Impact of Effective use of E-resources in increasing Student Engagement

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ABSTRACT

Higher Education has reached its new height with the inclusion of digital technologies in it. Technology is drastically changing entire higher education sector of the world. Universities who aspire for world rankings have to use digital tools and services on campus. Many Universities are developing new strategies to implement these technologies to enhance student learning. There are expectations from our students of a blended education and expectations from Higher education governing bodies like UGC, NBA, NAAC etc. of increased integration of technology in our approach to higher education. Advances in technology and online repositories have made the concept of flipped learning a realistic option for the majority of educators. The goal of student-centric learning can be achieved with flipped learning. The objective of the current intervention is to set the pedagogical framework for appropriate use of online resources like eBooks and videos, technologies and tools to support interactivity which will enhance the teaching, learning and evaluation outcome. The experimental group students learnt one unit of the course with the flipped learning approach with the effective use of E-resources, while these students learnt another topic of the same course with the traditional classroom learning approach. The study results indicate that use of e-resources enhance student learning by improving student engagement in classroom which in turn improve will provide the learning record analysis.

Keywords

Higher Education, flipped Learning, blended education, pedagogical framework, Flipped Classroom Model

INTRODUCTION

"Flipped classroom" is normally characterized by the course structure and encompasses in-class and out-of-class activities. Flipped classroom mainly focuses on active engagement of students by utilizing the time allocated for classroom in interactive and collaborative learningactivities that includes personalized feedback and support from the teacher, whereas traditional lecture of teacher is a culmination from the regular and routine classroom time with asynchronous video lectures (Chen et al., 2014). Based on sound pedagogical and theoretical principles, the "flipped classroom" style aims at utilizing classroom time and space for appropriately designed interactive learning activities, which are very much student-centric. Such interactive activities nurture students'active learning by

engaging them in collaborative and problem-based learning activities and help to develop higher order thinking skills in them. (Prince, 2004).

In recent years, technology has become an integral part of modern education at secondary and post-secondary levels (Facer & Selwyn, 2013). Educator's role is therefore important as they have to select and use the technology effectively.

This learning style has been proved to be effective in improving the achievement of students'learning and increasing the interaction amongst all their stakeholders, i.e. peers as well as teacher based upon several studiesconducted (Schultz, Duffield, Rasmussen, &Wageman, 2014). Presently, "flipped classroom" learning is considered as a learning mode that accomplishes the aim of student- centric learning, and engages students in interaction of type - peer-to-peer as well asinteractions of type peer-to-teacher during the assigned activities (Gaughan, 2014; Pierce & Fox, 2012). In this learning mode, students need to watch and review the learning or study material before they attend the class. The learning material can be made available to the students via video lectures that involve teaching through direct instruction, or via any other convenient way; however students have to understand the contents and gain the knowledge themselves. Later,by implementing this particular technique, more time can be preserved for studentengagement in individual and small groups (i.e., problem-solving ,project-based learning, or in-depth discussions) and for student-teacher interaction (Gilboy, Heinerichs, &Pazzaglia, 2015).

RESEARCH QUESTIONS AND OBJECTIVES OF STUDY

The overallobjective of the action research was to inspect the degree of improvement in the learning outcomes of the students with the FC model implementation, leading to effective usage of classroom time. More precisely, scope of the research was to study the relation between the attributes i.e. a) useof classroom time (for student-centered learning activities) and b) their learning outcomes. This was in reference to the traditional learning goals of the course "Digital Electronics". One unit of the course was taughtby implementing the FC model and the other unit was taught by using thetraditional approach of – in-person lecture.

Following are the research questions, which wereconsidered for the study:

RQ1: Does the implementation of the "Flipped Classroom (FC) model" in a Digital Electronics course promote the effective use of classroom time for student-centered activities?

RQ2: Does this approach contribute to better students' learning outcomes in comparison with traditional teaching approach?

The first research question is about the utilization of classroom based teaching time. Authors argue that historically, in teaching,better use of classroom time is said to be achieved when itincludes student -centric activities that encourageand stimulate better cognitive goals of the higher levels of Bloom's revised taxonomy. These include the action verbs such as Analyze, Evaluate and Create (Krathwohl, 2002), as compared against the activities that promote cognitive goals of the lower levels of Bloom's taxonomy, such as Remembering. The FC model wasdesigned in order to allow the teachers to facilitate such learning activities as well as assessment activities by freeing the time that was earlier consumed by lecture-based content delivery and now has been moved out of the classroom time (Bergman &Sams, 2012).

For the second research question identified, the selection of learningobjectives is necessary.

1. To find impact of flipped classroom technique on student engagement and motivation
2. To identify whether flipped classroom improved course understanding and problem solving skills in students
3. To explore the impact of e-resources on student communication regarding the course

LITERATURE REVIEW

Stacey, E., &Gerbic, P. (2009) have presented and deliberated blended learning practices in the book.According to the authors, blended learning can be positioned, obviously between completely online learning and completely face-to-face learning. In thereport on blended learning in the USA, Allen, Seaman and Garrett (2007) define blended learning, also known as hybrid learning and suggest that there must be a drop in face-to-face classroom time. Littlejohn and Pegler (2007) discuss about 'strong" and 'weak" blends (p. 29) with respect to the courses, which are, almost entirely e-Learning based or contain very slight e-Learning. Garrison and Kanuka (2004) debate on the issue that amount of face-to-face time or online learning time is not the real indicator of blended learning, but effective integration of face-to-face or online learning within a course is important.Littlejohn and Pegler (2006) clearlyadmit the importance of the role ICT plays in the overallconcept of 'blended e-Learning'. They at the same time, present their theorydifferentiating the components, vis-a-vis: e-Learning and blending learning. In their approach they consider these concepts separately.By doing this they have achieved the approachesNot to be embedded. This is measured as a single phenomenon with less efforts made indifferentiatingthe concepts. Littlejohn and Pegler's (2006) documentation of these two featuresincreases the clarity to the debate about blended learning and allows better reflection of the technology complexities and learning.Welker, J. (2012) deliberates the methods practiced by librarian to use and manage electronic resources and has experienced the- task of collecting and analyzing usage statistics, which can be considered to be important for evaluating the effectiveness of resources and for making important budgeting decisions. Vaughan (2007) and others discuss that little support of online element to a face-to-face teaching cannot be termed as blended learning.Rogers et al. (2011) share some amazing results based upon their study which indicated that a majority (57.5%) of the respondents had some component online beyond the norm email communication with the faculty or instructor, while a quarter of the respondents (25.4%) with email only and about one in six (17.0%) were entirely in-person. As the level of e-resources increased, the proportion of students saying they "learned more" decreased considerably. In more than a 25% of courses delivered entirely in-person (almost 28.0%) students said they "learned more" than the other courses which they took in that academic term.Frehywot et al.(2013) did a systematic literature review and discoursed E-learning in medical education in resource constrained low-and middle-income countries. Beetham et al (2013) have redefined pedagogy in the digital age in their book.The authorscategorize formal and informal modes of education. The authors say that digital native student may be able to use technologies, but not necessarily they will learn from them. According to them, reading from book and writing based upon their reading would never meanthat they have learnt from books. Learners always need help of teachers. Learners may not know what it is possible to know, or how to make the journey successful towards the path they want to become, so guidance from teachers is desired.

O'Donnell et al.(2012) discussed the views of students' on E-learning.In their study they obtained the perspectives of the students as core stakeholders, on the practices of technologies in higher educationwith a vision that this couldhelp the educators and faculty in refining the pedagogical strategy of e-learning platforms, known as "learning management systems" i.e. LMS. The students are of the opinion that the implementation of technologies in higher education can beneficially transform learning; however, technologies will never replace lecturers.

Al-Zoube et al. (2010) discussed about Cloud computing based e-learning system. They worked on an environment which was used for both, teaching as well as learning and completely virtual.In addition to this there was also an interactive tool, which could be used for science education. The tool also exhibited properties of discovering and sharing new ideas of designing, modifying and monitoring educational or course contents over a period of time for a stipulated course; the same environment was also allowed to integrate different pedagogical approaches - i.e. both learning and teaching.

García-Peñalvo et al.(2017) have addressed two attributes as the advances in technology and current teaching methods or pedagogy. They also have considered the gap between these two attributes. They underlined that the gap is the reason of slowing up the amalgamation of new educational frameworks and technologies into the previouslyprevailingtechnical, operational frameworks. The authors proposed an ecosystem of current technologies and learning services.It is an architecture framework of interoperable components, whichsummaries the required elements, actions and methods for the ecosystem to become a reality.

Tabata et al. (2008) discussed the impact of faculty, teacher's attitudes toward current technological changes, processing of distance education, and technical as well as pedagogical innovations in education.

Cotton et al. (2006) evaluated e-learning and concluded that overcoming the constraints the approach of "thinking-aloud" has the potential to enhance research in this field.

Sasikala et al. (2011) did a study on Massive centralized cloud computing (MCCC) in higher education.

Sampath Kumar et al.(2010) Perceived the usage of e-resources and the internet by Indian academics. The Authors examined the perception and use of e-resources and the internet. Their prime objective was to find out how academics compare e-sources with print sources and how they perceive the advantages of e-sources and problems for accessing them. It also tried
to establish the extent of internet use, the purpose of such use and factors influencing it.

Tabataet. al. (2008) discusses the attitudes of educators and the facultytowards technology, distance education, and innovation. It also discussed their overall impact.The study examines faculty participation in relation to their technology use, their attitudes toward technology and distance education, and their adoption of innovations

Salmon, G. (2005) put forth a strategic framework for e-learning and pedagogical innovation in higher educational institutions.

White, S. (2007) reviews the progress of educational technology, then identifies critical success factors for e-learning through an organisational perspective derived from studies of six UK higher education institutions.

Hanson, J. (2009) through his case study research throws a light on the varying nature of academic identities into the implementation of e-learning at one UK University. He recommended that academics may experience a surprise to their trajectory of "self" or "person"when engaging with e-learning. The potential for e-learning to quick loss of presence of teacher and displacement as knowledge expert may seem to weaken their academic identity.

Rossiter, D. (2007) speculates beginnings of change and innovation in higher education. He projected a framework for embedding e-learning, derived from a longitudinal study of four Australian universities, each implementing a dissimilar approach for implementation of e-learning in their respective institutions.

Rossiter et al. (2006) emphasizes that e-learning, as an educational innovation, is obsolete. As an alternative, the authors argued that a more mature or sophisticated approach to organizational change is vital to enable higher education institutions to increase the benefits assured by the early e-learning enthusiasts. The article presents a concept of embedding innovation as a process which integrates four key dimensions namely widespread adoption, integration, legitimization and sustainability.

According to Chakravarty et al. (2005) the efforts of UGC-INFONET and INDEST-Consortium are noticeable and will positively support higher education system in India.

Lai, K. W. (2011)emphasizes on the effect of use of digital technologies as a support to shift cultural practices in teaching and learning and how it is meet better way the needs of 21st century higher education learners. He gave a brief discussion of the altering needs of the learners followed by a review of the complete impact of digital technologies on teaching and learning. The author also suggest how digital technologies may offer a more lively and flexible learning experience by implementing a participatory pedagogical approach and by blending formal learning with informal education.

Ananalysis of the literature works on the flipped classroom has emphasizednumerous issues, viz.

(1) There is a lot of variation in in- class activities which creates confusion about activities which can really help students in developing critical thinking skills. (O'Flaherty & Phillips, 2015)

(2) Flipped learning has the mixed impact on the learning outcomes of the students and their discernments of flipped learning. Hencemore experimentation isrequired into the teaching and learning designsusingdiverse research methods (e.g., Jungić et al., 2015).

In recent years, the positive impact of flipped learning has been discussed often. Few of the researches have evidenced the advantages of flipping the classroom, and its benefits for the students' learning performance (Hung, 2015; Wanner& Palmer, 2015).

Applying the ARCS Model of motivational design theories (keller)

According to John Keller's ARCS Model of Motivational Design Theories, there are four steps for promoting and sustaining motivation in the learning process: Attention, Relevance, Confidence, and Satisfaction (ARCS).

The ARCS model is engrained in a theoretical foundation. The foundation says about the "expectancy value theory"(Keller.1987 a). The model has evolved to the current state. The model states that in order to motivate students, the instructor or instruction materials need to (1) catch and sustain students attention (2) State why the students need to learn the content (3) make students believe that they are able to succeed if they exert effort and(4) help students feel a sense of reward and pride(keller,1987a)

Fig1:Kellers ARC Model

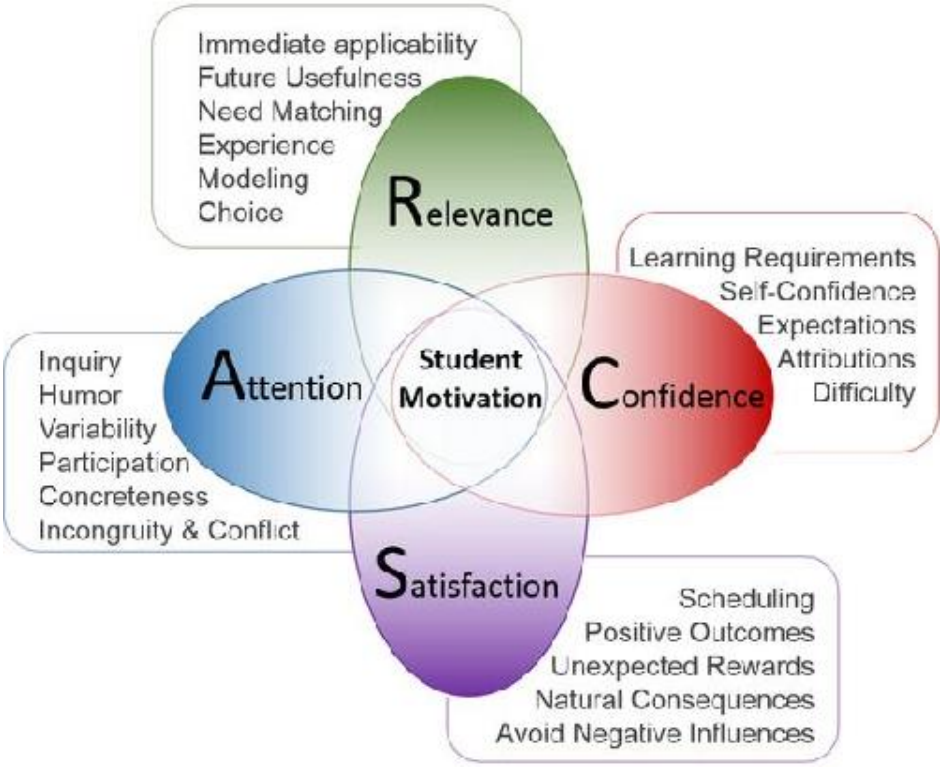


Fig 2: Kellers Arcs Model with detailed attributes

METHODOLOGY

The study was executed to find the impact of the use of e-resources on student learning, student engagement and learning outcome.

i. Data Collection

The study involved students from first year of undergraduate course 'Bachelor in Computer Applications(BCA). The course considered for the study was 'Digital Electronics'. To evaluate the effectiveness of the flipped learning approach, an investigation was performed to examine the impact of the method on the learning achievements of the students and personal-efficacy.

The strength of class was 60. The course was taught with both approaches - traditional approach as well as with the help of e-resources. One unit from the course was taught using E-resources like Flipped classroom technique, Discussion forum, video lectures etc. Google classroom platform was used to share the study material and video lectures with the students.

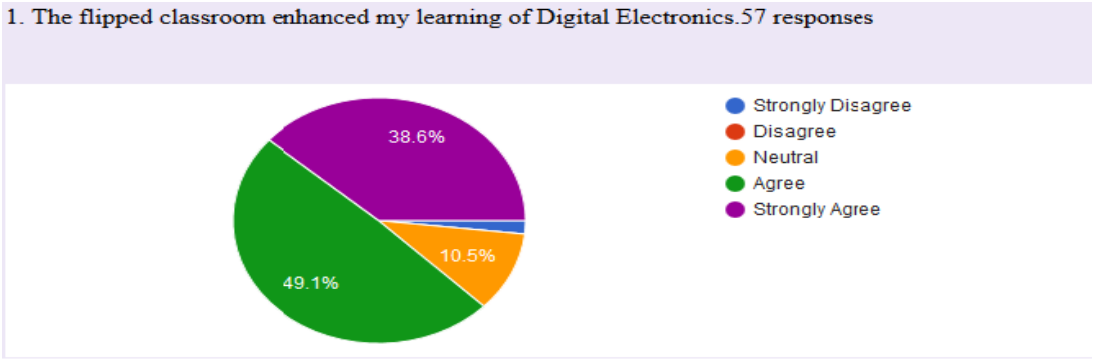
The classroom was converted to a blended one, where a mix of instruction in face-to-face and digital environments took place. Google Classroom was used as the primary means of assignment delivery and collection, as well as the hub for feedback and class discussion.The students used their laptops and encountered digital learning tools on a daily basis.

Applying the ARCS Model, for (1) Attention: mainly dealt with usage of online videos, short lectures, mini-discussion groups etc.(2) Relevance: Discussion with the students regarding comprehensively about the subject. Communicatedto the students about how the new learning will imbibe and apply their existing skills-What the subject matter and topic achieve for me today? -What will it achieve for me tomorrow?(3)Confidence: Ensured that the students were aware of performance requirements and evaluative criteria are allowed for small stages of evolution and progress during the teaching-learning-evaluation process

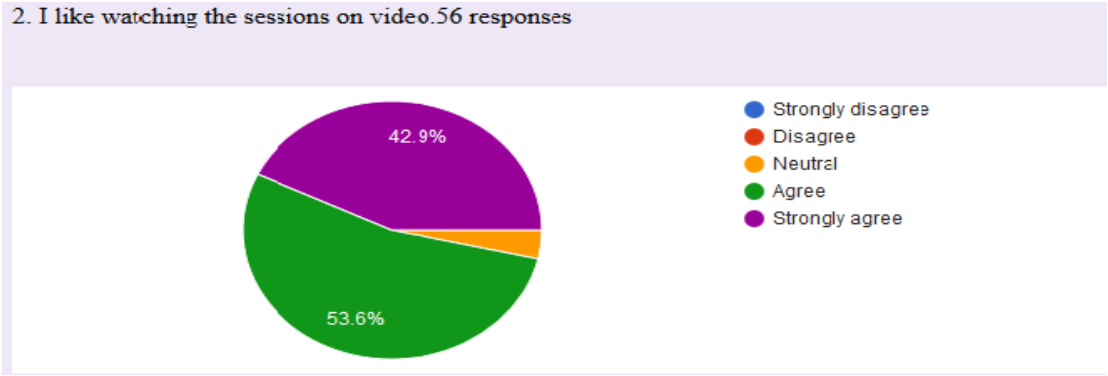
provided feedback and support internal credits for success.(4)Satisfaction:Provided feedback and reinforcement.

ii. Analysis

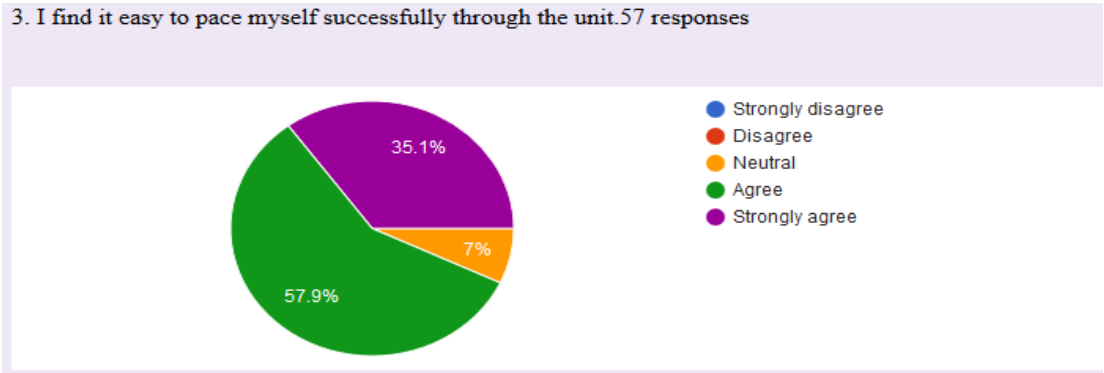
Responses were collected anonymously, using an online survey which consisted of a 5 point Likert-scale.



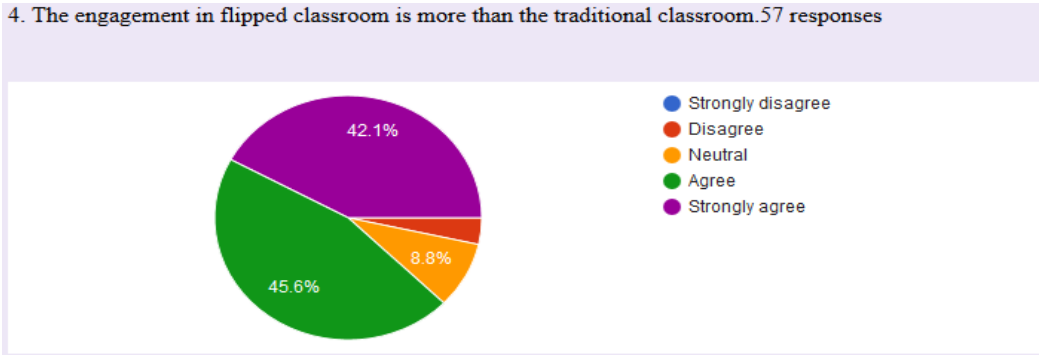
With regards of subject learning, 87.7% of the participants agreed that flipped classroom approach helped them in enhancing learning of the subject 'Digital Electronics'. (49.1% agreed and 38.6% strongly agreed)



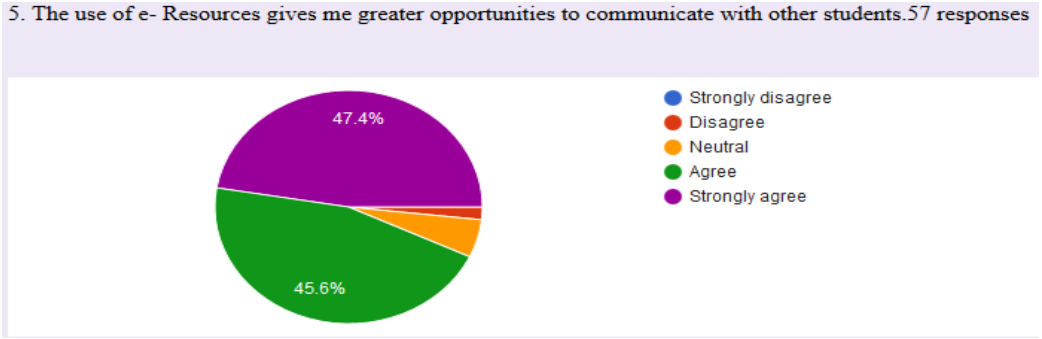
In context of watching videos, 96.5% of the participants found it interesting to watch video instead of listening to audio lectures. (53.6% agreed and 42.9% strongly agreed)



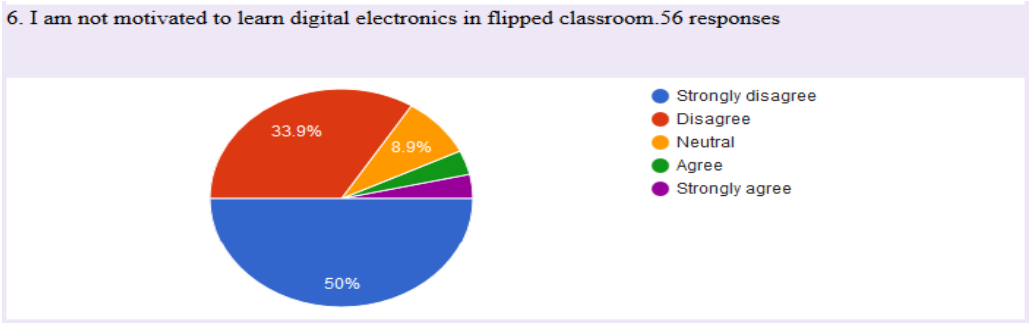
With reference to self-learning, 93.0% of the participants agreed that they can spend their own time to study and understand a specific topic according to their pace. (57.9% agreed and 35.1% strongly agreed)



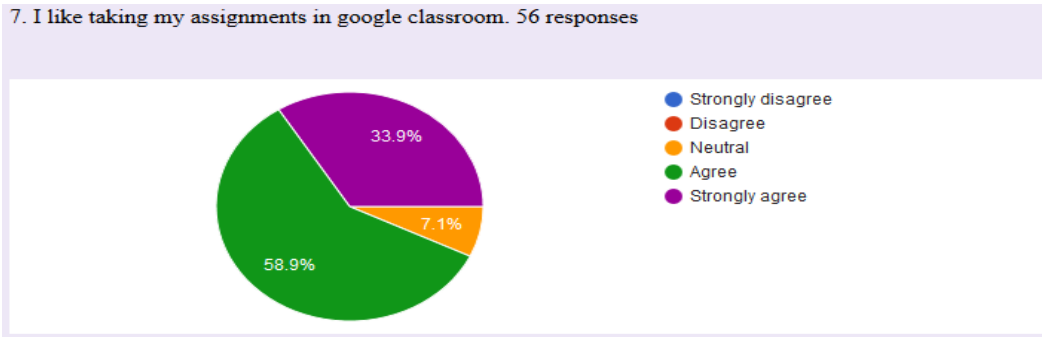
With regards to engagement, 87.7% of the participants agreed that they were more engaged in flipped classroom as compared with the traditional classroom. (45.6% agreed and 42.1% strongly agreed)



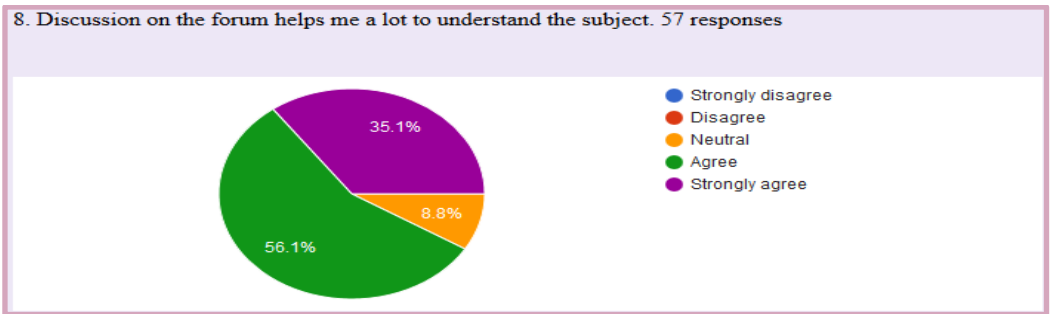
With reference to communication among the students, 92.0% of the participants agreed that e-resources gave them greater opportunity to communicate among themselves. (45.6% agreed and 47.4% strongly agreed)



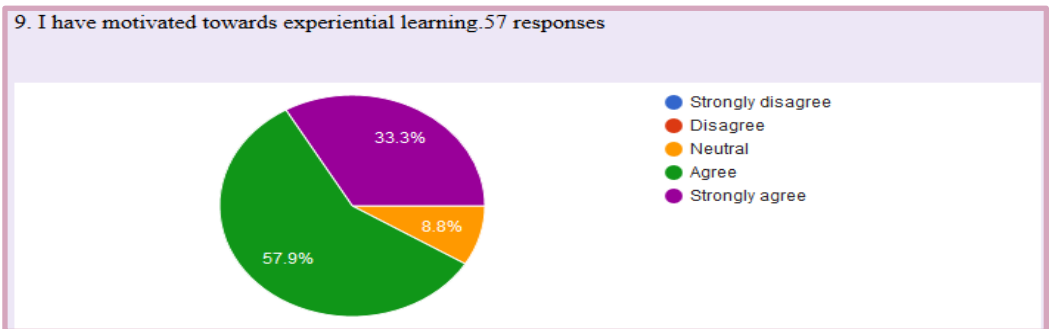
With reference to motivation, 83.9% of the participants disagreed on the fact that flipped classroom does not motivate students to learn, i.e., the participants agreed that they are motivated to learn the subject using flipped classroom approach. (33.9% disagreed and 50% strongly disagreed)



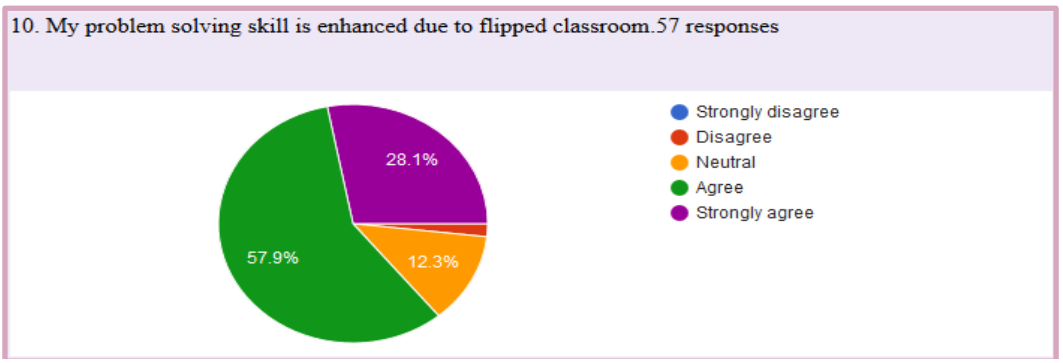
In regards to ease of use, 92.8% of the participants agreed that Google Classroom was easy to use right away,(58.9% agreed and 33.9% strongly agreed).



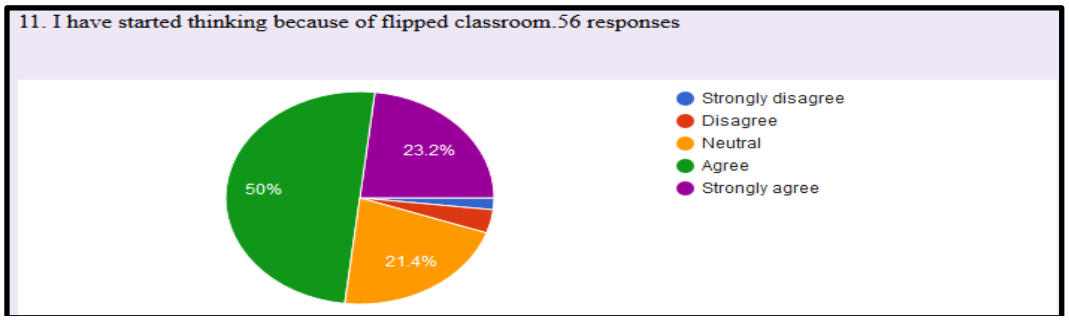
With reference to the understanding of the subject, 91.2% of the participants agreed that discussion with their peers on the discussion forum helped them. (56.1% agreed and 35.1% strongly agreed)



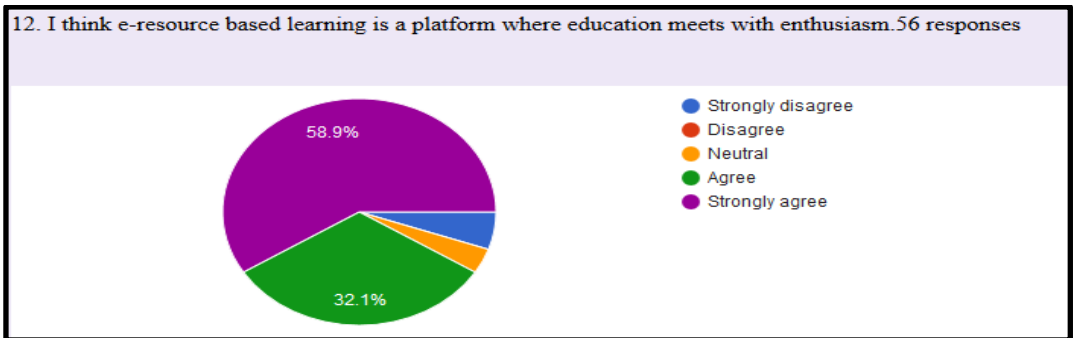
With respect of approach towards experiential learning, 91.2% of the participants agreed that they are motivated towards experiential learning. (57.9% agreed and 33.3% strongly agreed)



With reference to problem solving skills, 86.0% of the participants agreed that flipped classroom enhanced their problem solving skills. (57.9% agreed and 28.1% strongly agreed)



With regards to thinking ability, 73.2% of the participants agreed that flipped classroom made them think and improved their thinking ability. (50% agreed and 23.2% strongly agreed)



In context of providing feedback about e-resource based learning, 91.0% of the participants thought that e-resource based learning is a platform where education meets with enthusiasm. (32.1% agreed and 58.9% strongly agreed)

CONCLUSION

The Analysis of the student responses shows that impact of flipped classrooms was positive. It also reflects that the method significantly helped the students' achievement in learning and personal efficacy. The results of the survey have not only provided numeric information around student perception of engagement, self-efficacy and ownership of learning, but they have revealed possible connections between these feelings and the use of digital learning tools in the classroom.

FUTURE SCOPE:

The FlippedClass model needs to be considered as an effective tool to be used in the classroom since it also converts mere lecturing sessions to more student-engaging, student-centric-learning activities. Subsequently, in an experimental group, more classroom time was seen to be existing for-applying learning undertakings that encouragedknowledge goals. Future work could have action research to offeraddedconfirmation of the impact of FC model on students' educational experiences and their performances. Last but not the least, these works could also adopt a more refined level of investigation for studying and revealing how the FC influencesan individual student, and his or her learning patterns.

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