

# Implementing a Social Learning Ecosystem for Engineering Education: A Case Study

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## ABSTRACT

Social Learning occurs when students interact amongst themselves as a community of networked learners and this is an important component of the process of education. Modern developments in communication technology now make it possible for students to engage with each other and with their teachers beyond class-room walls through electronic media without constraints of location or time. This paper presents a case study of the implementation and practice of social learning process at the BMS College of Engineering (BMSCE) through the use of a Technology Enabled Social Learning (TESL) platform that facilitates ubiquitous engagement among the student community. Challenges in the implementation and practice of the social learning process in institutions of higher learning are discussed and results are presented of various social learning metrics to bring out the growth in students' active engagement in learning through the use of the TESL platform.

**Keywords:** Technology Enabled Social Learning, Informal Learning, Social Learning Analytics.

## INTRODUCTION

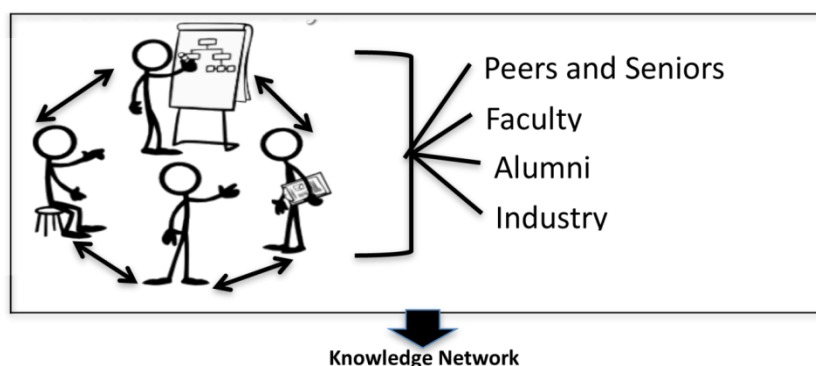
Developments in Information and Communication Technology (ICT) now enable us to address the demand for education by the large community of students through online courses and their delivery by various modes. However, the application of ICT has so far focused more on provisioning of knowledge contents and their delivery. The use of such online education to supplement traditional class-room lectures does not however solve the problem of reduced teacher-student or student-student engagement.

Learning often happens amongst students when they interact amongst themselves as a community of networked learners[1]. Such a learning process, also referred to as Social Learning, is a critical component of the process of education. Developments in ICT now make it possible for students to engage with each other and with their teachers beyond the class-room walls through electronic media without the constraints of location or time. A Technology Enabled Social Learning [TESL] platform[2] that facilitates ubiquitous engagement among the students, developed by Wiksate Solutions Private Limited (WIKSATE) became available in 2014 and this motivated the BMS College of Engineering (BMSCE) to introduce a TESL ecosystem for enhancing the students' learning. Since then, BMSCE, with active Beta partnership of WIKSATE, launched the induction of

social Learning for a number of courses in different departments for different batches in the engineering programme. This paper presents a case study of the implementation and practice of Social Learning in BMSCE during the last three years. Results of social interaction analytics are presented to bring out the steady growth in student interactions focused on various topics across disciplines and its impact on the learning process.

## THE SOCIAL LEARNING PROCESS

Figure 1 shows a schematic of how social learning happens when students in a knowledge network engage with each other and their teachers as a community of learners.



**Fig. 1:** Schematic of a Social Learning Knowledge Network

The learning process of students as members of a network of learners involves, connecting and sharing the information acquired with other members of the community as well as responding to (questioning/commenting/correcting/acknowledging) such information shared by other members of the network. This collective process of discussion and reflection helps the community of learners to convert the information shared into curated knowledge and create knowledge networks. Often, the knowledge network is contextual to the geography of the institute. For example, learners from a particular institute often tend to create knowledge networks with their seniors and alumni who can provide contextual value to the institute students. This knowledge can be retained and form part of the institute's learning footprint.

The use of ICT and modern communication media can enable learners to have efficient and sustained interactions with their peers as well as with a wider cohort of learners and experts to create several knowledge networks of significant practical value.

## THE TESL ECOSYSTEM - OBJECTIVES

BMSCE in partnership with WIKSATE commenced a series of experiments to implement social learning practices using the TESL platform for a limited set of branches and students over a period starting February 2013. The common vision statement for the project was "to create active engaged learners". The specific objectives of the experiment were to (i) promote "Informal Learning" among students and (ii) provide faculty with real-time data from closed loop analytics to measure and improve delivery and support processes.

The approach was to focus on about 5 departments in the first 6 months and grow it across all departments beyond that period. The experiment covered over 2000 students, over 40 courses, 20 faculty and 11 programmes.

### TESL IMPLEMENTATION

Educational institutes face numerous challenges in dealing with the vast population of students. Whilst technology used appropriately can deliver efficiencies and free up faculty time significantly to focus on their core responsibility, it's often the adoption and transformation processes that ensure essential uptake of technology based automation. Implementing a TESL ecosystem in a large educational institution requires the motivation and involvement of faculty to interact with students beyond their class-room lectures and contact hours, through communication media[3]. Faculty participation in the social learning ecosystem, over and above their traditional responsibilities to academic programmes, requires personal motivation as well as institutional support and encouragement. Building such an ecosystem requires all levels of the institute to co-opt and participate to ensure that the initiative shows successful growth during the formative years. An administrative structure for the induction of the TESL ecosystem was established and responsibilities were assigned to faculty identified as “transformational faculty” who as learning champions, facilitated and moderated student interactions. Student champions were identified, who as transformation agents catalysed the involvement of other students in social interactions related to various discussion groups and courses. This approach helped realise transformation in phases through a three-tier implementation and communication set-up as shown in Figure 2.

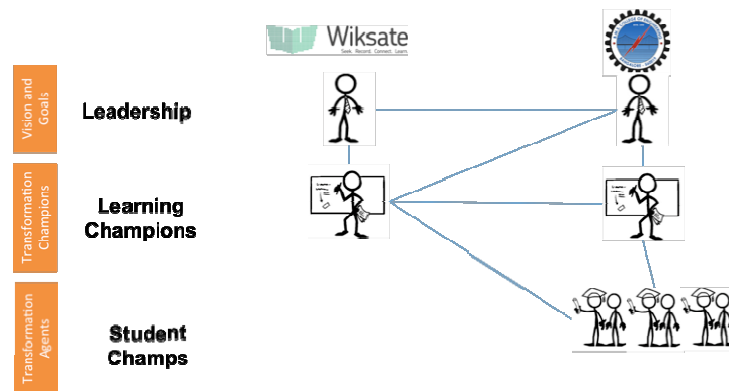


Fig. 2: Three -Tier Implementation of the TESL Ecosystem

### TESL ECOSYSTEM – TECHNOLOGY AND PRACTICE

The TESL platform is a web-based interaction engine designed to be accessed through various communication media. Ubiquitous connectivity is provided by enabling access through personal computers, laptops, tablets and smart mobile[4] phones. These account for and support student preferences to adopt these gadgets as principal consumption interfaces of knowledge.

Entwining social learning into curriculum delivery can greatly improve engagement and interactions. Real time interactions provide extensive insights into student learning patterns, behaviours and

preferences. Real time interventions provide a greater ability to manage “students@risk” and improve their learning experiences.

Student interactions are multidisciplinary and there is a significant inclination towards peripheral learning areas outside the curriculum. Supplementing the learning journey of students in certain learning groups that have more student demand and interest, promote an open learning culture. The TESL platform also facilitates asynchronous communication empowering students to have social interaction round the clock.

The analytics features available in the TESL platform to measure student engagements and movements in real-time provide feedback to faculty so that they can device intervention and continuous improvement measures during course delivery on an ongoing basis.

### SOME RESULTS OF THE CASE STUDY

The implementation of the social learning ecosystem was very successful in realising the goals set forth. Some representative data are presented here to bring out the quantitative and qualitative features of growth of social learning at BMSCE.

Figure 3 shows the growth of “Key Social Learning Parameters”. It was observed that the growth of subscriptions to social learning groups was organic and unenforced. Growth is also attributed to students and faculty getting comfortable with the functions and features of the platform. It was also observed that the learning groups grew over a period of time. Students formed multi- disciplinary groups to cross share and build knowledge. This had a cascading effect leading to growth in interactions and learning reach. The results given below, sum up the growth of social learning over the period of three years.

- 4000+ learnings
- 2100+ learners
- 45% “active learners” (engagement)
- 50,000+ interactions

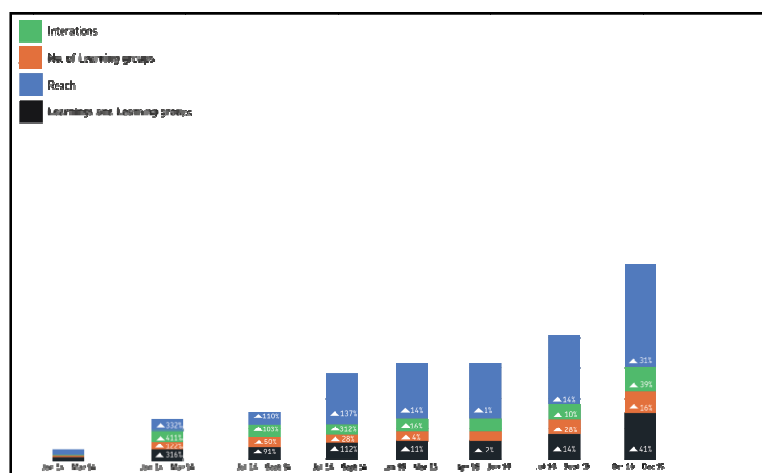


Fig. 3: Growth of Key Social Learning Parameters

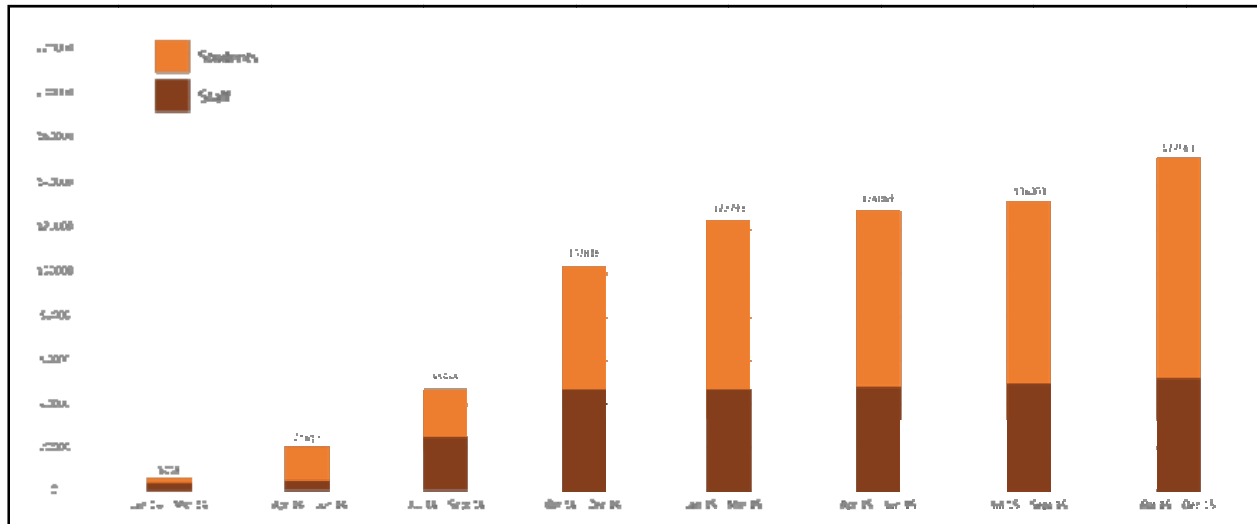


Fig. 4: Growth of the Faculty and Student Sharings

Figure 4 shows the growth of faculty and student sharings (Reach) over the period 2014-15. Reach is a measure of how learning permeates to an individual or a group of students within an ecosystem. In the first half of the induction period, faculty led the way in creating and permeating learnings. Second half indicates a gradual shift of reach from faculty to students.

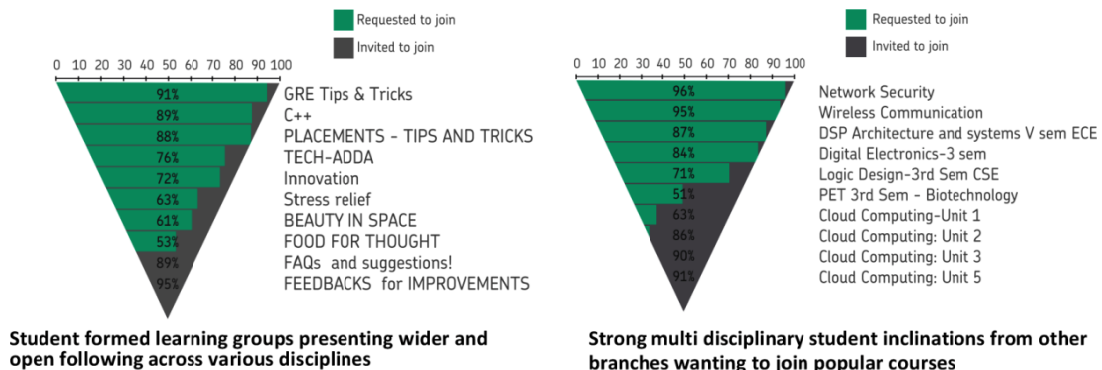


Fig. 5: Popular Special Interest Groups

The graphics presented in Figure 5 show how special interest groups attract students to join and contribute. The green bars indicate student inquisitiveness/interest to join these groups and interact. Students from various disciplines joined course and non-course groups. These results provide visibility to the open social learning culture among the students.

Figure 6 shows a breakup of student media preferences. It also shows a course-wise break-up to identify courses that generate the specific media type of social learning activity. Higher consumption of specific media indicates student preferences of media type. For instance, “Thermodynamics” showed a high preference to video based learning objects. Thus, these analytics provide significant insights into student preferences and dispositions in relation to subject and course related content.

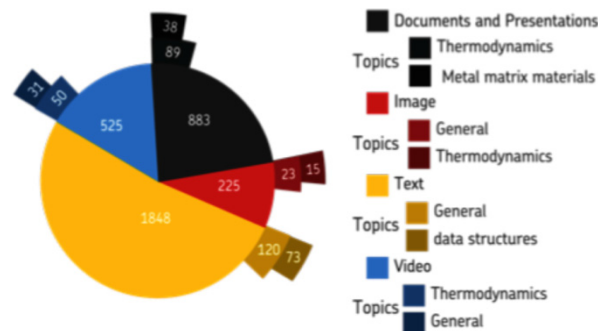


Fig. 6: Learning Media Preferences

Figure 7 provides an interesting picture of the interaction behaviours in terms of the biological clock patterns of students and faculty. It shows that “active engaged learning” happens round the clock among the student community.

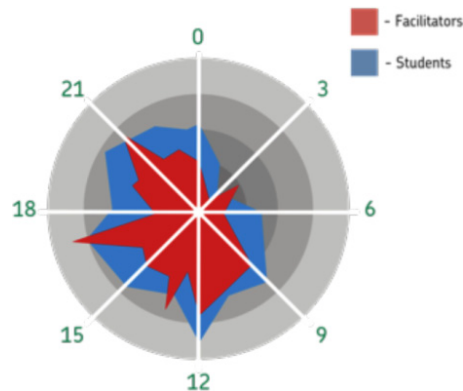


Fig. 7: Distribution Interaction Pattern of Social Learning over 24x7x365

## CONCLUSIONS

The present project on building a technology enabled social learning ecosystem at BMSCE was a transformational activity. Its successful realization was made possible by the involvement and motivation at all levels of the educational institute, namely management, faculty and students. The WIKSATE TESL platform provided (i) a powerful interaction engine for students to interact and share their learnings with their co-learners in a knowledge network and (ii) real-time data to faculty which give insight into student preferences and engagement and help plan continuous improvements in the course delivery and outcome. It also helped promoting a culture of openness and moderated learning providing a vital bridge to close the gap between educators and students.

The results from TESL analytics show that students have a natural motivation and inquisitiveness to get involved in interactions when empowered by ICT and a mobile centric ubiquitous access to knowledge networks. The results also show a steady growth of interactions at all levels, which highlights the importance of ‘practice’ as a critical component besides ‘technology’, in the induction of social learning ecosystem in an institutional environment.

## ACKNOWLEDGEMENTS

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## REFERENCES

- [1] Lone Dirckinck-Holmfeld, Vivien Hodgson, David McConnell (Editors) "Exploring the Theory, Pedagogy and Practice of Networked Learning" Research in Networked Learning" Book Series, Springer, 2011
- [2] G. Gopalakrishnan, S Girish, S Suryanarayan " An Interaction Engine for Intelligent Social Learning", White paper 2014 -1, Wiksate Solutions Pvt Ltd., Pune, India.
- [3] Babu, K.; Kanmani, B.; Gopalakrishnan, G.; Girish, S.; Suryanarayan, S. "Improvement of learning outcome and its measurement using social learning intelligence", International Conference on Interactive Collaborative Learning (ICL), WEEF Dubai, p 459-463, December 3 to 6, 2014.
- [4] G. Gopalakrishnan, S Girish "Mobile-centric Ubiquitous Access to Social Learning", White paper 2015-2, Wiksate Solutions Pvt Ltd., Pune, India.
- [5] Babu, K.; Kanmani, B.; Gopalakrishnan, G.; Girish, S.; Suryanarayan, S *Social Learning Intelligence*. 2016. Web. Available: [https://www.youtube.com/watch?v=N82u\\_WK1Yxs](https://www.youtube.com/watch?v=N82u_WK1Yxs) 1 Jan. 2015.

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