lessons, the group members had to complete the micro-lesson assessment form together (See Fig. 1).

With the implementation of the hybrid collaborative learning environment, the facilitators clearly specified the academic tasks the student teachers had to perform and explained the hybrid collaborative structures (See Fig. 2). Student teachers were requested to listen to comments from each member of the group carefully and be willing to reconsider their own judgments and opinions where appropriate. It was therefore emphasized that every group member had to be afforded an opportunity to contribute his/her ideas. After a collaborative discussion,

Name of assessor _____
 Group: _____
 Name of presenter: _____
 Date: _____

The following aspects have to receive attention during the assessment of the micro-lesson:
 Use the following scale: 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 = agree strongly.

Different aspects that need to be assessed:	1	2	3	4	5
The lesson outcomes were formulated correctly (measurable verbs were used).	1	2	3	4	5
The introduction was original and creative.	1	2	3	4	5
The teaching and learning activities addressed the lesson outcomes.	1	2	3	4	5
Teaching/learning methods supported a learner-centered teaching approach.	1	2	3	4	5
Assessment during the micro-lesson helps to promote learning.	1	2	3	4	5
Different assessment strategies and methods were used.	1	2	3	4	5
The assessment agents (teacher, peer or self) were alternated well.	1	2	3	4	5
Different resources were used effectively during the micro-lesson.	1	2	3	4	5
The Geography learning contents (facts, statements, conclusions) were imparted correctly to learners.	1	2	3	4	5
Time management during the micro lesson was very good.	1	2	3	4	5
TOTAL					50

General comments:

Fig. 1. Micro-lesson assessment form

the group had to formulate recommendations for possible improvement of the specific micro-lesson.

Furthermore, since the classroom-based collaborative learning environment in this study specified that every group member had to plan and present a learner-centred micro-lesson, all group members were expected to assist the presenter in the planning phase. The presenter had to incorporate meaningful suggestions from group members into his/her micro-lesson. Every week a different group member planned and presented a micro-lesson with the other group members acting as classroom learners, during the presentation. Every micro-lesson was video-recorded by one of the facilitators.

After recording the micro-lesson presentation on a digital video camera, it was converted with applicable software to a flash video format (.flv) so that it could be uploaded and annotated in VideoANT. The VideoANT programme was then embedded in the university’s learning management system (LMS), Efundu, from where it could be accessed, operated and managed. A website for each group was created on Efundu from where they could monitor the assessments

of their own lessons, and assess and moderate the lessons of other groups as uploaded weekly by the facilitators. Only the group members and their facilitators had access to their specific website (See Fig. 2).

Before Group B (See Fig. 2) could comment on Group A’s recorded lesson presentation on the web, every member of Group B had to complete an individual lesson assessment rubric while viewing Group A’s presentation on VideoANT. The main objective of the assessment rubric was to support the group members assessing the micro-lesson. After completion of the rubric the group had to provide meaningful written constructive commentary and feedback via VideoANT. Group members were encouraged to specifically peer assess the learner centeredness of the presentation, and to make commendations as well as recommendations for improvement.

After a two-day period had elapsed, the website manager (facilitator) disconnected the video from Group B’s website and uploaded it onto Group C’s website for comments on and/or moderation of the feedback provided by Group B. Group C had to indicate whether they agreed

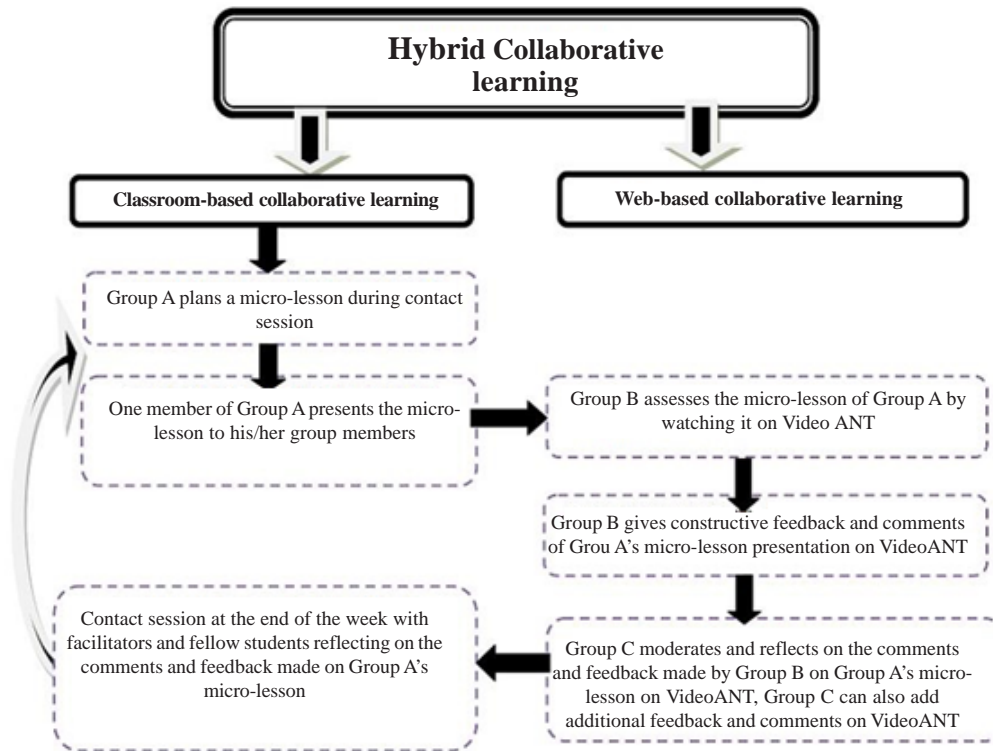


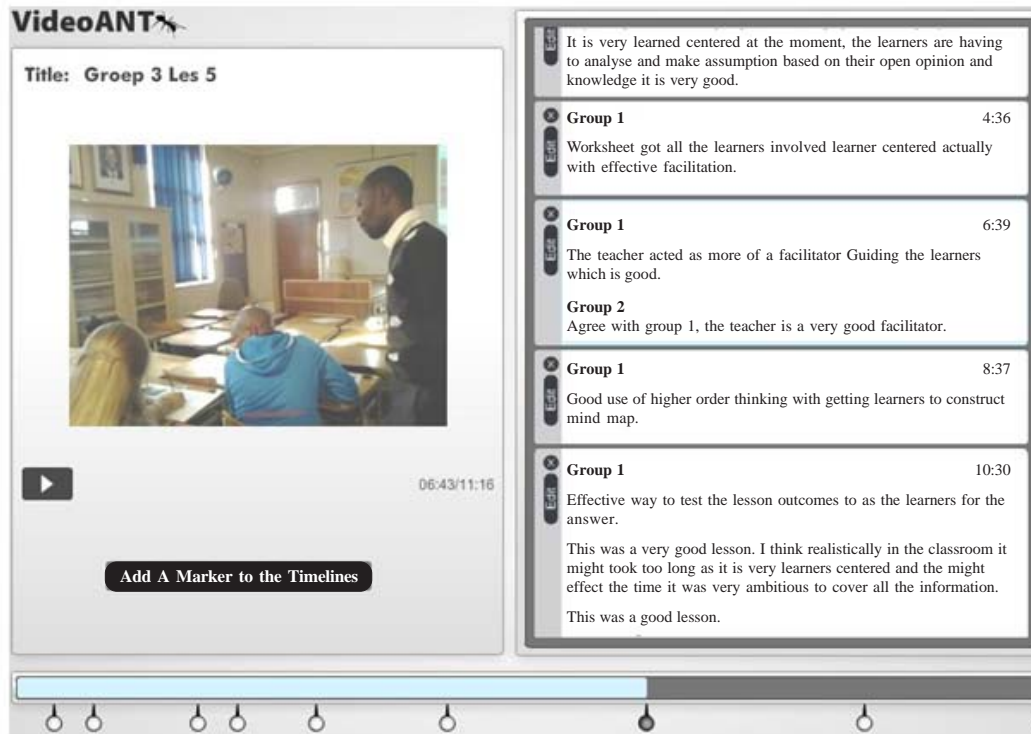
Fig. 2. A hybrid collaborative learning environment in Geography microteaching

with Group B's commentary and feedback on Group A's presentation. Where necessary, Group C could also upload additional time-line based textual comments and feedback on VideoANT. The different group comments were distinguished via the mentioning of a distinctive group number in the commentary box (See Fig. 3). Every week a different group was responsible for assessment and moderation of the group presentations. Although every group could follow the commentary and feedback of the other group presentations on the web, access to write commentary on a presentation was only allowed to the two groups respectively responsible for the assessment and the moderation of the lesson presentation. Ultimately the presenting group compiled a reflective report with a summary of the benefits of the assessment of the lesson presentation, and an indication of how the commentary and feedback would feature in a follow-up micro-lesson presentation (Refer to Fig. 2).

At the end of each week the facilitator utilised the two-hour contact session for an in-depth classroom-based collaborative discussion, on the commentaries and feedback of the different groups, on the different group presentations. The facilitators were mainly responsible for facilitation of discussions among students with regard to the analysis of the lesson presentations, as well as the critique and the suggestions pertaining to how to present a more learner-centred lesson. The presenter of the micro-lesson and his/her group were afforded the opportunity to defend their instructional approach, style and lesson activities as applied during the specific micro-lesson. The facilitator used the lesson presentations and written lesson planning to compile an assessment mark for the group.

Data Collection and Analysis

A mixed-method approach that involved the gathering and analysis of both qualitative and



Translation of words on the VideoANT screen

The words "Groep 3 Les 5" can be translated into "Group 3 Lesson 5" (*Heading is in Afrikaans, one of the official languages in South Africa*)

Comment box in VideoANT

In the "comment box" in VideoANT a group had to comment on another group's micro-lesson presentation. The precise words of the group were indicated in the comment box. The authors are aware that spelling mistakes etc. might occur in these comments, as English is not the home language of most of the students.

Fig. 3. An example of a print screen of VideoANT

quantitative data was used (Cresswell 2003). The researcher employed the following qualitative and quantitative data gathering methods:

- A descriptive research approach where data were gathered using a structured 30-item questionnaire developed by the authors. The first step in the construction of the questionnaire was an extensive review of literature and the identification of key concepts. The questionnaire gathered information on students' perceptions and experiences of classroom-based collaborative learning (20 items) and web-based collaborative learning (10 items) of this particular hybrid collaborative learning design. The responses were rated on a five point Likert

scale ranging from strongly disagree to strongly agree. This small sample size makes it impossible to calculate the reliability and validity of the questionnaire.

- The qualitative data collected in the focus group interviews consisted firstly of tape-recorded group discussions, held by six student teachers from the different groups who shared their thoughts and experiences regarding the implementation of the specific hybrid collaborative learning in micro-teaching. Secondly it contained personal reflections and opinions in their learning journals regarding the benefits of such an implementation. The data, consisting of these transcribed focus group interviews and jour-

nal entries, were analysed using a thematic analysis. The transcripts of the focus group interviews were read and initially coded according to the prescribed themes, namely students' experiences of classroom-based and web-based collaborative learning. Trustworthiness was enhanced by independent reading and coding by a fellow Geography lecturer. The summaries of the semi-structured interviews were sent to the student tutors for participant verification.

- Students' micro-lessons were posted on VideoANT to provide evidence, if any, of a shift from teacher-centred to more learner-centred instruction, during lesson presentations.

Ethical Considerations

The participants had to give written consent before the recordings could be uploaded on to the web. Furthermore, an undertaking was signed by all involved to ensure that the recordings would not be used illegally, or for any other reason than the original intent. The investigation complied with all the ethical regulations of the university under whose auspices the research was conducted. Participation was free and voluntary, and any participant could withdraw at any time.

RESULTS AND DISCUSSION

Perceptions of the Value of Hybrid Collaborative Learning in Micro-teaching

All members of the study population perceived hybrid collaborative learning to be a positive and valuable learning experience. Participants identified the effective alternation between classroom-based and web-based collaborative learning as beneficial, in terms of the contribution thereof to the planning and presentation of more learner-centred instruction in the Geography micro-lessons. The questionnaire provided for the student teachers to indicate their perceptions of the hybrid collaborative learning environment at the beginning as well as at the conclusion of the study.

After the first week, the majority of the candidates were moderately positive (n=6) to positive (n=5) with regard to implementation of the hybrid collaborative learning design. After a four-week period the perceptions of the students

regarding this matter advanced to positive (n=6) and very positive (n=9). The following entry by one of the participants in his learning journal summarises the positive perceptions of the candidates: "*The hybrid collaborative learning environment in micro-teaching is an excellent and meaningful way to assist groups in planning and presentation of learner-centred instruction in micro-teaching. It was in my opinion more valuable than the weeks spent at schools for practical teaching.*" (Participant A). This is a very important observation, as Mayer-Smith and Mitchell (1997) indicate that the perceptions of students regarding certain aspects of teaching and learning can only be changed if students are gradually exposed to a new approach or concept. Positive perceptions of collaborative learning are important to help change the students' conceptual beliefs regarding the teaching and learning of Geography. In the hybrid collaborative learning environment in Geography micro-teaching, student teachers are exposed to a totally new learning environment. They are expected to support one another in the planning and presentation of micro-lessons, after which the students also assess fellow students' micro-lessons. The inputs by group members as well as the feedback and commentary from other groups and the facilitators assist with the planning and presentation of better learner-centred micro-lessons in group context. In this learning environment Geography student teachers are expected to integrate the theory they learned in the Geography didactic modules with the practical implementation of learner-centred instruction. These findings concur with Neo's (2007: 151) view that collaborative learning environments "allow students to develop multiple perspectives where some type of shared reality is produced. The participants' positive perceptions of the hybrid collaborative learning environment in this study support Ravindra's (2015) recommendation that web-based and classroom-based collaborative learning should be integrated.

In the following sections participants' perceptions regarding the value of the different aspects associated with classroom-based and web-based collaborative learning are discussed.

Classroom-based Collaborative Learning in Geography Micro-teaching

All the participants (n=15) held positive views on the use of classroom-based collaborative learning in micro-teaching. Items in the ques-

tionnaire that the majority of participants totally agreed on in terms of their contribution towards teaching and learning include: *“Feedback on lesson presentations from facilitators and fellow-students during contact sessions improved students’ collaborative skills”* (n=10), *“Collaborative learning improved the social skills of the students”* (n=9), *“The implementation of collaborative learning contributed towards students’ positive attitudes regarding learner-centred instructional approaches”* (n=9) and *“In group context it is easier to deliver constructive criticism and commentary on a fellow-student’s lesson presentation”* (n=9).

The value of collaboration and input from group members within the classroom-based collaborative learning environment was highlighted during the focus group interviews: *“My group members’ input in the planning of my micro-lesson definitely contributed to the quality of learner centeredness of my lesson presentation”* (Participant F). Some of the group members even indicated that they practised the presentation of their lessons in group context before the video recording thereof: *“With the practice of my micro-lesson my group members were encouraged to give their input in order to improve my lesson presentation”* (Participant D). These findings support those of Sawyer (2006) who emphasizes that interacting groups can also provide feedback, support and monitor one another’s work. In this regard Thomas (2013, 152) states that *“reflective thinking is essential to identifying, analysing and solving the complex problems that characterize 21st century classroom teaching”*. Classroom-based collaborative learning in micro-teaching offers a space in which group members can plan and reflect face-to-face on their own and fellow group members’ micro-lessons to help improve their learner-centred micro-lessons.

During the contact session at the end of the week, the facilitators and other groups also had the opportunity to reflect and comment on the different groups’ micro-lessons. The following journal entry emphasizes the value of the contact session between facilitator and all the groups at the end of the week (See Fig. 2): *“In my opinion the contact session at the end of the week is the most important link to ensure effective cohesion of all that was learnt within the hybrid collaborative learning environment. During these contact sessions the facilitators and some*

groups who saw the micro-lesson for the first time, could also reflect and comment on the different groups’ assessment and moderation of the various micro-lessons”. This remark by the respondent regarding classroom-based collaborative learning supports the view of Krajcik et al. (1994, 490) that *“teachers construct their knowledge through social interaction with peers, through applying ideas in practice, and through reflection and modification of ideas”*.

Web-based Collaborative Learning in Geography Micro-teaching

From the findings of this study it is evident that the majority of the participants were positive regarding the implementation of web-based collaborative learning. The participants strongly agreed on the following four items: *“The commentary and feedback from fellow-students on VideoANT contributed towards the improvement of my instructional skills”* (n=10); *“The integration of technology in the micro-lessons improved collaboration amongst group members”* (n=9); *“VideoANT made it possible for students to easily review parts of the recorded lesson presentations which made commentary and feedback all the more meaningful”* (n=9); and *“Viewing my own and other students’ presentations on VideoANT improved my teaching and learning skills”* (n=8).

The journal entries of most of the participants confirm the value of group commentary and feedback on VideoANT as a web-based tool, to improve their teaching and learning practice. The following journal entries specifically support this statement: *“Whenever our group assessed or moderated the micro-lesson of one of the other groups and was uncertain regarding a teaching or learning activity, we could quickly and easily access VideoANT and rewind to the particular part of the presentation. This factor definitely encouraged communication and group discussion amongst group members”* (Participant N); *“Micro-lessons on VideoANT can be assessed and moderated any time, any place”* (Participant B); and *“Monitoring of comments and feedback of groups parallel to the micro-lesson on VideoANT necessitated that commentary be concrete and to the point. In this regard the micro-lesson assessment form assists us in giving meaningful feedback to other groups’ micro-lessons”* (Participant C).

The above-mentioned findings correlate with certain findings in literature, for instance Fernandez and Robinson (2006) who emphasize that students view collaboration as a highly important learning tool in micro-lessons. Tripp and Rich (2012) highlight the effectiveness of using video as a reflective tool, while Wu and Kao (2008) state that student teachers are usually satisfied with the peer assessment activities supported by the streaming video system and that the mark video feature is useful in providing more specific comments about peers' teaching. These findings support the suggestion of Jonassen et al. (2003) that technology should be a partner in the teaching and learning process and will engage and support reflective thinking. The findings also concur with Charteris and Smardon (2013: 168) who report that using video annotation to have a "second look, second think" allows student teachers to "think further and more deeply on their learning dialogue, affording additional insights". In this regard Colasante (2011) emphasizes that students appreciate the ability to analyse their videos of teaching, while Van der Westhuizen (2015) points out that VideoANT assist students to reflect more thoroughly on their own and peers' micro-lessons.

During the focus group interviews the participants indicated that they often visited the web during the week to see the feedback and commentary on their micro-lessons. Participant C pointed out: *"As a group we could not wait to view the commentary and feedback from the other groups on our lesson presentations. We evaluated those comments and discussed whether we agreed with the feedback or not"*. In this case, the web-based technology definitely encouraged the groups to reflect on their lesson presentations and to evaluate other groups' commentary. It also increased social interaction and reflection amongst group members and stimulated critical thinking. VideoANT provided excellent opportunities for interaction among group members and the different groups that would have been hard to achieve without the technology. The implementation of VideoANT in micro-teaching supports the findings of Harford and MacRuair (2008) that peer interaction is important in scaffolding the reflective process. VideoANT, according to Van der Westhuizen (2015), increases reflection, feedback and assessment opportunities by students. Some of the groups' reflection, comments and feedback on

the micro-lessons quoted on VideoANT's commentary block include:

- *"In a cooperative learning environment you as a teacher have to facilitate the learning process among learners. Use the asking of questions to guide learners, but do not provide the learners with the answers."*
- *"The assignment given to learners is not clearly formulated. In the learner-centred approach it is important that learners know precisely what is expected of them. Provide the assessment criteria which will be used to assess the assignment, with the assignment."*
- *"The learners may also be involved in the assessment of their own or fellow-students' assignments. The assessing agent in the classroom could therefore be alternated more."*
- *"Do not use only the question-and-answer method in your lesson. Alternate with other teaching methods, for example when dealing with the push and pull factors in rural to urban migration a debate can be used effectively as teaching method. Learners are not given the information, but are challenged to make their own discoveries and to defend their points of view."*

From the above reflections and commentaries by the different groups on VideoANT, it is clear that they submitted critical assessments of the groups' implementation of learner-centred instruction during the micro-lessons. In this regard VideoANT is a valuable tool for thoughtful and critical reflection among the different groups on each other's' micro-lessons. The text-based annotations integrated within online video-timeline on VideoANT allow students to tag a portion of a video where they wish to make a comment or give feedback on the video. Group members know precisely where and what other group members suggest on the video to improve their micro-lessons (Refer to Fig. 2). However, it is important for the facilitators to provide feedback to student teachers on their assessment and moderation of fellow students' micro-lessons. Furthermore, the learning conversation among fellow students and facilitator enabled the student teachers to construct their own feedback utilising primary data, rather than receiving feedback through the lens of another. In doing so they de-stabilise the traditional power relation-

ship between giver and receiver of feedback (Charteris and Smardon 2013).

According to Ismail (2011), the use of reflection strategies in the web-based collaborative learning provides student teachers with the opportunities to implement effective teaching and learning strategies. So (2009) states that the sharing of micro-teaching videos in an online community facilitates collaborative learning among student teachers, allowing them to collect views from different perspectives by peers. Providing comments on fellow students' micro-lessons and receiving comments on one's own micro-lesson is important in teacher education.

Difficulties and Frustrations in the Hybrid Collaborative Learning Design for Micro-teaching

From the responses to the classroom-based and web-based section in the questionnaire it is evident that some participants' opinions are less positive regarding two main issues of this particular hybrid collaborative learning design: a) The time issue: *"To find time in our busy schedules for collaboration that suited all group members was mostly challenging"* (n=10); and b) Conflict: *"Certain group members didn't carry their weight but expected of other group members to do most of the work"* (n=5); and *"At times there was conflict evident amongst some of the group members (n=4)"*.

The first of these issues was the time factor that was also highlighted by some participants in the focus group interviews and in their learning journal entries. Participant B effectively summarises this problem: *"It was really difficult to find a time for collaboration during the week that suited all the group members. The main reason for this was the fact that all group members had many scheduled classes during the day and most of them were involved with organised student activities after scheduled class hours"*. As with the findings of the classroom-based collaborative learning, some of the participants indicated during the focus group interviews that web-based collaborative learning is not without challenges, for example: *"Not all my group members have internet access at their homes, therefore they had to be on campus in the classroom or the library in order to view the micro-lesson presentations on the web. It was no easy task to find a suitable time or place*

for such an exercise" (Participant N). As internet access in South Africa improves, this problem will also be solved. In this regard, Muuro et al. (2014) also report on the diversity of infrastructure availability, with reference to internet access and computer-mediated tools, in different Higher Institutions in various countries world-wide. Capdeferro and Romero (2012) state that imbalances in the level of commitment, responsibility, and efforts are problems students experience in web-based collaborative learning environments.

During the focus group interviews, some of the participants indicated that viewing the presentations and writing group commentary on VideoANT was also time-consuming. Participant L wrote as follows: *"The discussions amongst group members when commenting on a group's micro-lesson presentation on VideoANT definitely took a lot of time. First the group had to watch the video, and then they had to discuss the presentation and only then write their opinions and commentary on VideoANT. When group members differed in opinion, there was usually a debate and the video had to be replayed until consensus was reached."* This is similar to the findings of Wu and Kao (2008) who emphasize that students find it time-consuming to watch teaching videos of peers and difficult to arrange time to meet and complete group tasks. However, it is important to point out that the discussions and reflection between group members provide opportunities to engage in pedagogical reasoning that according to Youngs and Bird (2010), would help students move toward mastery of teaching.

The second issue identified by the participants was conflict amongst some group members. One of the groups, consisting only of male students, experienced more conflict than the mixed gender groups. In the focus group interviews one of the participants from this specific group stated as follows: *"Some of the group members of my group did not contribute to the discussions and were also not willing to listen to other group members' opinions"* (Participant I). Another member of this specific group entered the following in his learning journal which clearly indicates his dissatisfaction: *"When group members don't contribute and carry their weight, it reflects badly on the whole group"*. It is understandable that some of the participants reacted in this manner, since Payne and

Monk-Turner (2006) state that students are often inexperienced in working collaboratively, have difficulty meeting because of conflicting schedules and priorities, are intimidated by the amount of work and organization involved in collaborative-learning experiences, and are often frustrated by students who do not carry their weight. Cen et al. (2014, 433) also found that “female groups exploit the added benefits of collaborative learning more than male groups”. However, according to them mixed gender groups excel the most, significantly improving their engagement, focus and quality of group work comparing to same gender groups.

Hybrid Collaborative Learning and Learner-centred Instruction in Geography Micro-teaching

Since this study attempted to determine whether this particular hybrid collaborative learning design supports the training of Geography student teachers and improves the implementation of learner-centred instruction in Geography micro-lessons, the teaching-learning activities implemented in the micro-lessons of the different groups as uploaded on VideoANT over a four-week period were compared. The results of this comparison are indicated in Table 1, where the occurrence of the different teaching-learning activities in the different lesson presentations from week 1 to week 4 are summarised.

From Table 1 it is evident that the participants focused mainly on teacher-centred instructional activities in the micro-lessons presented during the first week of micro-teaching. The student teachers mostly explained and dem-

onstrated content, read from text books, taught from PowerPoint presentations (43%) and used questioning as monitoring tool (35%) during their lesson presentations. The assessment of teaching-learning activities was mainly guided by the teacher student him/herself (100%). Although the focus in the Geography subject didactics was on the implementation of learner-centred instruction, in the first micro-lesson presentation the student teachers focused more on what the teachers were imparting than on what their learners were learning.

In the hybrid collaborative learning micro-teaching environment the type of engagement in lesson presentations from week 2 to 4 gradually became more learner-centred. Students tried to actively engage the learners in the learning process and expected of learners to discover information on their own and with the support of their peers. Although teacher-centred activities such as explanations and demonstrations of content and questioning by the teacher were still implemented, the learner-centred activities such as discussion of themes in cooperative learning environments and groups, class discussion, reports and feedback by learners also featured as lesson activities. Furthermore, the teacher students made use of different assessment agents to assess learners’ assignments and activities (Refer to Table 1). These results support the perceptions of participants that this hybrid collaborative learning design can assist and support students in planning and presenting more learner-centred and thereby, more effective micro-lessons in the Geography classroom. As is supported by the findings of this study, Jianhua and Akahori (2001) and Ravindra

Table 1: Teaching-learning activities in the Geography micro-lessons

<i>Types of teaching-learning activities</i>	<i>Week 1</i>		<i>Week 2</i>		<i>Week 3</i>		<i>Week 4</i>	
Explanation and demonstration of content by student teacher. Student teacher reads from textbooks and PowerPoint	10	(43%)	5	(18%)	6	(21%)	6	(18%)
Questioning by student teacher	8	(35%)	5	(18%)	5	(18%)	6	(18%)
Learners participate in class discussions	1	(4%)	4	(14%)	4	(15%)	8	(23%)
Discussion of themes in a cooperative learning environment and group discussions	1	(4%)	8	(28%)	6	(21%)	6	(18%)
Reports and feedback from learners during the lesson	3	(14%)	6	(22%)	7	(25%)	8	(23%)
Total	23	(100%)	28	(100%)	28	(100%)	34	(100%)
<i>The Assessment Agent of the Teaching-Learning Activities:</i>								
teacher (facilitator) assessment	9	(100%)	5	(63%)	4	(40%)	5	(41%)
self-assessment	-		3	(37%)	1	(10%)	3	(25%)
pair-assessment	-		-		1	(10%)	1	(8%)
peer assessment	-		-		4	(40%)	3	(38%)
Total	9	(100%)	8	(100%)	10	(100%)	12	(100%)

(2015) concur that optimal collaborative learning performance should integrate web-based and classroom-based collaborative learning. Britton and Anderson (2010) as well as Chang and Hong (2011) report that the student groups' feedback and ideas on students' lessons help to change students' instructional practices from teacher-centred to learner-centred.

CONCLUSION

The students involved in this case study were satisfied that the use of this particular hybrid collaborative learning design in micro-teaching is effective in providing an alternative way of helping pre-service Geography student teachers to develop learner-centred instructional approaches in classrooms. This hybrid collaborative learning environment enables students to view micro-lesson presentations in a more critical manner and to judge the learner-centeredness thereof, within group context. It provides students with a platform for meaningful collaboration and social interaction which include: formative assessment and feedback, monitoring, social discussions, arguing against differing points of view, adding to evolving ideas and offering alternative perspectives while planning and presenting micro-lessons, thereby contributing towards the improvement of their own and peers' teaching and learning skills. It is believed that the implementation of both web-based and classroom-based collaborative learning in Geography micro-teaching further contributes to the effective implementation of learner-centred instructional strategies. It offers a safe environment where students can reflect on their own and fellow students' micro-lessons.

RECOMMENDATIONS

Resulting from the difficulties and frustrations experienced by students in this hybrid collaborative learning environment, the following recommendations can be made to help improve this particular design.

- The Geography lecturer has to ensure that the student teachers are equipped with group and social skills for effective collaboration in hybrid learning environments. These student teachers should therefore have a solid theoretical foundation on collaborative learning environments as prepara-

tion for the training in and exposure to the hybrid collaborative learning environment during micro-teaching. Furthermore, as indicated by the students, it is recommended that the lecturer develop an assessment form or checklist on which each group member can indicate his/her contribution to and involvement in this hybrid collaborative learning method.

- All the participating groups should be gender-heterogeneous in composition, for more effective collaboration.
- The only real criticism from students was more of a technical nature and not aimed at this hybrid collaborative method per se: Some of them did not have Internet access at home, therefore it is necessary to allocate a specific venue on campus to enable these students to watch, assess and moderate micro-lessons on VideoANT.
- Other than the video-taping of micro-lessons used in this study it is recommended that in future digital video-cameras or e-tablets be provided to participants so that they can record their own group's micro-lessons. This will, amongst others, afford them the opportunity to re-record a flawed lesson.

LIMITATIONS OF THE STUDY

With the implementation of a hybrid collaborative learning environment in micro-teaching in this pilot study some limitations could be identified. The population was only a small number of student teachers, which limits the generalisation of the results. The study was implemented in a South African digital context where a number of candidates did not have Internet access at home. It can be argued that some of the student teachers were not well trained in collaborative learning skills which could have had an influence on their perceptions of this particular hybrid collaborative learning environment. Lastly, the main focus of the study was the implementation of learner-centred instruction during micro-teaching, and no reference was made to the use of specific Geography instructional tools such as maps, photographs, models and data analysis etc. in Geography education. Therefore the results and recommendations in this pilot study are general in nature and could possibly be applied to other subjects.

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