

Flipped Classrooms using Social Networks: An investigation on learning styles

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Abstract—The Flipped Classroom concept has recently been trending as a novel approach to adding a refreshing touch to the traditional classroom lecture. Social Networks are increasingly becoming a ubiquitous characteristic of many learners and is often compared to a complementing platform to the more established learning management systems. In most conventional setups, learners have a diverse set of characteristics. One such - Learning styles, is often considered as necessary for ensuring productivity and learner satisfaction in a learning environment. This paper investigates learning styles used in a flipped classroom environment implemented with the aid of a popular social network. In the preliminary analysis, the learning styles of the learners are gathered through a computer-based test, and a simple feedback survey was carried out to evaluate whether the content presentation and flipped approach was satisfactory. The results in this case suggest that the satisfaction of students in a flipped classroom benefit from content prepared to match the selected learning styles of users (Visual).

Keywords- *Flipped Classrooms; Learning Styles; Blended Learning; ICT in Education.*

I. INTRODUCTION

The use of technology in the education landscape has been increasing and evolving throughout history. From Distance education efforts using radio and television to lessons recorded in storage media such as tapes and CD/DVDs, to the Internet and Learning Management Systems (LMS), today's teachers have multiple options in "blending" technology. The resultant blended learning environment is often welcomed by learners too. The dramatic reduction in total cost of ownership in computing devices has resulted in the widespread adoption of mobile computing devices. The fact that such devices pack many different functions is has resulted in a generation of students who are well adept at technology when compared to previous generations. To cater to the needs of such students, Educational "Apps" or Applications have an increasing presence in online software marketplaces.

Yet technology itself cannot ensure that the students achieve their intended learning outcomes. Learner Motivation has been identified as a key factor which affects their performance and satisfaction in educational environments[1]. To increase learner motivation and engagement in classrooms, activities which promote active learning are useful. This learning approach includes discussions, role-playing, case studies, group projects, debates and peer teaching.

The Flipped classroom concept is a recent addition to approaches to re-invent the classroom with active learning[2]. The "flip" in this context converts the classroom from a teacher-centric model to a learner-centric one in which educational technologies enable the content delivery to be shifted out of the classroom. The flipped content can be hosted on Video Sharing Sites, Social Media Sites, Learning Management Systems or even MOOCs (Massively Open Online Courses). The in-classroom time is often used for discussions.

Learning styles are defined as "a description of the attitudes and behaviors which determine an individual's preferred way of learning"[3]. Several authors have proposed models to classify learners, and many researchers have studied the impact of using these styles in different situations. However, none of them have considered the learning style when considering the flipping of the classroom. Certain research into flipped classrooms had explored the use of social media[4] as well as elaborated on the need for further research in the flipped classroom approach[1]. It is opportune to explore how this approach can be fine-tuned by considering diverse groups of students using their learning styles.

In this paper, we present our initial findings on a study carried out using a student group of 45 students following a study course in a Higher Education Establishment in Sri Lanka. The students were involved in a flipped classroom experiment which was facilitated using the Facebook Social Network and by using the regular LMS used.

II. LITERATURE SURVEY

Out of the learning style model documented in research, the Felder-Silvermann Learning Styles Model (FSLSM) is one of the popular models often used with Computer-based education. The model uses four dimensions, each of which is formed by a pair of distinct trends: active-reflective (ACT-REF), sensing-intuitive (SEN-INT), sequential-global (SEQ-GLO), and visual-verbal (VIS-VER)[5]. For classifying learners in this scheme, the Index of Learning Styles (ILS) is used as the instrument [6]. It contains 44 questions, with 11 questions for each dimension. Once a student answers the 44 questions, his/her learning preference in each dimension can be obtained, with scores ranging from +11 to -11. In each preference the level is ranked using the scores into Weak or Balanced (+3 to -3), Moderate (+5 to +7 or -5 to -7) and Strong (+9 to +11 or -9 to -11). The questionnaire can be administered to evaluate the learning preferences of participants, displayed using the four trends.

III. METHODOLOGY

The course used for the experiment was a second-year course, and a total of ten lecture sessions, with a productive time of 90 minutes each was available for the flipped environment. For the pilot run, two sessions were selected, interleaving with regular lecture sessions. Prior to the course, the learning outcomes for each lecture was identified, and the lecture was split into micro-lectures, each spanning a maximum of 10 minutes. The micro-lectures were a combination of PowerPoint slides and instructor interactions. Prior to their production, a script was utilized to prepare the lecture. For a given session, only six micro-lectures were utilized at maximum. At the end of each micro-lecture, questions were posted. The arrangement of micro-lectures was such that students could “jump” from any one to another within the day. (To accommodate global and sequential learners). The videos were hosted on a closed group on Facebook which was available to all registered students. Facebook was selected as it was the most popular social media platform among students (based on previous surveys among them). It was previously observed that students are more likely to comment or “like” videos or content on Facebook rather than use the LMS for similar expressions.

During the first week, students were requested to complete a web-based form which contained the ILS questionnaire [6]. They were provided access to the questionnaire and other data via an LMS platform (Moodle). A post-activity paper-based questionnaire was distributed at the end of the two flipped sessions to ascertain student satisfaction. It was captured using qualitative (open-ended question) and quantitative (5-point Likert) measurements.

IV. PRELIMINARY RESULTS AND DISCUSSION

Using the ILS, the scores obtained by students in each dimension was summarized into percentages. While most dimensions indicated a balanced preference for learning styles, in the VIS-VER dimension, it is noted that there is a slightly higher preference (22%) for visual learners. (Table1) While no co-relation between The flipped activity and learning styles is found, the purpose of evaluating the learning styles is to compare different flipped classroom approaches and characteristics of the students who participate in them. In the post activity feedback, a majority of the students had indicated that they considered the micro-lecture based Facebook platform to be more satisfactory than a regular Moodle LMS video (53%). In the qualitative feedback, some students complained about the need to prepare in advance for the lesson was a burden when considering time for other course commitments. Another issue was that some students were unable to follow the audio due to their inability to comprehend what was said by the instructor. This was later addressed by using a narration script which could be downloaded by the students. At this stage, the content for prepared lessons only addresses design considerations with VIS-VER and SEQ-GLO learning style dimensions.

TABLE 1 - SUMMARY OF LEARNING PREFERENCES (%)

Dimension	Strong (L)	Moderate (L)	Balanced	Moderate (R)	Strong (R)
ACT-REF	11.11	22.22	44.44	15.56	6.67
SEN-INT	8.89	13.33	51.11	15.56	11.11
SEQ-GLO	15.56	20.00	42.22	8.89	13.33
VIS-VER	22.22	26.67	33.33	11.11	6.67

Note: Strong(L) indicates a preference to the left of the dimension. Strong(R) indicates a preference to the right of the dimension.

V. CONCLUSION AND FUTURE WORK

The flipped classroom approach is a recent introduction which utilizes a blend of technology to encourage active learning in the classroom. In this paper, we describe an exploratory study applied in a classroom of 45 students to ascertain how student satisfaction in flipped classrooms behaves. While the students exhibit a moderate preference to Visual learning (compared with other dimensions) and are generally satisfied with the prepared content and approach, the content prepared thus far does not accommodate preferences of all dimensions equally. For example, video content would more appeal to visual learners. We hope to prepare a more varied content which is appealing to all learning styles. While the content in the flipped environment is not recommended (i.e., suggested) to learners during their engagement, this could be done with suitable enhancements. A significant challenge would be to capture the learning styles of students accurately. While technology can be scaled to larger groups, managing discussions among 45 students within the classroom in a two-hour session can be challenging if it requires a significant time commitment from an instructor. Peer teaching could be considered as an alternative to this. Another issue would be connectivity issues for streaming media and device limitations. The authors plan to extend this study to explore different forms of flipped classrooms and ascertain the satisfaction of students in them and report on the learning styles of students in such classes.

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