

Mathematics Teaching, Learning and Assessment using Latest ICT tend Social Media

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***Abstract:** ICT stands for "Information and Communication Technologies." it refers to technologies that provide access to information through telecommunications. It is similar to Information Technology (IT), but focuses primarily on communication technologies. This includes the Internet, wireless networks, cell phones, and other communication mediums. This paper initiates advanced ICT for learning and teaching mathematics through the Social media tools such as Face book, Twitter, YouTube, Geogebra ,Blogs and etc. This paper describes how it works, where it is going, and why it matters in an emerging country-India particularly. It also supports the teaching and learning community in developing ways to gather evidence of the impact of social media tools innovations and current practices on learning mathematics. There is already evidence that teachers are using social media to teach mathematics as part of teaching strategies, with the aim of encouraging students to view social networks as less of a pleasurable distraction. With this paper we are trying to integrate social media into the classroom, and focuses on the need to carefully review existing teaching strategies and understandings of social media before making changes. This paper aims that 'With today's computer and Information and Telecommunications technologies, every young person can have a quality and deep understanding of mathematical concepts in education regardless of his or her place of birth or wealth of parents in India.*

Keywords: Mathematics, Education, ICT Social Media, Face Book and Geogebra.

I.INTRODUCTION

Social Media is an interface between people who cannot be together actually but stay together virtually. It should be noted that opportunities for wide-ranging interactions between teachers and students .in general have always been part of the practice of teaching. The capacity to speak either face-to face or by phone, for example, is part of a scaffold learning experience offered by many teachers of day and distance students. What is different here is the technology, and its implications for education.

Many higher education institutions (For Example Fig1, Fig 2) are discovering that new models of teaching and learning mathematics are required to meet the needs of a generation of learners who seek greater freedom and connectivity as well opportunities for socio-experiential learning. In contrast to earlier e-learning approaches that simply replaced traditional models. It opportunities to

move away from the last century's highly centralized, industrial model of learning and toward individual learner empowerment through designs that focus on collaborative, networked interaction. Such developments are providing the foundations for and shaping the contours of a new learning landscape in India, Social Media tools that support knowledge sharing, peer-to-peer networking, and access to a global audience with learning approaches to facilitate greater learner autonomy, agency, and personalization.



Fig 1



Fig 2

According to the eMarketer;

India; Internet users who use a social network site via any device at least once per month. Number of social network users estimated in India 2017 is 282.90(in millions) where in 2013 is 127.50(in millions)

II.METERIAL AND METHODS

A Survey conducted on Social media and open source, we have listed below and explained few top social media and Open source tools which are mostly using by the students and lecturers to learn and teach mathematics respectively

1. **Face book-Social network educational tool**
2. **Blogs-Blogging tool**
3. **Learners TV-Free Online Video Lecture Courses on various subjects**
4. **YouTubeEDU-Brings learners and educators together in a global video classroom.**
5. **Geogebra - Mathematics software for schools and higher Edu**
6. **Khan Academy - Learning platform**

1.Learners Tv:

Learners Tv is a great educational video resource for students and teachers. It basically provides video lectures covering different topics and subjects. Among the covered subjects are: Biology, physics, mathematics, statistics, computer science, medicine, dentistry, engineering, accounting, and management. Lectures are organized into labels and tagged in such a way that makes it easy for you to navigate and browse categories you want.

The mathematics lectures provided by Learners TV are both in audio and video format. They cover whole courses conducted by faculty from reputed universities around the world. The purpose of this website is to

- Help students in their learning
- Create autonomous and independent learning behavior
- Sharpen students critical thinking skills
- Provide students with fun and innovative ways of learning
- Refine students test taking skills

Wednesday, July 10, 2013:

The total number of Video Lectures: **30742** Live Animations: **410** PowerPoint Presentations:

The total number of mathematics video lectures is uploaded till 10 July 2013 are 5440

The estimated 5,710 daily visitors each view 4.50 pages on average. It is most popular in Houston, Bangalore, Delhi, Jaipur & Karachi. It is most popular in the countries, Canada, United States, India, Morocco, Egypt & Pakistan.

Table 1. Countrywide Learners TV Users

Country	Country Rank	Users %	Pageviews %
Other countries		20.90%	22.40%
Pakistan	10,823	6.70%	8.50%
Egypt	12,739	1.30%	2.50%
Morocco	15,295	0.50%	0.70%
India	22,614	23.50%	23.10%
United States	23,776	31.40%	34.10%
Canada	29,435	5.40%	1.40%
Iran	29,746	1.40%	1.40%
Australia	38,578	1.90%	1.30%
United Kingdom	57,600	3.10%	2.80%
France	63,911	3.20%	1.50%
Turkey	76,649	0.80%	0.40%

2.Face Book:

Face book is an online social networking service, whose name stems from the colloquial name for the book given to students at the start of the academic year by some university administrations in the United States to help students get to know each other. It was founded in February 2004 by Mark Zuckerberg with his college roommates and fellow Harvard University students Eduardo Saverin, Andrew McCollum, Dustin Moskowitz and Chris Hughes. The website's membership was initially limited by the founders to Harvard students, but was expanded to other colleges in the Boston area, the Ivy League, and Stanford University

The Times Of India Jun 16, 2013, 01.02pm Ist

Harnessing the power of internet, about 75% of India's youth prefers social media over phone calls to communicate, with more students using the net for school-related tasks, says a TCS survey.

The findings, a part of Tata Consultancy Services (TCS) Gen-Y survey 2012-13, reveal that today's youth are collaborating through social networking tools and building virtual communities aided by affordable bandwidth and smart devices.

According to the wikipedia.org, INDIA placed second largest users of face book in the world after US

According another survey report on 12-07-2012 ,there are 84,00,000 face book users from India

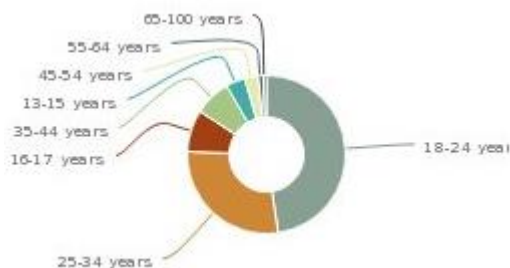


Fig 1.The number of face book users in India

The following table illustrates us to teach or learn mathematics we have listed a few face book links which we may use,

Table 1.2 Mathematical Links from Facebook

Name of the resource	Useful link
IIT Bombay	https://www.facebook.com/pages/Maths-and-Physics-Club-IIT-Bombay/207906392599027
IIT Roorke	https://www.facebook.com/pages/Department-of-Mathematics-IITRoorkee/127246127330880
UGC-CSIR-Net-JRF Exams	https://www.facebook.com/csirnetexam
Association of Mathematics Teacher Educators	https://www.facebook.com/AMTE.net

Advantages of the use of Face book in education:

Here are some of the benefits you may harvest from your effective use of Face book with your students:

- Relaxed, friendly and inviting atmosphere which encourages students participation and engagement
- Students feel comfortable learning through Face book because most of them use it everyday
- Face book can promote collaboration and social interchange between participants
- Students get engaged about their learning outside the classroom

Face Book tips for teachers to teach:

Here are some important tips that teachers need to keep in mind when using Face book with their students:

- We(Tutors) should create a separate account just for their classes
- Manage your privacy settings to keep your professional and private lives separate.
- We need to be diligent about policing what kind of photos are shared on Face book
- We need to give clear instructions to students on the kind of stuff to be shared on Face book
- Always engage in civil and respectful debates.
- Use Face book 's flexible privacy settings to pick and choose who can see what on a profile page
- Teachers can set up a private class group to communicate with students
- If we have a classroom blog you can import it to Face book for students to stay updated right from their profiles
- Remind students to police themselves online. Students do better when they feel they are responsible for their learning
- The last tip is to always stay engaged. Try to remain so even if the class is a poor fit.
- Create a group for your class and strengthen the communication between you and your students. Check this handout to learn how to create your class group on Face book.
- Schedule events for the entire class.
- Use message utility in Face book to message your students about unexpected absences, rescheduling of exams...etc.,
- Share mathematics multimedia content like videos, photos, clips and more with your entire class.
- Post class notes for students to review in case they were absent
- Try to involve students who are normally shy in the classroom
- Facilitate classroom connections through letting students know each other more. This is particularly helpful in large classes.
- Use Face book to send reminders, announcements, upcoming due dates or any other classroom news.
- Sharing online content with students such as interesting websites, blogs, wikis, and more

- Add educational applications to your Face book group. Scroll down for a list of such applications.
- Encourage students to post content of mathematics their own such as videos, images, news stories and other media that relate back to their lessons.
- Look for other classrooms online that are willing to collaborate on educational projects, assignments and discussions.
- Use the events section to remind students of the upcoming field trips

3.Geogebra:

Markus Hohenwarter created free mathematics software GeoGebra, which is used for both teaching and learning mathematics from the school level through college to the University level .This tool extends the concepts of dynamic geometry to the fields of algebra and mathematical analysis.Numerous research results suggest that these software packages can be used to encourage discovery, experimentation and visualization in traditional teaching of mathematics. However, researches suggest that, for the majority of teachers, the main problem is how to provide the technology necessary for the successful integration of technology into teaching. GeoGebra was created to help students gain a better understanding of mathematics. Students can manipulate variables easily by simply dragging free objects around the plane of drawing, or by using sliders. Students can generate changes using a technique of manipulating free objects, and then they can learn how the dependent objects will be affected. In this way, students have the opportunity to solve problems by investigating mathematical relations dynamically.

Geogebra is Innovative in mathematics teaching and learning tool:

1. Combination of elements of
 - a)dynamic geometry software (Sketchpad, Cabri)
 - b)computer algebra systems (Derive, Maple)
2. High technical portability
 - a) GeoGebra is fully platform independent (Windows, MacOS, Solaris, Linux)
 - b) Dynamic worksheets (html)
3. Graphing Calculators
4. Drawing Tool
 - a) Geometric drawings for handouts & activities
 - b) Graphs for worksheets, quizzes & tests
5. In-class Presentation Tool
 - a) Dynamically show relationships
 - b)Visualization of abstract concepts
6. Authoring Tool (Web Export)
 - a)Interactive virtual manipulative
 - b) Exploratory mathematics

Geogebra is a tool that provides us abstract of mathematics, to connecting different areas of mathematics and to expertise and discover on it

According to the recent statistics conducted by national Geogebra Institute on Feb 2013

Table1.3 Geogebra Usage Age wise

Age	Geogebra Usage
6-10	Adding integers
11-14	Angle (girl in Mirror)
14-17	Function composition
17 and above	Spread sheets and calculus

Table 1.4 World Wide Geogebra Users

Worldwide Geogebra Users	
<ul style="list-style-type: none">• 50 Languages• 190 Countries• 130 Institutes• 43 Developers• 200 Translators• 25000 Online Learning Subjects	<ul style="list-style-type: none">• 1,00,000 Unique Visitors/Month• 50000 Downloads /Month• 8 Million Downloads In 2012• 20 Million Users Estimated

4.Blog:

A blog is a Web page that serves as a publicly accessible personal journal for an individual. Typically updated daily, blogs often reflect the personality of the author. This page describes the term **blog** and lists other pages on the Web where you can find additional information. It allows users to create their own blog with beautiful customized templates at free of cost. Free weblog publishing tool from Google, for sharing text, photos and video. In our college we have created a mathematics blog named pmat07.blogspot.in with the help of Google Docs or Drives and a little bit of HTML knowledge. In this we share and publish notes on the website. So, every student can access the material and then can also leave the message. Start a class blog with simple announcements, homework, assignments, Tutorials, and external links. To differentiate, the advantage is that it allows easy filtering of content for various presentations: by date, category, author, or other attributes.

5.YouTubeEDU:

YouTube EDU brings learners and educators together in a global video classroom more essential for mathematics and physics specially to see the geometrical approach. On YouTube EDU, you have access to a broad set of educational videos that range from academic lectures from different areas in the world and everything we can see here for quick lessons from top teachers around the world, course lectures from top-tier universities, or inspiring videos to spark your imagination.

The main features we can learn from YouTube EDU are

- Learn
- Create
- Teach
- YouTube for Schools and Higher Education

With the help of YouTubeEDU, we can Educate, engage, and inspire your students with video. Sign up for free of cost to YouTubeEDU to bring the power of video to your classrooms for free. Access thousands of free high quality of mathematical videos on YouTube in a controlled environment. The url for mathematics video classes

<http://www.youtube.com/education?category=University/Mathematics>

Table 2.Number of Videos Uploaded In YouTube EDU

Name Of The Video Browser	Number Of Videos Uploaded	Number Of Views
KHANACADEMY	3,581	14,541,659
NPTELHRD	12,670	9,871,239
UCBERKELEY	5,843	7,212,250
MIT	2,753	5,939,672

III.IMPLEMENTATION AND RESULTS

The activity

We have a blog applied at the Vignana Bharathi Institute of Technology. Blog is a Web tool that can be used to set-up a private social networking site – i.e. an online community where members can set-up ‘profiles’ to define themselves and make friends. Here, we could utilise the interactive and collaborative features of a social networking site, but create a definite educational learning space away from the students’ personal social networking sites. The site would be used to discuss aspects of the course being studied. It took a few minutes for us to set-up own Blog site. The College filter (or firewall) blocked third party advertising on the site. Students found the site easy to use, as it looked very similar to social networking sites they were already using. Students set-up their own profiles, complete with pictures, music and text, outlining their personal interests. Ground rules were agreed on how to use the site, including the kind of language to be use and whether it was okay to have spelling mistakes.

The outcomes

The students used blog to discuss the course. They worked together without copying each other.The forum on the site develops a story of the student learning experience, from basic comments such as “This lesson is boring...” to viewing full group discussions. Another outcome has been discussion and collaboration across year groups; conversations move into the real world, where B.Tech Year 1 and Year 2 students begin interacting with one another where, perhaps, they would not have done before.

The impact

We note that the students relished ‘creating themselves’ in their profiles. Importantly, it gives a voice to quieter members of class. The site raised some interesting discussion, particularly when one member of the group interested in rap culture uploaded images of guns on his profile page. This led to an ethical debate on whether this was acceptable. Similarly, The tutor polices the site as a last resort, in a similar way to what happens in the classroom. It is recognised that, as all users are post-16 learners, the issue of the dissemination of personal information is less pressing than it would be for students under 16. The site is private to the group, but all students realise that their information is visible to everyone else in the group. Blog is not on its own within the College’s teaching methods. It is simply part of the general communications, The future of the project is to keep pushing the pilot with the IT group and then try with other groups in the College. In order for this to be embraced college-wide, there is a need to build-up the confidence of the teaching staff and ensure they do not feel like they will lose control. We plan to further

develop the idea by using a social network to create a community of college applicants, i.e. those who have applied to the College and are waiting to start. This will enable the College to keep in touch with the learners and the prospective students to start friendships before their first day. The methods involved are similar to those used in the classroom, but the perception of them is different. Ideally, the College does not realistically have the resources and, instead, can rely on the ever-developing nature of Blog itself.

IV.DISCUSSION AND CONCLUSION

The use of social media approaches enhanced learning and teaching experiences of mathematics students. Their use caused both the instructor and students to realize their roles in the course and behavior in the classroom had to change significantly. Although some may feel that incorporating social media approaches takes time away from important course topics like vectors analysis and geometry. They should see these as alternative ways to cover topics and even as a means for introducing additional topics. Using Social media we can have Communication, Public Relation, Intelligent adoption of social media tools can engage students in interactive learning, which is the key to a successful mathematical teaching and learning education.

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