

Blended Learning Framework – Instructor's perspective and Student's perspective in Higher Education Institutes

Dr.Satvinder Kaur¹, Ms.Ushveen Kaur²

¹ Associate Professor, Dept. of Commerce, Sri Guru Gobind Singh College of Commerce, University of Delhi

² Assistant Professor, Dept. of Computer Sc., Sri Guru Gobind Singh College of Commerce, University of Delhi

ABSTRACT

In today's learning scenario technology plays a very important role. We have to understand how this technology can be used for the online teaching along with understanding its challenges. Students studying in higher education institutions these days want flexible learning environment to achieve their learning objectives. Online learning environment allows students to have more time and opportunities to learn and practice their knowledge for achieving success. Higher education institutions considering online mode of teaching face the challenge of creating a framework that when used strategically adopted would improve the quality of education in their institute. And in this fast changing times, institutions cannot just continue teaching with only offline teaching pedagogy or only online teaching. And thus the need for blended model of learning. Blended learning is going to inculcate thinking ability in the students it is going to improve the capability of the students to solve the problems we have to adjust in the new environment and the all the mental barriers needs to be removed. We must understand that the key role players in an education system are - teachers, students and the institution that facilitates the teaching process. The purpose of this study is to provide a state of the art blended learning framework for higher education institutes that looks at blended form of learning with respect from these three key players. This study will define the preparation required before implementing the blended learning framework. And the things to be followed while conducting online and offline classes.

Keywords

e-learning, blended learning, higher education, teacher perspective, student perspective, technology, education, blended learning framework

Article Received: 10 August 2020, Revised: 25 October 2020, Accepted: 18 November 2020

Introduction

1.1 What is Blended Learning? How is it different from e-learning?

E-learning

E-learning is a learning model that uses only online mode of teaching. All the sessions will be conducted online. Students do not need to physically visit the institute at all.

E-learning can be categorized into-

- (i) **Static e-learning** - In static e-learning, learning takes place through videos and online learning material. There is no live online one-on-one session with the instructor. The online resources are same for all students.
- (ii) **Dynamic e-learning** -In dynamic e-learning, live online sessions are conducted by the instructor. Interaction takes place between the student and the instructor and hence the name dynamic. The online resources may or may not be same for all students.

Blended Learning

Blended learning is a learning model that combines online and offline methodologies of teaching. Blended learning combines the e-learning with traditional model of classroom teaching.

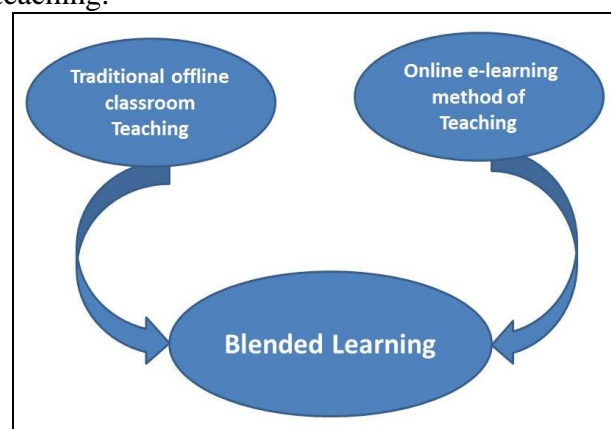


Fig. 1. Blended Learning

Difference between e-learning and blended learning

In e-learning, learning is only and only online. The benefit of which is that the student gets the flexibility of time and location to learn. The

student can learn at his own pace. Whereas in blended learning, student gets to option of all learning methodologies and he can then choose the one that suits him.

In blended learning model, the key of an effective learning model is defining the balance of various methodologies that are combined. So the institute that plans to implement blended learning model in their organization must analyze their own system, their students, courses to be studied, their teachers, technology they have to create a blended learning model that suits their institute.

1.2 Why Blended Learning?

Blended learning is going to inculcate thinking ability in the students. It is going to improve the capability of the students to solve the problems. We have to adjust in the new environment and the all the mental barriers need to be removed so the new learning environment has given a challenge to the teachers where we consider them learners throughout their life. So, in blended learning mode we have to adopt effective pedagogy which will be used for offline and online teaching.

Online education has put teachers in the teaching training mode again to learn the online education features. Teachers cannot be replaced by technology so we need to device new methods to increase student-teacher connection.

When we talk about the need of the mentors we have to understand that we have to value knowledge. Knowledge is expandable, which exists, which remains and which expands so we cannot consider any study or any area to develop without having the knowledge and the theoretical concepts which give the foundation to all the studies. When we incorporate the theory and use it in the practical life, it gives beautiful results. Knowledge is to be backed by theory for having constructive outcomes.

1.3 Types of Blended Learning

There are four blended learning models [1] [25]. The concept of blended learning higher education is still evolving and a lot of research is going on. So there is no standard on the types of models of blended learning pedagogy.

Rotation Model – In this type of model, student chooses amongst different type of learning methodologies in which at least one should be online. Student can rotate from one learning method to another and achieve personalisation. This model can be further divided as

- a) **Station Rotation Model** – In this model, the student uses different pedagogy of learning in each class for the same subject at the same scheduled time. This change in methodology is suggested by the faculty or the student.
- b) **Lab Rotation Model** – This model is same as station rotation model, with the only difference that in station rotation model, student stays in the classroom only. Whereas in lab rotation, the student goes to the lab for online learning methods and will stay in classroom for other methods (peer-to-peer, group discussion, one-on-one with faculty, etc)
- c) **Flipped Classroom Model** – In this model, students learn independently online through online video classes and the offline classroom time is used for supervised work with the teacher. There is no one-on-one physical teaching.
- d) **Individual Rotation Model** – In this model, the learning model is different for each student and it changes in every class. A teacher or a random function decides the learning methodology by rotation. Rotation takes place amongst a fixed set of methodologies only, not necessarily all.

Flex Model – In this type of model, students can learn at their flexibility. In this model, the basic subject concept is learnt online from online resources and during the offline physical class teacher concentrates on practical examples and numerical solving.

Self-blend Model – In this type of model, a student chooses additional courses apart from the curriculum. These courses are completely online and thus the student can complete the course online.

Enriched Virtual Model – In this type of model, the concept is totally online learning. All classes are conducted online. A student needs to visit the institute only when the student needs physical classroom session.

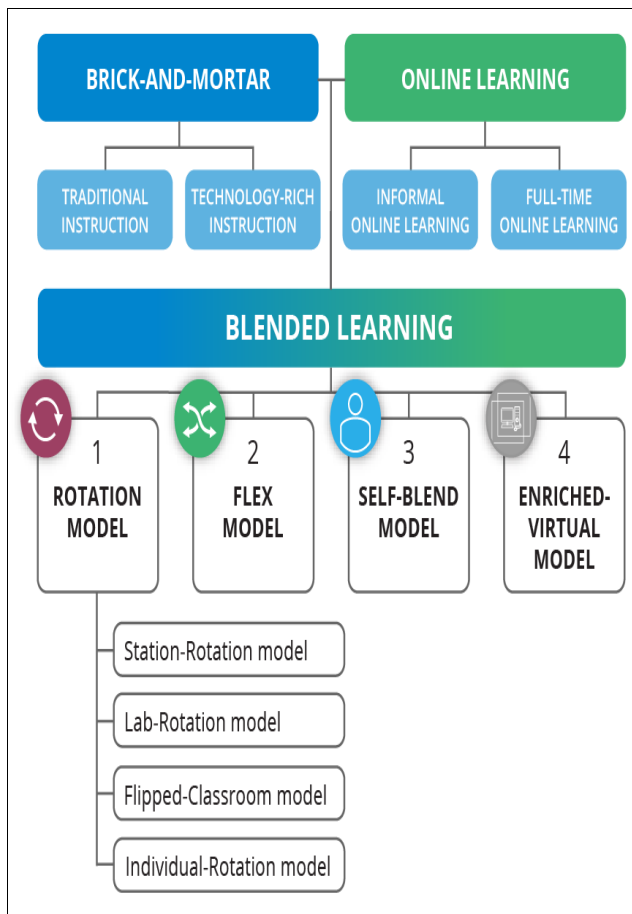


Fig. 2. Types of blended Learning models [25]

1.4 Literature Review

A lot of research has been done on blended learning in last decade because blended learning is the need of the hour teaching methodology [20][24][23][14]. Some studies talk about effectiveness and social opportunities of offline teaching methodology with increased learning opportunity in online teaching [12]. Studies have given definition of blended learning as combination of best features of any two types of methods of teaching [15]. Studies are conducted to analyze the effectiveness of blended model with mobile technology [16]. A study discussed the use of the platform called Edmodo, a social network that can be used for blended learning [26]. A lot of research studies have tried to evaluate various factors of blended learning and its effect on students' knowledge in higher education [24][8][6]. Some studies look at the various features from student point of view, whereas some other studies discuss teacher view. A study points out that though learning and education are continuous processes, online access allows the students to continuously learn and be engaged [7]. Some studies talk about flexibility that the

students get in blended learning. Student gets the flexibility to watch the class video any time during the day. A literature suggest that student's attitude, technical skill, self-discipline are very important for the success of blending learning pedagogy [3][21]. Student engagement at behavioural, emotional and cognitive level is also discussed [4].

1.5 Structure of the paper

This research study, first performs analysis of e-learning environment in higher education institutes from both teachers and students perspective. The statistical evidences are then used to draw inferences about the required features and problems of e-learning. Then taking insights from above analysis, the study will suggest and discuss a successful blended learning environment for higher education institutes taking into consideration students, teachers and institutional features.

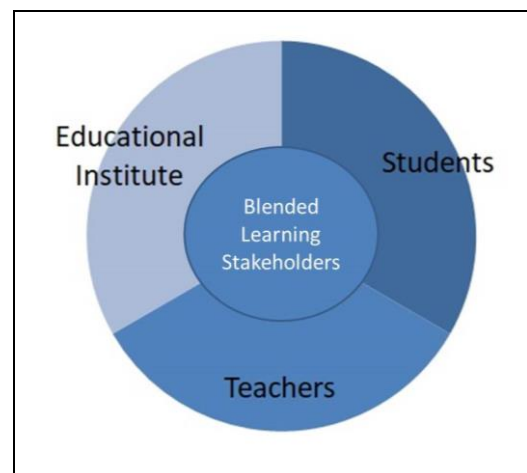


Fig. 3. Blended learning stakeholders

Before starting to implement Blended Learning (BL) environment in an institute, the following questions should be the asked:

- What are the features of BL that an institute must have from teachers' perspective?
- What features BL pedagogy of education must have from students' perspective?
- What are the challenges and difficulties that can be faced by the teacher or the student during BL?

Following the basic reference from these questions, this study will attempt to quantitatively analyze and present a suggestive BL framework.

1.6 Methodology

Understanding all the three key elements of learning is extremely important for creation of a blended learning model for a specific institute. In this study we have taken responses from 110 students using questionnaire on google form to understand the student perspective. Data was collected from them online. To understand the teacher perspective, responses from 110 teachers was collected and analyzed. The data was collected from an institute that is using google suite tools for teaching. Basic excel and SPSS is used for the analysis. Pie chart, bar charts, tables and diagrams have been used for illustrations.

2. Result Analysis and Discussion

2.1 Analysis of features of e-learning pedagogy from student's Perspective

Various aspects of e-learning pedagogy were qualitatively analyzed. Data was collected using google form from 110 students studying in various higher education institutes. This study took input from students studying different courses in different colleges/universities to get a broader students perspective.

Student Perspective – student satisfaction with respect to features of live online teaching

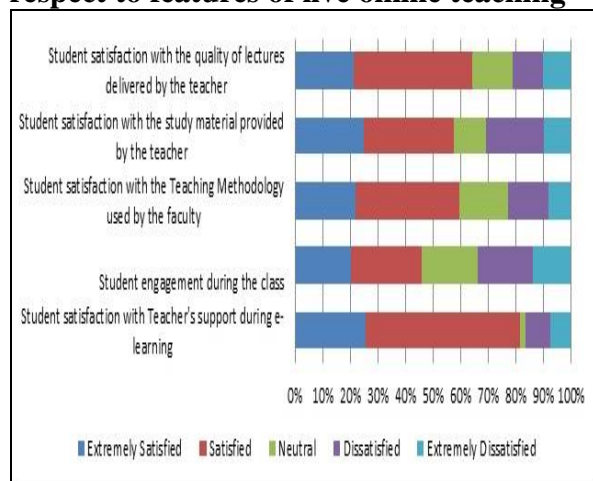


Fig 4. Student Perspective – student satisfaction with respect to features of live online teaching

Fig 4 shows that student satisfaction with respect to the quality of lectures delivered, study material provided by the teacher, e-learning tools used by the teacher for teaching in online mode, teacher's support during e-learning, is almost above 60%. Whereas only 45% students felt that they were well engaged during the online classes.

Student Perspective – Availability/ need for technology - hardware and software

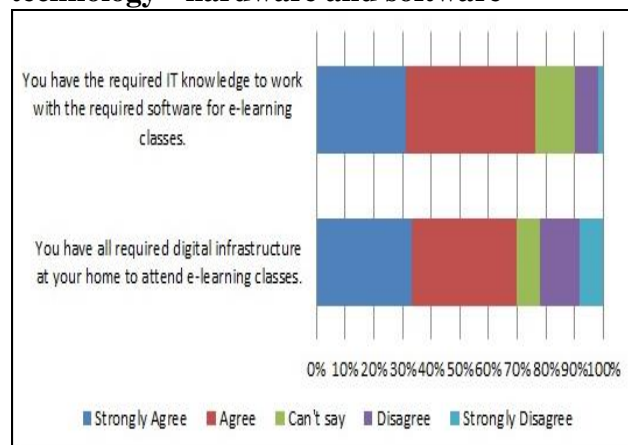


Fig.5. Student Perspective – Availability/ need for technology

Fig 5 points out that more than 75% of the students feel that they have the required technical knowledge and the required hardware technical resources at home to attend online classes.

This diagram also depicts that only 10% of the students feel that they need help with technical knowledge to use the online teaching tools. Whereas only 20% need hardware digital infrastructure support from their Institutes.

These two research questions here point out a very important thing about the youth of today, that they already have the basic required knowledge of the software tools used during online classes. Also the students these days have the required digital hardware infrastructure like Desktop/laptop/iPad for attending online classes.

Student Perspective – Evaluation

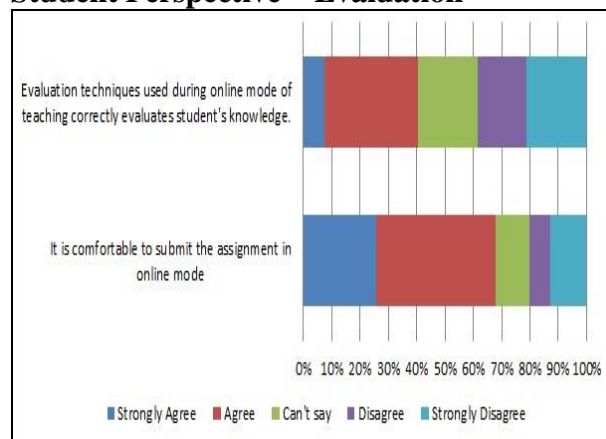


Fig.6. Student Perspective – Evaluation

Figure 6 here points out that only 20% students feel online assignment submission is difficult, whereas only 40% feel that evaluation method used by the instructor correctly evaluates student's knowledge about the subject.

So students find it easy to write/ type an assignment and upload it rather than to physically submit the assignment. This is because for physical submission, the student must go to college on the submission date, must find the teacher and then submit the assignment. Whereas in online submission, even if the student is busy in some professional/personal work he/she can submit the assignment on the designated date and time easily.

Student Perspective – Practical Subjects

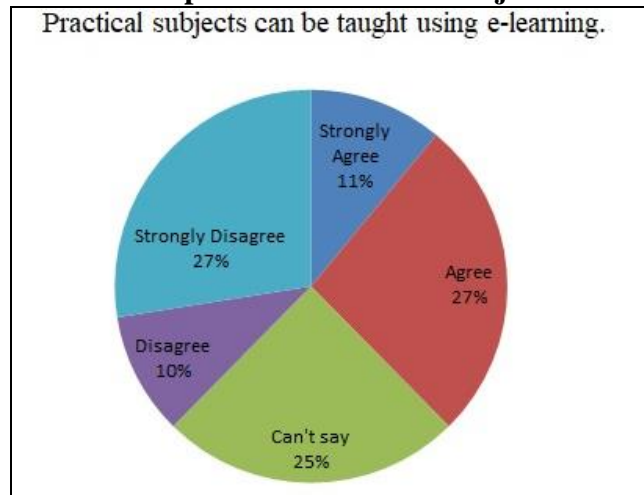


Fig.7. Student Perspective – Practical Subjects

Fig 7 here points out a very interesting thing that 25% of the students are not sure if practical subjects can be taught using online mode of teaching. And this is because online classes are not conducted full-fledge for all subjects in higher education institutes. Whereas these rest of the students are equally inclined towards success as well as dissatisfaction about online classes for practical based subjects.

Student perspective – Problems faced during online classes as compared to offline mode.

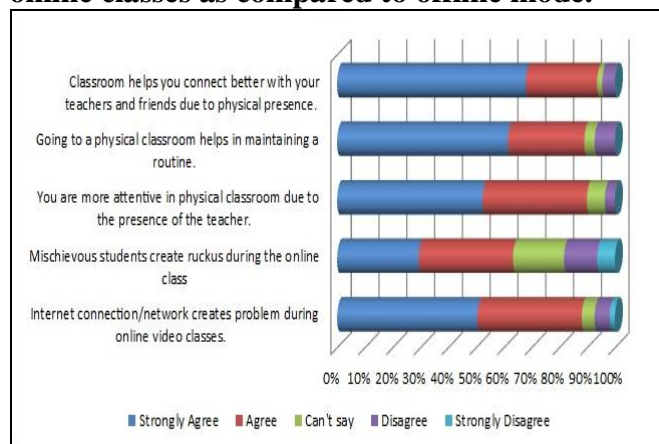


Fig. 8. Student perspective – Problems faced during online classes as compared to offline mode.

In Fig 8, the research study depicts the problems faced by the students during online classes. A good 90% students agree that they connect better with teachers and their classmates during physical classes. This study suggests that to improve on this feature, online classes should not be conducted exclusively, rather classes should be conducted in blended mode i.e. online and offline both. Even a few offline classes will help in student-teacher and student-student bonding.

85% of the students felt that they had a better routine/schedule during physical classes. This study suggests that classes whether conducted offline or online must follow a given timetable. Following a given schedule helps to maintain routine in the life of students and teachers. Also the administrative authorities of the institute will be able to oversee the management of the classes well only if the timetable is followed for the conduct of classes.

85% of the students agreed that they are more attentive in the physical classes rather than online classes due to the physical presence of the teacher in physical classroom. The study here gives 2 suggestions–

- (i) Classes should be conducted in blended mode. This will help improve the students' attention span. Conducting classes in physical mode creates a connection between the teacher and the student. This connection helps to maintain the student's attention span even during the online classes. Exclusive online classes lead to a disconnection and thus lower attention span.
- (ii) Teacher should keep their video switched-on during online classes. Sometimes due to connectivity/network issue teachers tend to switch off their camera while conducting the online class. This study suggests that when the students see the teacher, the connection created during blended mode offline class, is re-created in online mode class too. And creation of this connection leads to better attention during the class.

Almost 60% of the students agreed that mischievous students create ruckus during the class. Notorious students sometimes create mischief during the online class by unmuting them-self, by start/stop the recording, by leaving the online class and joining again. This study suggest the following two solutions for this –

- (i) There are a lot of settings allowed by the online class conducting tools like Google meet, Microsoft Teams, Zoom. Setting like keeping all participants on mute, being able to remove a student from the class, etc. These control setting should be given to the teacher by the institute technical head so that the teacher gets complete control over the online platform and thus able to conduct his/her online class well.
- (ii) This study suggests that if the students attention is improved by following the above two steps then the student will be alert in the class and thus not create mischievous troubles during the online class.

Apart from a meagre 10-12% of the students, all agreed that internet connectivity is a major problem while attending online classes. This study suggest that to deal with this problem-

- (i) Students must ensure that they have a high-bandwidth internet connection at home. Mobile phone hotspot does not provide enough bandwidth and speed.
- (ii) Government should provide internet plans for students at subsidized rates.

2.2 Analysis of features of e-learning pedagogy from Instructor's Perspective

A survey form was shared with teachers of various higher education institutes in India and data was received. 114 teachers responded to the survey teaching different subjects like computer sc, economics, commerce, English, linguistics and mathematics. We got responses from all age group of teachers too varying from 25-30years, 30-35years, 35-45years, 45-50years and 50-60years.

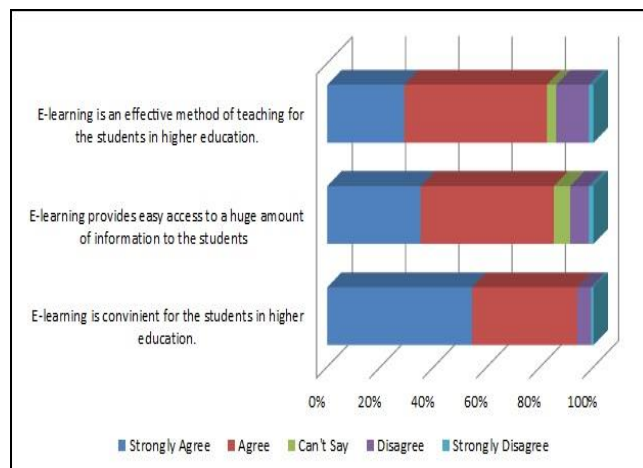


Fig. 9. Teachers perspective - advantages

Fig 9 above points out that 82% teachers agreed that e-learning is an effective method for teaching. Teachers estimated the effectiveness of the class on the basis on improved score in the exam. Teachers agreed that blended mode of teaching is a better mode for teaching a subjective paper for better subject knowledge and effective assessment.

Fig 9 also points out that 85% teachers agreed that e-learning platform gives easy access to huge amount of information to students on the internet. Too much data or information can be good for clarity of concept but at the same time, sometimes too much data becomes overwhelming for the students. This study suggests specified offline and online study material should be provided to the students. Also additional online and offline reference links should be provided for each subject by the curriculum design committee or by the teacher.

Fig 9 depicts that 94% of the teachers agreed that online classes are convenient for the students to attend. This is because online classes save travel time, travel cost and can be attended at the convenience of their home.

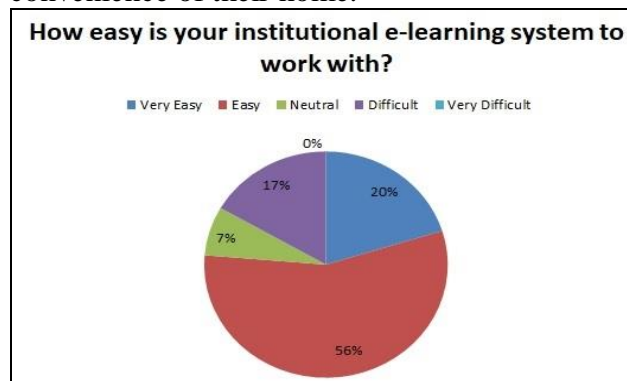


Fig. 10. Institutional e-learning system

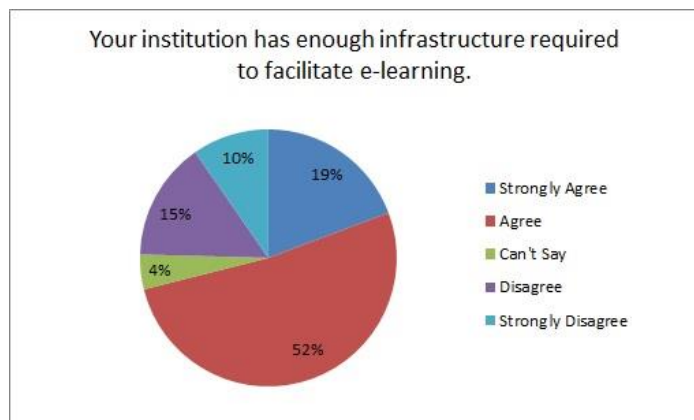


Fig. 11. E-learning Infrastructure

Fig 10 and fig 11 show that 71% teachers were satisfied with the availability of e-learning infrastructure of their institute, and only 17% found it difficult to use. So this depicts that higher education institutes are providing access to e-learning tools to their faculty and students. Also this study shows that teachers these days are well aware of the basic e-learning tools required for smooth conduct of online classes.

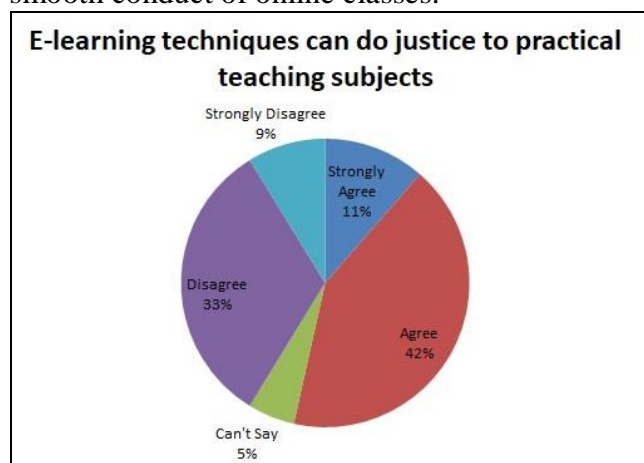


Fig. 12. E-learning – Practical Subjects

Fig 12 here shows a very interesting thing that in the student survey too we saw that the students were not sure if e-learning online classes do justice to practical subject, and in the teacher survey too, we can see that the almost same number of teachers are agreeing with the research question and almost equal number disagree. So we can't reach a conclusion for this research question. Further research is required for this.

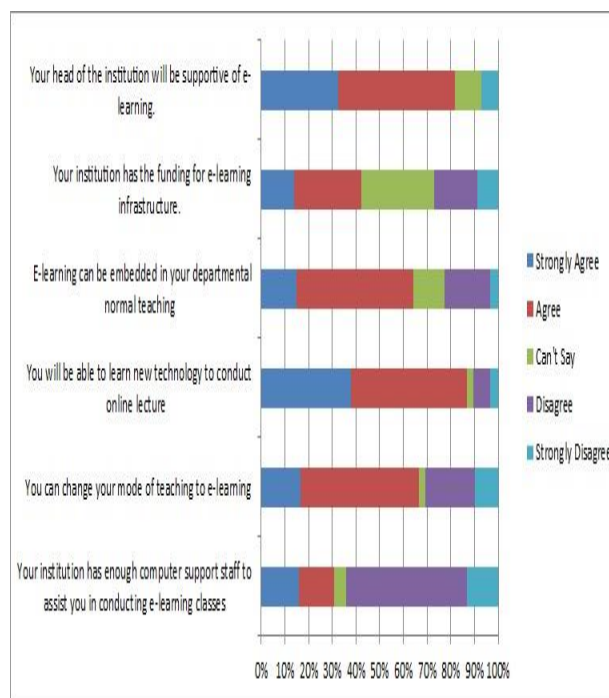


Fig. 13. Teacher's perspective

Fig 13 shows very positive attitude of teachers towards e-learning. Fig 13 depicts that teachers feel that their head of the institution will be supportive of e-learning. Teachers agreed that e-learning can be used as mode of teaching for their subject and that the teachers are ready to learn new tools for that.

Another thing to see in this bar-graph is that it shows that more than 65% teachers reported that their institute does not have enough technical support staff. So the higher education institutes must take steps to employ more technical support staff.

Almost one-third of the teachers are not sure if their institute has enough financial support to support e-learning infrastructure. Higher education institutes must find ways to raise funds for technical software and hardware infrastructure to support their teachers and students in e-learning.

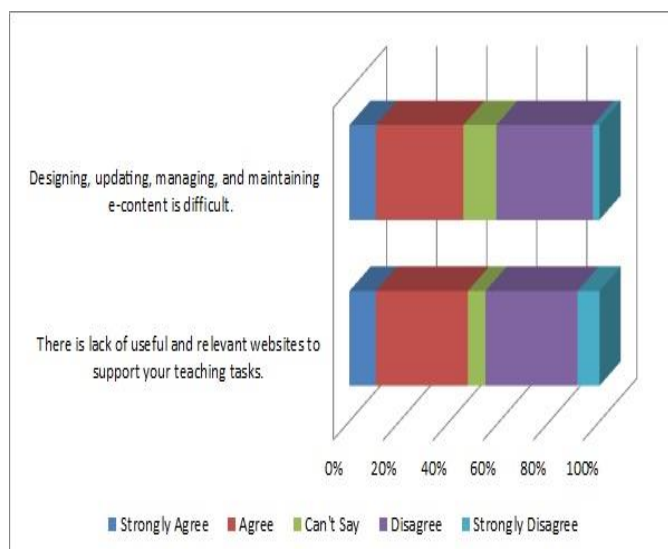


Fig. 14. Teacher's perspective – e-resources

Fig 14 points out that there is a lack of useful and relevant websites to support teaching task in terms of providing chapter powerpoint slides, study notes, sample quizzes, etc. this study suggests that publishing houses must try and provide all type of e-resources for the teachers to facilitate them in the teaching process. And due to non-availability of resources, designing, updating, managing e-content is difficult and time consuming for the teachers. This study suggest that for managing the e-resources well, teachers should be given hands on training in told like- Google Gsuite, Moodle, Gnomio, etc

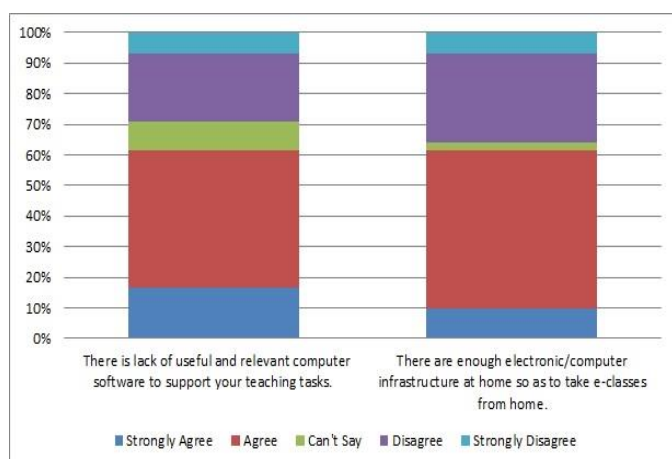


Fig. 15. Teacher's perspective – Infrastructure

Fig 15 suggests that most of the teachers have the e-learning hardware infrastructure at home to conduct classes like laptop/Desktop, webcam, etc but at the same time they feel that there is useful and relevant computer software are not available. So the institute must provide training in

appropriate software so as to facilitate the online class mode.

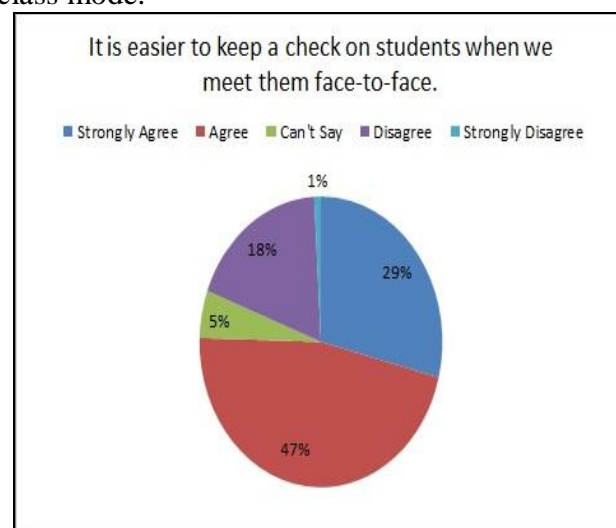


Fig. 16. Teacher's perspective – offline teaching

Fig 16 very clearly points out that despite all the tools, support staff, feasibility, teachers agree that it is easy to keep a check on students in offline mode as compared to online mode.

And hence the need for blended mode of learning in higher education institutes, as suggested by this study.

3. Conclusion

Proposed Blended Learning Model

On the basis of analysis of above two research studies done discussing the students' perspective and teachers perspective towards online classes, this study suggests the following blended learning model that can be used in higher education institutes. This blended learning model captures the advantages and problems faced by the students and teachers.

This model suggests conducting 60% of the total number of classes during the semester in offline mode and 40% in online mode.

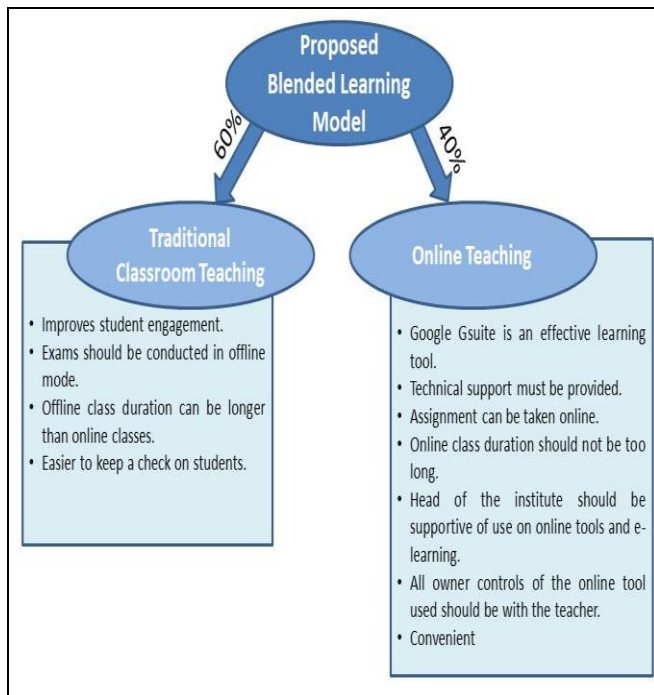


Fig. 17. Proposed Blended Learning Model

The key features to be included in the blended learning model –

a) Teacher's Role in proposed blended learning model

- Google Suite is an effective mode of online teaching.
- Google classroom and google meet effective tools for sharing study material and conducting live online classes respectively.
- Teachers must create a bond with students during offline classes to achieve better engagement during online classes.
- Teachers must be supportive to solve students queries from online teaching.
- Teachers must encourage discussion with students during online classes to increase effectiveness of the class.
- Teachers must help students by identifying and providing appropriate and online resources and reading material.
- Teacher and students should switch-on their video and audio during online class for sometime to make up for the physical presence.
- The teacher must understand all the google meet organizer rights given by the institute to the teacher to control the mischievous students during online classes.
- Class duration should not be too long. It is proven that it is difficult for the students to

maintain concentration for a very long period of time during online classes.

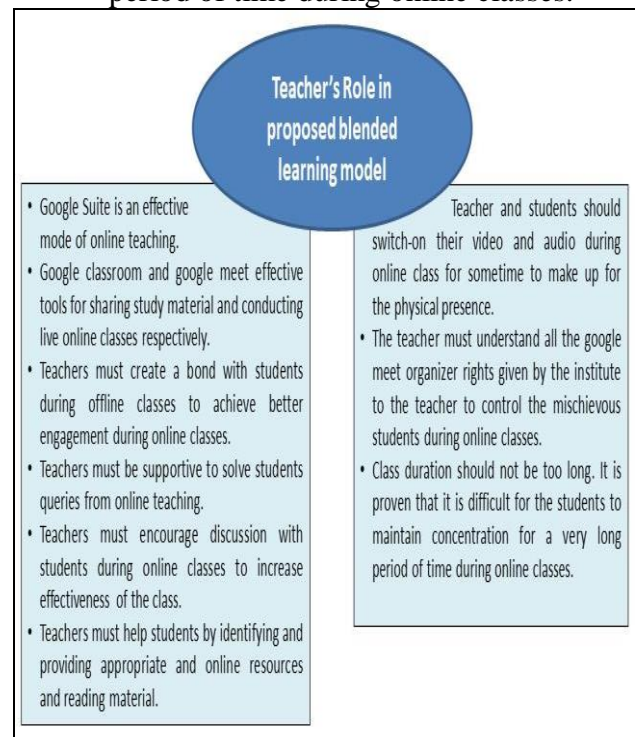


Fig. 18. Teacher's role in proposed Blended Learning Model

b) Students's Role in proposed blended learning model

- Students must create a bond with teachers during offline classes to achieve better engagement during online classes.
- Students should feel free to contact their teachers and technical support staff for any technical/course related problem.
- Students should try and make online classes interactive by relevant questions. The best way to learn is discussion with your teachers and peers.
- Teacher and students should switch-on their video and audio during online class for sometime to make up for the physical presence.
- Too much information online can be hazardous. Students should get in touch with their teachers for choosing useful e-resources.

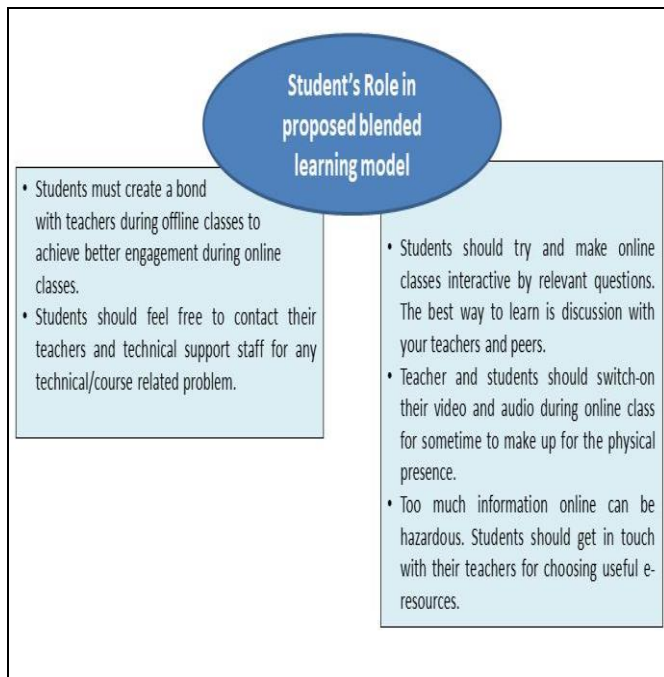


Fig. 19. Student's role in proposed Blended Learning Model

c) Institute's Role in proposed blended learning model

- Institute should buy educational Gsuite domain for their teachers and students.
- Institutes should employ technical staff to have good (student+teacher) : technical staff ratio.
- Institute must organize small group teacher-student meetings to improve engagement during online classes.
- Institutes must have a prompt technical support system.
- Institute must conduct training for teachers and students to apprise them of new technology for conducting and attending online classes.
- Institute must provide computer hardware infrastructure support to teachers and students.
- Institute must buy teaching resources of books to facilitate online teaching for its teachers.
- Assignment evaluation should be conducted online whereas exams must be conducted offline.
- An unlimited high bandwidth internet support should be provided to teachers and students.
- Online and offline classes should be conducted as per the given schedule to maintain routine.

- Institution must give google meet organizer rights to the teacher to control the mischievous students during online classes.
- The technical tools used for online teaching should not be too complex or difficult to learn and use.
- Head of the institute should be supportive of use on online tools and e-learning.
- Institutes must provide membership of journals to their teachers so that they can share appropriate e-resources with their students.

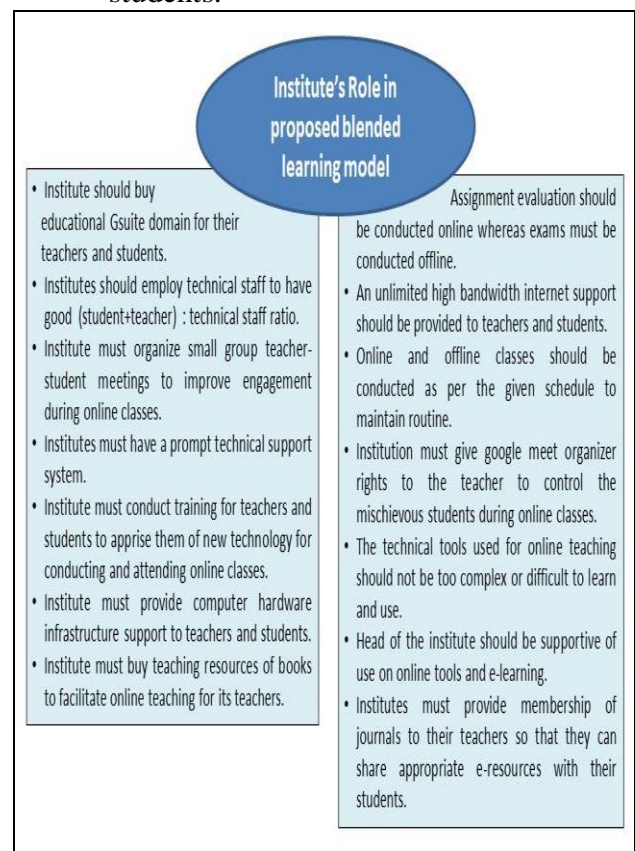


Fig. 20. Institution's role in proposed Blended Learning Model

In the blended learning content creation plays a very important role and preparation of the lectures beforehand is all the more important. In this scenario when we talk about offline and online teaching to be combined then we have to seek support of online teaching systems. Different kind of learning management systems, different online teaching notes, we can also think of a new measurement tools, we can also incorporate simulations, practical aspects, problem solving, case study methods, discussion methods. we can also share the study material or content beforehand which the students can study before

entering into the class and when they entered into the class, they should require to have obtained a minimum score and after that the discussion of the live sessions must stress upon the practical learning or the live projects which can be combined by offline teaching. This way blended learning mode can be more effective where in teachers can disseminate the capability in the students. By evoking emotions in the student's, Mentors/teachers can improve the thinking capability and analytical skills of the students. Adoption of offline and online teaching combined, different modes can be very helpful in the blended learning model.

4. Future Study and Scope

- This study could not analyze conclusively from teachers or students perspective if practical subjects can be taught in online mode effectively or not. That can be researched as a completely separate study.
- Subjects can be researched separately about which online tools can be specifically effective for languages or mathematics or science subjects, etc.

REFERENCES

- [1] Abeer Ali Okaz, Integrating Blended Learning in Higher Education ,Procedia - Social and Behavioral Sciences 186 (2015), pg. 600 – 603
- [2] Ali, M. F., Joyes, G., & Ellison, L. (2014). Building effective small-group team working skill through blended learning at Malaysia Tertiary Institution. *Procedia-Social and Behavioral Sciences*, 112, 997-1009.
- [3] Baldwin-Evans, K., 2006. Key steps to implementing a successful blended learning strategy. *Industrial and commercial training*, 38(3), pg.156-163.
- [4] Bodovski, K. and Farkas, G., 2007. Mathematics growth in early elementary school: The roles of beginning knowledge, student engagement, and instruction. *The Elementary School Journal*, 108(2), pg.115-130.
- [5] Boelens, R., De Wever, B., & Voet, M. (2017). Four key challenges to the design of blended learning: A systematic literature review. *Educational Research Review*, 22, 1–18. <https://doi.org/10.1016/j.edurev.2017.06.001>.
- [6] Bonk, C.J., Kim, K.J. and Zeng, T., 2005, June. Future directions of blended learning in higher education and workplace learning settings. In *EdMedia: World Conference on Educational Media and Technology* (pp. 3644-3649). Association for the Advancement of Computing in Education (AACE).
- [7] Borba, M.C., Askar, P., Engelbrecht, J., Gadanidis, G., Llinares, S. and Aguilar, M.S., 2016. Blended learning, e-learning and mobile learning in mathematics education. *ZDM*, 48(5), pp.589-610.
- [8] Browne, T., Hewitt, R., Jenkins, M. and Walker, R., 2008. 2008 Survey of Technology Enhanced Learning for higher education in the UK. UCISA.
- [9] Catalano, H. (2014). The opportunity of blended-learning training programs in adult education-Ascertaining study. *Procedia-Social and Behavioral Sciences*, 142, 762-768.
- [10] Chan, Y. F., Narasuman, S., Dalim, S. F., Sidhu, G. K., & Lee, L. F. (2016). Blended learning as a conduit for inquiry-based instruction, active learning, formative assessment and its impact on students' learning outcomes in higher education. :74–78.
- [11] Cummings, C., Mason, D., Shelton, K., & Baur, K. (2017). Active learning strategies for online and blended learning environments. In *Flipped Instruction: Breakthroughs in Research and Practice* (pp. 88–114). IGI Global.
- [12] Dziuban, C.D., Hartman, J.L. and Moskal, P.D., 2004. Blended learning EDUCAUSE Centre for Applied Research: Research Bulletin.
- [13] Engelbertink, M.M.J., Kelders, S.M., Woudt-Mittendorff, K.M. et al. Participatory design of persuasive technology in a blended learning course: A

- qualitative study. *Educ Inf Technol* 25, 4115–4138 (2020).
- [14] Garrison, D.R. and Vaughan, N.D., 2008. *Blended learning in higher education: Framework, principles, and guidelines*. John Wiley & Sons.
- [15] Graham, C.R., 2006. *Blended learning systems*. The handbook of blended learning, pp.3-21.
- [16] Heflin, H., Shewmaker, J. and Nguyen, J., 2017. Impact of mobile technology on student attitudes, engagement, and learning. *Computers & Education*, 107, pp.91-99.
- [17] Hoic-Bozic, N., Dlab, M. H., & Mornar, V. (2016). Recommender system and web 2.0 tools to enhance a blended learning model. *IEEE Transactions on Education*, 59(1), 39–44.
- [18] Hubackova, S., & Semradova, I. (2016). Evaluation of blended learning. *Procedia-Social and Behavioral Sciences*, 217, 551-557.
- [19] Kintu, M. J., & Zhu, C. (2016). Student characteristics and learning outcomes in a blended learning environment intervention in a Ugandan University. *Electronic Journal of e-Learning*, 14(3), 181–195.
- [20] Manwaring, K. C., Larsen, R., Graham, C. R., Henrie, C. R., & Halverson, L. R., 2017. Investigating student engagement in blended learning settings using experience sampling and structural equation modeling. *The Internet and Higher Education*, 35, 21-33.
- [21] Mitchell, A. and Honore, S., 2007. Criteria for successful blended learning, *Industrial and Commercial Training*, Vol. 39, No. 3, pg 143-9.
- [22] Monk, E. F., Guidry, K. R., Pusecker, K. L., & Ilvento, T. W. (2020). Blended learning in computing education: it's here but does it work? *Education and Information Technologies*, 25, 83–104.
- [23] Moskal, P., Dziuban, C., & Hartman, J., 2013. Blended learning: A dangerous idea?. *The Internet and Higher Education*, 18, pg. 15-23.
- [24] Porter, W. W., Graham, C. R., Spring, K. A., & Welch, K. R., 2014. Blended learning in higher education: Institutional adoption and implementation. *Computers & Education*, 75, 185-195.
- [25] www.raiseyourhandtexas.org/blended-learning/understanding-different-models-blended-learning/
- [26] Thongmak, M. , 2013. Social network system in classroom: Antecedents of edmodo© adoption. *Journal of e-Learning and Higher Education*, 2013(1), 1-15.
- [27] Vaughan, N., 2014. Student engagement and blended learning: Making the assessment connection. *Education Sciences*, 4(4), 247-264.
- [28] Venkatesh, V., Croteau, A.-M., & Rabah, J. (2014). Perceptions of effectiveness of instructional uses of technology in higher education in an era of Web 2.0. Paper presented at 2014 47th Hawaii international Conference on the System Sciences (HICSS)
- [29] Wai, C. C., & Seng, E. L. K. (2014). Exploring the effectiveness and efficiency of blended learning tools in a school of business. *Procedia-Social and Behavioral Sciences*, 123, 470-476.
- [30] Wardani, D. K., Martono, T., Pratomo, L. C., Rusydi, D. S., & Kusuma, D. H. (2018). Online learning in higher education to encourage critical thinking skills in the 21st century. *International Journal of Educational Research Review*, 4(2), 146-153.