Supporting Learning Groups in Online Learning Environment

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Abstract: In this paper, we report on the initial findings on how to effectively support learning groups in online learning environments. Based on the idea that learning groups can enhance effective learning in online learning environments, we used qualitative research methods to study learning groups (interviews and observation of learning group interactions in online learning environments) and their facilitators. Preliminary results reveal that in order to have effective learning groups you need to take care of the following online design issues: develop comprehensive study guides, train online tutors, motivate learners through feedback, and foster high cognitive levels of interaction through questioning, rubrics, and peer assessment. We conclude that well thought through online learning group with appropriate questioning and feedback from facilitators and online tutors can enhance meaningful interaction and learning.

1 INTRODUCTION

The high rate of population growth in Uganda has increased demand for higher education. The demand is not commensurate with the number of higher education institutions and corresponding infrastructure in Uganda. Distance learning can cater for the increased demand for higher education. Distance learning is a mode of study where students have minimal face-to-face contact with their facilitators; the learners learn on their own, away from the institutions, most of the time. Distance learning in Uganda is dominated by the first generation model which is characterised by blending print study materials with occasional face-to-face sessions. Learners are given hard copy self-instructional study materials and regularly attend two-week face-to-face sessions at the university twice each semester. At most times, the students study independently from their workplaces or homes, using the print materials. Despite using this learning model, distance learning practitioners use learning group activities such as group assignments to enhance collaborative and cooperative learning. In distance learning, learning group activities can be achieved if learners are compelled to come together physically or some form of ICTs are used to virtually connect group members to learn collaboratively.

Collaborative learning hinges on the belief that knowledge is socially constructed although each learner has control over his/her own learning. Collaborative learning is underpinned by the social constructivist learning theory (Vygotsky, 1978). The proliferation of ICT in teaching and learning has created new possibilities for supporting collaborative and cooperative learning in distance learning (Muyinda et al., 2015). Learning groups have been preferred for propelling interaction and learning. Vygotsky argues that a person's learning may be enhanced through engagement with others. Use of computer supported collaborative learning can offer possibilities of students' interactions. Because many distance learners are working adults who are not co-located, computer supported collaborative learning can offer possibilities for effective online learning groups. However, motivating and sustaining effective student interactions is not easy to achieve. That requires planning, coordination and implementation of curriculum, pedagogy and technology (Stahl et al., 2006).

In cooperative online learning, learners share a common knowledge pool for accomplishing individual assignments (Muyinda et al., 2015).

Learning groups have been advocated for increasing interaction in the learning process (Curtis and Lawson, 2001). These have been widely used in distance learning to enhance learning. They do this

by giving group assignments to help in the initiation of learning groups. However, in first generation distance learning, the difficulty of co-locating students comes with the difficulty of determining participation of each group member in the group assignment. It is common to find group assignments contributed to by few group members and the remaining members attaching their names on the assignment. This hinders meaningful interaction which is a pre-cursor for meaningful learning. Lack of meaningful learning is the number one cause for high failure and dropout rates in first generation distance learning (Aguti et al., 2009). Fifth generation distance learning is praised for introducing virtual interaction and collaborative or cooperative learning amongst distance learners. It is our intention to find out how to make students more effective in online learning groups. We want to propose a model for effective online learning groups. Based on this model, a human-centred design process can be applied to develop an interactive system that supports effective online learning groups.

Section 2 of this paper reviews the literature defining and analysing collaborative learning, interaction processes in online learning groups, and interaction analysis in online learning environments. In section 3, we present the research directions and our research methods. Section 4 presents the preliminary results of our work. Finally, the paper is summarised in section 5.

2 LITERATURE REVIEW

2.1 Collaborative Learning

Collaborative learning refers to instructional methods that encourage students to work together to find a common solution for a given task (Ayala and Castillo, 2008). Collaborative learning involves joint intellectual effort by groups of students who are mutually searching for meanings, understanding or solutions through negotiation (Ashley, 2009; Stahl et al., 2006). This is what should happen in effective learning groups. This approach is learner-centred rather than teacher-centred; views knowledge as a social construct, facilitated by peer interaction, evaluation and cooperation; and learning as not only active but interactive (Hiltz and Benbunan-Fich, 1997; Vygotsky, 1978). Anderson in his online learning framework argues that learning can happen through student-teacher; student-student; student-content interactions (Anderson, 2003). Stahl et al.

(2006) also asserts that learning takes place through student-student interactions. Ludvigsen and Mørch (2009) found out that students effectively develop deep learning when supported by computer supported collaborative learning. Therefore, fourth and fifth generation distance learning can enable student-student interaction. Careful integration of computer supported interaction can play a big role in increasing interaction among distance learners using learning groups.

Collaborative learning is based on consensus building through interaction by group members, in contrast to competition. This can be very helpful for distance learners, who are typically adults. Educational Psychologists influenced by Vygotsky (1978) claim that students working in small groups can share and evaluate ideas, and develop their critical thinking (Norman, 1992; Sharan and Shaulov, 1990; Webb and Cullian, 1983; Wells et al., 1990). Collaborative activities are essential to encourage information sharing, knowledge acquisition, and skill development (Collison et al., 2000). Different technology tools have been adopted for collaboration in distance learning. This points to the need to systematically integrate technology into supporting learning groups for deep and meaningful learning.

2.2 Interaction Processes in Online Learning Groups

Dascalu, Bodea, Lytras, De Pablos, and Burlacu (2014) argue that to have effective discussion groups we need to have a friendly environment where students feel free and comfortable enough to express their ideas. The characteristics that bring success of groups is categorized into personal and organizational attributes (Hew and Cheung, 2012). Personal attributes comprise learner's trust, learner's self-awareness, learner's motivation, learner's commitment, and learner's willingness to share experiences. Organisational attributes comprise group size, similarity of learners' experience (age) or status, learners' geographical proximity, agreed clear aims and ground rules, flexibility to tailor a group to learners' needs, non-hierarchical structures, autonomy from external authorities, planning ahead, clarity of decision making and regular review and feedback (Hew and Cheung, 2012). Learner's motivation is a key attribute in encouraging interaction in learning groups.

Use of marks to motivate students has been widely used in online learning environments. Marks encourage students to contribute in online discussion

forums. However, Bullen (1998); Palmer, Holt, and Bray (2008) believe that marks do not help to develop higher order thinking skills in Bloom's Taxonomy. Once a student submits the mandatory posts or comments and is certain that s/he has scored the required marks, s/he is not obliged to contribute any further. Online facilitators have used guidelines of setting number of posts as a way of encouraging students to participate in online learning groups. However, Murphy and Coleman (2004) found that the quality of the discussion declined when students were forced by the course requirement to post messages in relation to a number of posting. The facilitator should supplement this with feedback that mediates learning. In learner-centred approaches the facilitators should minimally contribute in the online learning groups. The minimum contributions should be strategic in assisting learning. Unfortunately, learners would prefer the facilitator to give constant feedback. However, Arend (2009) found out that in forums that exhibited lower level of critical thinking, the instructors were very active in the online discussions, sometimes responding to nearly every student post. Jones (2007) found out that if students are introduced to topics that interest them, they are more likely to be motivated to contribute in the learning groups. Asking students to peer review one another's work can help increase deep interaction in online learning environments. Peer facilitation motivated learners to contribute in online discussions (Hew and Cheung, 2012). This is more common in the massive open online courses (MOOC) where class sizes are enormous and based on the community of practice theory as is espoused in Wenger (1998).

2.3 Interaction Analysis in Online Learning Environment

Quantitative methods cannot be solely depended on in analysing the quality of interactions in online learning groups. However, they may help in trying to create a ground for deeper content analysis by directing you to the specific group to look at in detail. Fugelli, Lahn, and Mørch (2013) used both social network analysis (SNA) and content analysis where SNA helped them to know the peripheral and nucleus participants in the community of practice. During the content analysis they picked peripheral groups and nucleus groups for further study. During an online class environment SNA can provide a quick understanding of the status of the learning groups. This can help give the facilitators prompt information on status so that the facilitator can

intervene appropriately. The facilitator's intervention can help to assist learning or motivate learners to interact through questioning and feedback. However, the introduction of interaction analysis in analysing the quality of interactions has seen deeper understanding of the learner's interactions (Jordan and Henderson, 1995). Gunawardena, Lowe, and Anderson (1997) developed an interaction analysis model used in collaborative learning. This model was developed to help in assessing the critical thinking, social and cognitive presence, problem solving, emotion expression and knowledge construction. Interaction analysis can help both the learners and facilitators to improve the quality of interactions and activities respectively. It was developed with different phases of knowledge construction and with more emphasis on a qualitative approach. This can easily be achieved through learning groups since learners can construct their own learning. Research into interaction analysis has revealed that teachers who do not provoke learners into the high cognitive levels will end at the lower levels of Bloom's taxonomy (Gunawardena et al., 1997).

3 RESEARCH DIRECTIONS AND METHODS

In order to answer the overall question on how to effectively support learning groups in online environments, we focus on three research areas: effectiveness of learning groups, processes of effective learning groups and tools for supporting effective learning groups. We want to answer the following research questions.

- What are the characteristics of an effective learning group?
- How to form effective learning groups?
- How can effective learning groups be sustained in online learning environment?
- What principles can guide the creation of a model of effective online learning groups?
- How can the learning group support model measure to the quality standards of an effective online learning group?
- What tools should be used for effective online learning groups.

These research questions will be answered through the following research directions.

3.1 Effectiveness of Learning Groups

This research direction seeks to understand the characteristics of an effective online learning group. This can be done keeping in mind the three sub directions: motivation, interaction sustainability, and interaction levels. To achieve these directions we shall seek to understand the teaching and learning methods that the facilitator should use to have an effective online learning group. We shall then be able to identify the interventions which the facilitators should do to: motivate learner's interactions, sustain learner's interactions and have high level cognitive learner's interactions as mentioned in Bloom's taxonomy (L. W. Anderson et al., 2001).

To achieve this, we shall do theoretical studies to get comprehensive understanding on how to measure effectiveness of learning groups. However, we shall further collect data from online facilitators from the University of Agder to learn the best practices in use for effective online learning groups. In the light of what precedes, we shall develop guidelines to inform the quality of learning groups. This research direction will be aimed at answering what is an effective learning group.

3.2 Processes of Effective Online Learning Groups

This research direction seeks to understand the formation and operation processes of an effective online learning group. Effective learning groups can be influenced at both the formational and operational level. Therefore, we shall seek to establish the processes that inform the formation and operation of effective online learning groups. This will guide us in establishing the actions taken by both the learners and facilitators to ensure an effective online learning group. These actions can be looked at with the following three dimensions in mind: motivation, sustainability and level of interaction.

To alleviate this problem, we propose to establish the actions by stakeholders that lead to formation and operation of effective online learning groups. We shall follow selected courses at both the University of Agder and Makerere University with the aim of establishing the formational and operational processes in effective online learning groups. We shall use the following methods of data collection: interview the facilitators of the selected courses, observe the learners in both face to face and online learning groups, collect data from learners through both interview and questionnaires, and use interaction analysis to establish the levels of interactions from the data interaction logs of the online learning groups. This will guide us to get the actions required for both facilitators and learners for effective online learning groups. With this information we shall then design scenarios for the processes for formation and operation of learning groups for both face-to-face and online. These scenarios will then be discussed with the learners in a focus group discussion in order to validate it and come up with the most comprehensive scenarios. However, we shall also engage with the facilitators through interviews to understand their roles in the formation and operation of learning groups. This will be centred on the activities the facilitator gives in a course. By comparing with existing frameworks, theories or models, we shall be able to suggest the most befitting characteristics for effective learning groups, differentiating clearly effective processes by the learners and facilitators. This research direction will be aimed at answering two questions: how to form effective online learning groups and how to keep the quality of the operation of effective online learning groups.

3.3 Tools for Supporting Effective Online Learning Groups in eLearning

This research direction will seek to design a model which will inform development of ICT based tools for supporting effective online learning groups. The scenarios developed in the direction above will critically be analysed to inform the development of a model for effective online learning groups. We shall then develop a proof of concept (POC) interactive system to be used in the evaluation of the model. The human-centred design process will be applied to design an appropriate system for effective online learning groups. This research direction will be aimed at answering three questions: what principles will guide the design of tools to support effective online learning groups, how the developed model measure to the quality standards of an effective online learning group and what tools should be used for effective online learning groups.

3.4 Methods

Qualitative methods were used in the data collection and analysis. Those consist of semi-structured interviews and tutors´ observations of students´ activities in the Learning Management System (LMS) for earlier courses. The respondents were

purposively selected from experienced online facilitators at the University of Agder who use learning groups in their courses. We conducted a one-hour interview with each of the facilitators to find out their experiences in effectively handling online learning groups. Each interview was transcribed immediately and informed the researcher in the next interview. The transcriptions were then analysed by categorising them into themes from which empirical meaning was derived. A similar research approach shall be adopted in the main study at Makerere University beginning August 2015. Preliminary results/themes from the University of Agder are described and discussed in the next section.

4 PRELIMINARY RESULTS AND DISCUSSION

These are results of a study on best practices for effective online learning groups at the University of Agder. These results will be used in formulating the hypothesis that guides subsequent parts of the research. The findings fall into five categories shown in Figure 1.
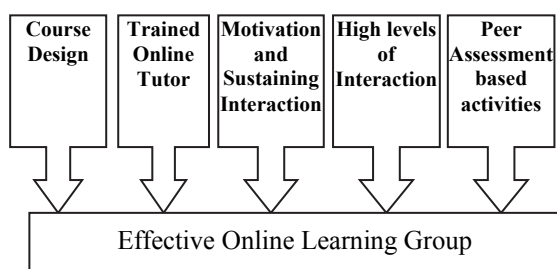

Figure 1: Salient elements in making effective learning groups.

4.1 Course Design

The online course facilitators stressed that there is need for comprehensive study guide and trained online tutors in order to have an effective online course. The necessity of trained online tutors indicates the need for mediation of learning in online courses. For mediation to occur there is a need to read and give appropriate feedback of questioning that assist learning. The study guide should include the detailed required activities with corresponding needed resources. These resources can range from ICT resources, library resources, etc. The LMS facilitators further suggested that for online tutors to be effective each tutor should be assigned not more

than 25 learners. However, this is in contrast with the MOOC phenomenon which emphasises that the more knowledgeable peers will scaffold the others in a community of practice environment (Wenger, 1998). This gives an indication about the need to mediate, guide, scaffold and assist learning for meaningful learning in groups. In one of our papers, where learners were using Facebook as means to mediate interaction and learning, learners felt that they needed the presence of facilitator (Mayende et al., 2014). If you chose to use tutors in a MOOC, the cost will not be manageable since MOOCs are free and yet online tutors have to be paid.

4.2 Trained Online Tutors

Online tutors are trained to give appropriate feedback and questioning that assist learning groups. Online tutor forms learning groups with five students per group. The emphasis is put on heterogeneous learning groups. The reason for heterogeneous learning groups was to get different experiential perspectives from different contexts. This was because learners were taking a course in global studies. However, there is need to understand how heterogeneity affects learning. In each group activity one student is selected by the tutor to become the weaver of the group. A weaver is a peer facilitator or group leader. His/her role is to direct the discussion and summarise at the end. This can help the group to have a sense of being together since the peer is the one directing the discussions and students will feel free to participate or interact. Nevertheless, online tutors and facilitators watch closely the interactions and can advise whenever needed.

4.3 Motivation and Sustaining Interactions

The online facilitators motivate learners through allocating marks on the participation in group activities. For LMS the number of students is relatively small compared to MOOCs. Facilitators give clear rubric on how marks will be assigned with emphasis on letting the learners know the type of interaction which will give them more marks. This is followed during the grading where the online tutor categorizes and reads all the contribution and awards marks on the quality of participation. In limited participation courses, each online tutor is allocated a maximum of 25 students. That gives possibility to read and grade all comments. The facilitators also said that they motivated learners by giving feedback

which encouraged additional participation within the groups. However, this contrasts the MOOC where marks do not make a lot of meaning to the learners. Motivating learners through giving feedback in MOOC can be very challenging since the class size is usually enormous. However, MOOCs have seen the use of badges to motivate the learners.

4.4 High Levels of Interaction

In order to develop high order cognitive skills through interaction, the online tutor and facilitator apply questioning as a method of assisting learning. Questioning is a method that assists cognitive levels of learning although facilitators may confuse assessment questions with assistive questions. Assessment questions are aimed at finding out the ability of the learner to perform without assistance, whereas assistive questions are used to provoke the thinking of the learner to the level s/he would not have attained by himself/herself (Gallimore and Tharp, 2002). The tutors are trained in how to handle this. That systematic questioning provokes the learner to read deep in the literature and start giving their own opinion based on literature. They also use feedback that is aimed at encouraging interaction among the students. Some examples of feedback given by the facilitator include; "that is a wonderful contribution", "that is a good approach", "fantastic knowledge", "reading Ethan's contribution can reinforce your good thought", etc. At some point when a particular student is not participating, the tutor will politely ask other students to find out if s/he has some problems. Sometimes, the tutor will follow up the missing student with a call and/or an email. This can be very complicated in a MOOC environment because there are very many learners.

4.5 Peer Assessment based Activities

The MOOC facilitator emphasised the use of peer assessment as a way of motivating learners to contribute in learning groups. The MOOC course unit was facilitated by five facilitators and observers. The course setting involves group work and each group is restricted to a maximum of 5 members. Unlike in the limited participation online courses, groups in MOOC are created by the learners themselves. In every module students do a group assignment and submit as a group submission. After that, each student is supposed to submit an individual assignment from his/her context. However, the students are encouraged to interact with one another during the making of the individual assignment. At the end of the module each student is required to peer assess five individual assignments. That means each student's work is peer assessed five times. Because of the large number of students the facilitator is not able to effectively apply questioning and feedback as a way of assisting learning. However, he is able to check on some groups.

5 SUMMARY

Online learning groups can help foster meaningful learning. This is supported by the literature on collaborative learning and we discussed how it can work effectively. We have presented preliminary findings on the best practices for effective online learning groups from the University of Agder. The main elements to be considered include course design, the availability of trained online tutors, learners' motivation and sustaining interaction, development of high levels of interaction, and peer assessment based activities. It was found that there is need to provide a comprehensive study guide and online tutors with a ratio of 25 learners per tutor. Effective learning groups can be achieved with appropriate intervention from the facilitators through questioning and feedback to assist learning in the online learning environment. This shows that scaffolding and guidance are propellers to meaningful learning within online learning groups. However, there should be a mechanism to automatically inform online facilitators whenever the learning groups are in critical states that need intervention.

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