

## **Adoption of Web 2.0 technology in higher education: A case study of universities in National Capital Region, India**

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### **ABSTRACT**

The present study was conducted in six (6) Indian Universities at NCR (National Capital Region) of India to explore the usage analysis of Web 2.0 technologies in learning environment by faculty members. The investigator conducted a survey with the help of structured questionnaire on 300 respondents. A total of 300 self-administered questionnaires (out of total population 693) were distributed among Professors, Associate Professors, and Assistant Professors of different streams and departments (Agriculture, Arts, Education, Engineering, Management and Science) by adopting stratified random sampling, 147 valid samples were collected and analyzed. Web 2.0 is especially useful and creative when knowledge is digitized, modular and allowed to be used and distributed in a flexible way. The application of the Web 2.0 tools in Indian higher education is still marginal and will have to overcome a lot of obstacles in order to hold its ground as in higher education of developed countries. The adoption of Web 2.0 tools at universities is associated with important challenges (potential risks, institutional fears) and an effective strategy to deal with implementation problems may therefore include learning from (others') experience, as well as open access to content and reliance on open platforms for knowledge sharing and creation. The majority of the faculty members have been using Web 2.0 tools for the three major purposes; for Web based teaching & research; for interactive learning features; and to keep themselves up to date on related topic of interest. The results indicate that the faculty attitude and their perceived behavioral control are strong predictors to their intention to use Web 2.0. This article reports on study that attempted to find out the usage of Web 2.0 tools (wiki's, blogs, RSS feed, collaborative writing, video sharing, social networks, etc.) by Indian faculties to support teaching and learning in higher education at NCR of India.

**Keywords:** *Web 2.0; Blogs; Wikis; RSS Feed; Podcasting and Social Bookmarking.*

### **INTRODUCTION**

The term Web 2.0 coined by technology commentator Tim O'Reilly describes the changing trends in the use of World Wide Web technology and Web Design that aim to enhance creativity, communications, secure information sharing, collaboration and functionality of the Web. Web 2.0 concepts have led to the development and evolution of Web culture communities and hosted services, such as social networking sites, video sharing sites, wikis, blogs, RSS feed, podcasting and others SNS, Mashup).

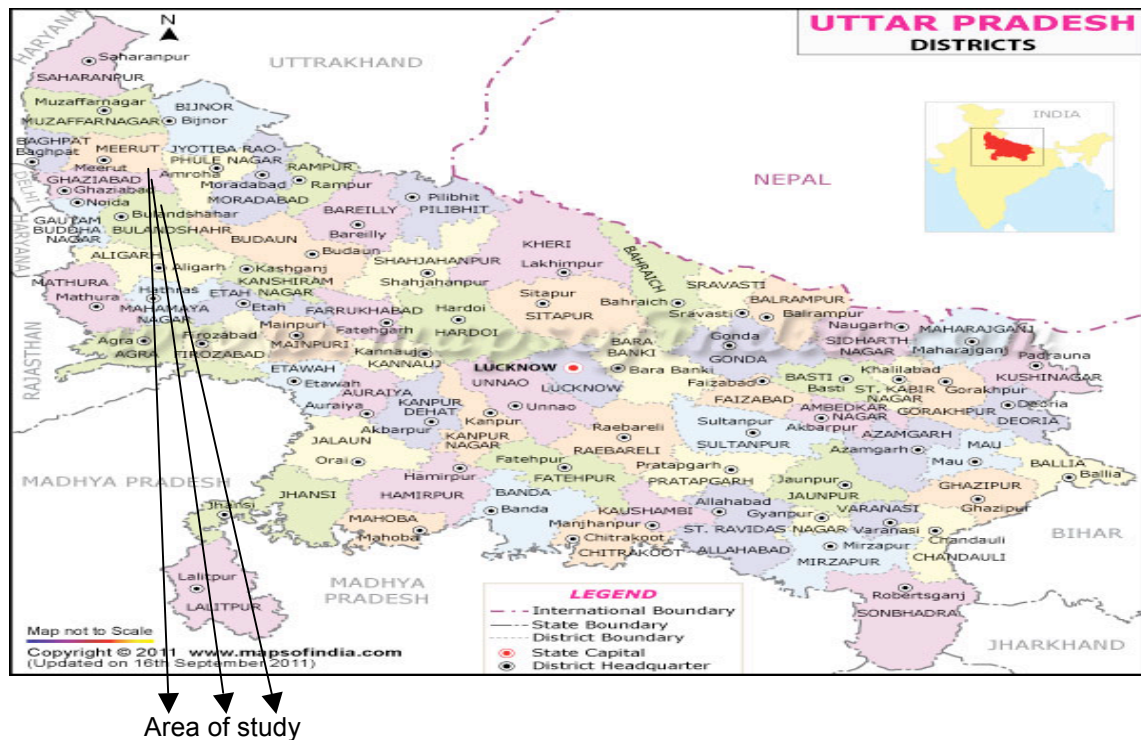
Web 2.0 is an emergent key driver changing learning paradigms at academic institutions. Besides technology, Web 2.0 challenges intellectual property and transform consumers in active users creating and curating knowledge. The use of Web 2.0 tools (wiki's, blogs, RSS feed, social networks, podcast etc.) can support innovative teaching methods and is associated with concepts like communities of practice, syndicated content, learning as a creative activity, peer-to-peer learning, creation of personal learning environments, and non-formal education (Bartolomé, 2008). Such tools can be used to develop Learning 2.0 strategies that can enhance student motivation, improve participation, facilitate learning and social skills, stimulate higher order cognitive skills, and increase self-directed learning (Redecker et al., 2009). However, in India until

now, universities have not made the needed efforts to adapt to the new needs of the network society and digital natives and immigrants studying and working there.

This article reports on study that attempted to find out the usage of Web 2.0 tools (wiki's, blogs, RSS feed, collaborative writing, video sharing, social networks, etc.) by Indian faculties to support teaching and learning in higher education at NCR of India. The study focuses the benefits of Web 2.0 tools in learning environment and contribution of Web 2.0 in education. It is realized that application of the Web 2.0 tools in Indian higher education is still marginal and will have to overcome a lot of obstacles in order to hold its ground as in higher education of developed countries. Therefore we believe that a presentation of the situation of its use in universities would be appropriate, despite the fact, and considering that innovations are always ahead of their social and institutional adoption, that research can already be found about the use and need of the Web 3.0 or Semantic Web in education (Devedzic, 2004).

### Scope of the Study

The present study focuses how the faculty members of participated universities use Web 2.0 tools and technologies in their teaching learning process. The study shows an overall view of innovative uses of Web 2.0 tools and technology in Indian higher education for capturing best innovative teaching practices.



**Figure 1:** Map showing geographical area of the study

The present study is confined to six universities (owned by Central government, State government and Private management) of NCR namely: (i) Amity University, Noida; (ii) Chaudhary Charan Singh University, Meerut; (iii) SRM University's NCR Campus, Ghaziabad; (iv) Sardar

VallabhBhai Patel University of Agriculture and Technology, Meerut; (v) Swami Vivekanand Subharti University, Meerut; and (vi) Shobhit University, Meerut. The map shows the geographical area where the study was conducted.

## PREVIOUS RESEARCH

Ajjan and Hartshorne (2007) conducted a study to assess faculty's awareness of the benefits of Web 2.0 to supplement in-class learning and better understand faculty's decisions to adopt these tools using the decomposed theory of planned behavior (DTPB) model. Findings indicated that while some faculty members feel that some Web 2.0 technologies could improve students' learning, their interaction with faculty and with other peers, their writing abilities, and their satisfaction with the course; few choose to use them in the classroom. Additional results indicated that faculty's attitude and their perceived behavioral control are strong indicators of their intention to use Web 2.0.

Doherty and Cooper (2009) studied on the provision and evaluation of continuing professional development workshops to teach educators how to use Web 2.0 applications and services constructively in their teaching at the University of Auckland. The study describes the design research approach that took to developing the workshops and presents the research results that led to re-design the workshop format to the point where now delivering semi-structured, project-based workshops. The study concludes by discussing whether the project-based approach to teaching the workshops will result in higher levels of implementation by participants and also consider whether introducing the university promotion process into the workshops will increase the incentive for participants to put what they have learned into practice.

Franklin and Harmelen (2007) study into the use of Web 2.0 technologies for content creation for learning and teaching in Higher Education, funded by the JISC, and carried out between March and May 2007. It draws on existing studies, interviews with staff at universities who have implemented Web 2.0 technologies for learning and teaching, and a week-long web based seminar (Webinar) with expert contributions, both from speakers and the audience. The report builds on the briefing documents that were written especially for the Webinar and the results of the Webinar discussions, many of which can be found in the Moodle site that was used to support the conference. Web 2.0 will affect how universities go about the business of education, from learning, teaching and assessment, through contact with school communities, widening participation, interfacing with industry, and maintaining contact with alumni. The possible realms of learning to be opened up by the catalytic effects of Web 2.0 technologies are attractive, allowing greater student independence and autonomy, greater collaboration, and increased pedagogic efficiency. This study has focussed on the content sharing aspects of Web 2.0, including textual, sound, and video data. The study is also cognisant of the fact that content sharing via Web 2.0 mechanisms can be the enabler of social software - software which supports groups in their day-to-day interactions. Because Web 2.0 is a relatively 'young' technology, there are many unresolved problems and issues in its use in universities. These include: Intellectual Property Right for material created and modified by university members and external contributors; appropriate pedagogies for use with Web 2.0 (and equally which pedagogic approaches are enhanced by the use of Web 2.0); how to assess material that may be collectively created and that is often open to ongoing change; the choice of types of systems for institutional use; how to rollout Web 2.0 services across a university; whether it is best to host the services within the university or make use of externally hosted services elsewhere; integration with institutional systems; accessibility; visibility and privacy; data ownership; control over content; longevity of data; data preservation; information literacy; and staff and student training.

Jonatan and Josep (2009) intended to look at a recent innovation or contribute new ideas for future developments in education and the Web, but instead of analyzing the state of adoption of Web 2.0 in higher education (with respect to the institutions, faculty and students) now that some years have passed since its first applications emerged and since Tim O'Reilly gave it its name. The initial hypothesis for the research is that Web 2.0 is still in its infancy in terms of its use in education due to a range of factors, which are principally technical, institutional and social. To meet the aims set; the authors studied the public universities in Catalonia, Spain. The data presented came from the "University and Network Society" project led by the Open University of Catalonia (UOC). This project was based principally on a web survey, though not entirely as it also included information from qualitative interviews with members of the universities' governing bodies to study the policies being introduced to promote the use of ICTs in education. The sample included all those students enrolled for the academic year 2004-2005 and the entire faculty in the Catalan public university directories for the academic year 2005-2006. The internet was, then, both the object of study and the medium for the investigation. The level of response was quite high, which allowed for precise profiling of the group of individuals taking part in the survey. The data included basic population characteristics (such as sex and age) and data that allowed us to select cases so as to match responses to factors that were not connected to these basic population characteristics, such as the university they belonged to. Due to the descriptive and multi-strategic nature of the research, the information analysis techniques involved qualitative analysis of the contents of the interviews and descriptive analysis of the variables, bi-variant analyses and data-association analyses of the data from the survey. The results of this study show that there are no excessive differences between the universities with respect to the actual educational use of the Web, regardless of whether, as an institution, they have invested more in the introduction of the Web in education than others. The common factor in the teaching and learning process is the "traditional" use of the Web, rather than the empowering of users (students) as creators, and not simply consumers, that Web 2.0 enables.

Majhiand Maharana (2011) conducted a study on familiarity of Web 2.0 and its application in learning in two Indian Universities. The study was conducted to assess the familiarity of Web 2.0 tools and their application in learning. The investigators conducted a survey of about 500 respondents, including students, teachers and research scholars of Utkal and Sambalpur Universities in the State of Odisha. A structured questionnaire was designed to elicit information pertaining to the familiarity of the academic community with the Web 2.0 tools and their use for teaching, learning and research. Results revealed that the usage of Web2.0 tools is not very significant in either of the two universities in Odisha. Wiki and social networking sites are most commonly used by the respondents. However, blog, RSS (Really Simple Syndication) social bookmarking and audio/video, etc., with high degree of educational value, are not yet popular among the academic communities. Further, the research found that the academic communities are quite interested to use those tools in their learning process, but they do not have sufficient knowledge and skills to use them. The findings of this study have both theoretical as well as practical implications for academicians, learners and policy makers in the universities.

Yang (2009) studied the use of blogs as a reflective platform in the training processes of English as Foreign Language (EFL) student teachers, who were learning to teach English for future employment in Taiwan. They made use of blogs as a platform to critically reflect on their learning processes as well as to gauge the impact of blogs on their own professional growth. Forty-three student teachers in two teacher-education programs at two science and technology institutions in central Taiwan participated in this study. Two instructors created a blog for use as a discussion forum so that the student teachers could engage in and examine their own reflection process. The data collected was qualitative in nature, consisting of student teachers' posting messages and comments on the blog, surveys on the student teachers' reflective experiences using blogs as reflection tools, and group reflective dialogues recorded by instructors in class meetings over the implementation of blogs during the course. The results showed that the student teachers actively

discussed teaching theories and their implications through blogs. All of the 43 teachers who took part in this study were reflective, and some critically reflected on their thoughts and made significant comments; and the participants considered technology a useful platform for reflecting and communicating with each other. The positive implications for the use of blogs as a medium to provide and promote critical reflection for EFL teachers are discussed.

### **RESEARCH OBJECTIVES**

The main objective of the study is to conduct a usage analysis of Web 2.0 technologies in learning environment by faculty members from different streams and departments (Agriculture, Arts, Education, Engineering, Management and Science) of selected universities at NCR (National Capital Region), India. The other research objectives are as follows:

- (i) To know the purposes of faculty members for using Web 2.0 tools in learning environment;
- (ii) To know the stage of adoption of Web 2.0 tools and technologies;
- (iii) To identify which Web 2.0 tool is used mostly for teaching purpose, and
- (iv) To explore the benefits and contribution of Web 2.0 technologies in education.

### **RESEARCH METHODOLOGY**

To meet the objectives of the study a close-ended structured questionnaire method is used to collect the data. The structured questionnaire is designed keeping in view of the stated objectives comprising of various types of questions, keeping in view of the aspects like total population of faculties in the university, perceived level of computer literacy, selection/recommendation of Web 2.0 tools, promotion of Web 2.0 technology, and future plans to improve usage of Web 2.0 technologies in education. In order to get adequate population size, 6 universities are included in this study. A total of 300 self-administered questionnaires (out of total population 693) were distributed among Professors, Associate Professors, and Assistant Professors of different streams and departments (Agriculture, Arts, Education, Engineering, Management and Science) by adopting stratified random sampling (procedure which first categorizes a population into subgroups and then randomly selects from each subgroup until a desired number is reached). 147 valid samples were collected and analyzed. The response rate is 49%. The distributions of questionnaires are given below: -

- (i) Amity University, Noida;  
(Departments: - Arts, Engineering and Management) = 50
- (ii) Chaudhary Charan Singh University, Meerut;  
(Departments: - Agriculture, Arts, Education, Engineering, Management and Science) = 50
- (iii) SRM University's NCR Campus, Ghaziabad;  
(Departments: - Engineering and Management) = 50
- (iv) Sardar VallabhBhai Patel University of Agriculture and Technology, Meerut;  
(Departments: - Agriculture and Science) = 50
- (v) Swami Vivekanand Subharti University, Meerut;  
(Departments: - Arts, Education, Engineering, Management and Science) = 50
- (vi) Shobhit University, Meerut;  
(Departments: - Engineering and Management) = 50

A pilot study was conducted to streamline the user questionnaire in all of the study universities. The collected data from questionnaires is analyzed with suitable statistical methods (descriptive statistics).

## SURVEY RESULTS

By job roles: 43 (29.25%) were professors, 41 (27.89%) were Associate Professors, and 63 (42.86%) were Assistant Professors (see table 1).

**Table 1: Demographics of Respondents**

| Designation          | Response | Percentage (%) |
|----------------------|----------|----------------|
| Professors           | 43       | 29.25%         |
| Associate Professors | 41       | 27.89%         |
| Assistant Professors | 63       | 42.86%         |
| Total                | 147      | 100%           |

The responses collected from the faculty members to assess the knowledge of Web 2.0 tools and techniques depicted in Table 2. It is encouraged to note that majority of the respondents have good knowledge about blogs, Wikipedia, RSS Feed, Social Networks and Podcasting. In case of SNS and Mashups, the faculty members are less aware, except Assistant Professors (61.90%). It is observed that the Web 2.0 tools are in good stage of adoption by the faculty members (see table 2).

**Table 2: Awareness about Web 2.0 tools**

| Web 2.0 awareness  | Professional Status |                |                      |                |                      |                |
|--------------------|---------------------|----------------|----------------------|----------------|----------------------|----------------|
|                    | Professors          |                | Associate Professors |                | Assistant Professors |                |
|                    | Yes                 | No             | Yes                  | No             | Yes                  | No             |
| Blogs              | 37<br>(86.05%)      | 6<br>(13.95%)  | 33<br>(80.49%)       | 8<br>(19.51%)  | 51<br>(80.95%)       | 12<br>(19.05%) |
| Wikis              | 39<br>(90.70%)      | 4<br>(9.30%)   | 36<br>(87.80%)       | 5<br>(12.20%)  | 56<br>(88.89%)       | 7<br>(11.11%)  |
| RSS Feed           | 34<br>(79.07%)      | 9<br>(20.93%)  | 35<br>(85.37%)       | 6<br>(14.63%)  | 57<br>(90.48%)       | 6<br>(9.52%)   |
| Social Bookmarking | 35<br>(81.40%)      | 8<br>(18.60%)  | 37<br>(90.24%)       | 4<br>(9.76%)   | 58<br>(92.06%)       | 5<br>(7.94%)   |
| Podcasting         | 31<br>(72.09%)      | 12<br>(27.91%) | 27<br>(65.85%)       | 14<br>(34.15%) | 42<br>(66.67%)       | 21<br>(33.33%) |
| SNS, Mashups       | 18<br>(41.86%)      | 25<br>(58.14%) | 13<br>(31.71%)       | 28<br>(68.29%) | 39<br>(61.90%)       | 24<br>(39.00%) |

RSS = Really Simple Syndication, SNS = Social Networking Sites

Web 2.0 tools are still in its infancy in terms of its use in education due to a range of factors, which are principally technical, institutional and social. The respondents in the present study have been asked to indicate which tools they use most. 72.09% Professors use social bookmarking which is followed by wikis (67.44%) and blogs (39.53%). Of the population of Associate Professors, 80.48% use social bookmarking followed by wikis (65.85%) and blogs (46.34%). Among Assistant Professors, 68.25% use a social bookmarking site which is followed by wikis (58.73%) and blogs (50.79%). It is clearly observed that social bookmarking is the most frequent used Web 2.0 tools among the respondents which followed by wikis and blogs. A good percentage of respondents also use RSS Feed. A few percentages of respondents use Podcasting and SNS, Mashup (see table 3).

Web 2.0 technologies relocate “expertise” by broadening the range of information sources available and encouraging collective intelligence through distributed practices of winnowing and sifting rather than single sourcing. Thus, Web 2.0 significantly changes what constitutes literacy, and therefore literacy assessment, in institutions. The potential of Web 2.0 technologies in teaching and learning environments has caught the attention of universities around the world. In present study, the responses of the faculty members indicating the usage of Web 2.0 tools reveal different purposes for their use. The resultant data thus obtained under eight broad purposes are enumerated subsequently. On analysis it has been shown that majority of the faculty members have been using Web 2.0 tools for the three major purposes: for Web based teaching & research (89.11%); for interactive learning features (92.51%); and to keep themselves up to date (93.87%) on related topic of interest. The use of Web 2.0 tools for online submission of papers (35.37%), personalized Web services (12.24%), self publishing on the Web (8.16%), professional communication with others (31.97%), and entertainment (4.76%) presented in table 4. Therefore, it is evident that faculty member's favorable attitude to use Web 2.0 to positively influence their intention to use Web 2.0 (see table 4).

**Table 3:** *Web 2.0 tools application*

| Web 2.0 tools application | Professional Status |                      |                      |
|---------------------------|---------------------|----------------------|----------------------|
|                           | Professors          | Associate Professors | Assistant Professors |
| Blogs                     | 17 (39.53%)         | 19 (46.34%)          | 32 (50.79%)          |
| Wikis                     | 29 (67.44%)         | 27 (65.85%)          | 37 (58.73%)          |
| RSS Feed                  | 13 (30.23%)         | 15 (36.58%)          | 21 (33.33%)          |
| Social Bookmarking        | 31 (72.09%)         | 33 (80.48%)          | 43 (68.25%)          |
| Podcasting                | 8 (18.60%)          | 4 (9.75%)            | 2 (3.17%)            |
| SNS, Mashups              | 2 (4.65%)           | 1 (2.43%)            | 1 (1.58%)            |

**Table 4:** Purpose of using Web 2.0

| Purpose of using Web 2.0                   | Professional Status |                      |                      | Overall         |
|--|---------------------|----------------------|----------------------|-----------------|
|  | Professors          | Associate Professors | Assistant Professors |                 |
| Web based teaching & research              | 39<br>(90.69%)      | 37<br>(90.24%)       | 55<br>(87.30%)       | 131<br>(89.11%) |
| Interactive learning features              | 41<br>(95.35%)      | 35<br>(85.36%)       | 60<br>(95.23%)       | 136<br>(92.51%) |
| To up to date on related topic of interest | 41<br>(95.35%)      | 39<br>(95.12%)       | 58<br>(92.06%)       | 138<br>(93.87%) |
| Online submission of papers                | 15<br>(34.88%)      | 14<br>(34.14%)       | 23<br>(36.50%)       | 52<br>(35.37%)  |
| Personalized Web services                  | 6<br>(13.95%)       | 8<br>(19.51%)        | 4<br>(6.34%)         | 18<br>(12.24%)  |
| Self publishing on the Web                 | 2<br>(4.65%)        | 2<br>(4.87%)         | 8<br>(12.69%)        | 12<br>(8.16%)   |
| Professional communication with others     | 11<br>(25.58%)      | 14<br>(34.14%)       | 22<br>(34.92%)       | 47<br>(31.97%)  |
| Entertainment                              | 2<br>(4.65%)        | 3<br>(7.31%)         | 2<br>(3.17%)         | 7<br>(4.76%)    |

**Table 5:** Knowledge Distribution Pattern

| Knowledge Distribution Pattern           | Professional Status |                      |                      | Overall        |
|--|---------------------|----------------------|----------------------|----------------|
|  | Professors          | Associate Professors | Assistant Professors |                |
| Slides Show Presentation using Projector | 11<br>(25.58%)      | 14<br>(34.14%)       | 22<br>(34.92%)       | 47<br>(31.97%) |
| Text Blog                                | 6<br>(13.95%)       | 8<br>(19.51%)        | 4<br>(6.34%)         | 18<br>(12.24%) |
| Podcasts                                 | 1<br>(2.32%)        | 1<br>(2.43%)         | 1<br>(1.58%)         | 3<br>(2.04%)   |
| Teaching Videos                          | 1<br>(2.32%)        | 1<br>(2.43%)         | 1<br>(1.58%)         | 3<br>(2.04%)   |
| Wikis Page                               | 2<br>(4.65%)        | 2<br>(4.87%)         | 8<br>(12.69%)        | 12<br>(8.16%)  |



|                       |              |              |              |              |
|-----------------------|--------------|--------------|--------------|--------------|
| Educational Web sites | 3<br>(6.97%) | 2<br>(4.87%) | 2<br>(3.17%) | 7<br>(4.76%) |
|-----------------------|--------------|--------------|--------------|--------------|

The respondents had collected the responses to ascertain the knowledge distribution pattern in Indian Universities under six patterns. Table 5 depicts the results obtained from the question. 31.97% of the respondents selected that they use a slide show presentation application, while 12.24% respondents make use of the text blog which is followed by wiki pages (8.16%) (see table 5).

**Table 6: Usage of Blogs in Education**

| Blogs                  | Professional Status |                      |                      | Overall        |
|------------------------|---------------------|----------------------|----------------------|----------------|
|                        | Professors          | Associate Professors | Assistant Professors |                |
| Educationforallinindia | 3<br>(6.97%)        | 2<br>(4.87%)         | 2<br>(3.17%)         | 7<br>(4.76%)   |
| Indiacompetition       | 2<br>(4.65%)        | 1<br>(2.43%)         | 1<br>(1.58%)         | 4<br>(2.72%)   |
| Infinitecourses        | 0.0%                | 0.0%                 | 0.0%                 | 0.0%           |
| Inflibnet              | 11<br>(25.58%)      | 8<br>(19.51%)        | 9<br>(14.28%)        | 28<br>(19.04%) |
| PlanetChemistry's      | 3<br>(6.97%)        | 1<br>(2.43%)         | 2<br>(3.17%)         | 6<br>(4.08%)   |
| Studyfreak             | 7<br>(16.27%)       | 3<br>(7.31%)         | 6<br>(9.52%)         | 16<br>(10.88%) |

**Table 7: Usage of Wikis in Education**

| Wikis         | Professional Status |                       |                      | Overall        |
|---------------|---------------------|-----------------------|----------------------|----------------|
|               | Professors          | Associated Professors | Assistant Professors |                |
| en.wikipedia  | 11<br>(25.58%)      | 14<br>(34.14%)        | 22<br>(34.92%)       | 47<br>(31.97%) |
| en.wiktionary | 1<br>(2.32%)        | 1<br>(2.43%)          | 1<br>(1.58%)         | 3<br>(2.04%)   |
| fr.wiktionary | 0.0%                | 0.0%                  | 0.0%                 | 0.0%           |

|               |              |              |              |              |
|---------------|--------------|--------------|--------------|--------------|
| answers.wikia | 1<br>(2.32%) | 1<br>(2.43%) | 1<br>(1.58%) | 3<br>(2.04%) |
| reviews.wikia | 0.0%         | 0.0%         | 0.0%         | 0.0%         |

The use of blogs is a way to provide such motivation for reading in a language other than one's mothertongue, through the interactive nature of the blog. One can read and also comment on what one reads in expectation of a little discussion and a quest for common interests and individual differences. Educational applications of blogs include researching, tracking, interpreting, and evaluating blogs for political commentary (multiple perspectives). The respondents in the present study have been asked to indicate which blogs they use mostly. Table 6 shows that 19.04% of the respondents use infibnet blog followed by studyfreak (10.88%) and educationforallinindia (4.76%) for their education purpose. Yet, there are still majorities who do not use blog in education (see table 6).

**Table 8:** Usage of Sharing Sites for Collaboration/Corporation

| Sharing sites<br>(video, photo,<br>book, movie,<br>music, etc.) | Professional Status |                          |                         | Overall         |
|---|---------------------|--------------------------|-------------------------|-----------------|
|   | Professors          | Associated<br>Professors | Assistant<br>Professors |                 |
| Twitter   | 21<br>(48.84%)      | 23<br>(56.09%)           | 42<br>(66.67%)          | 86<br>(58.50%)  |
| LinkedIn  | 15<br>(34.88%)      | 13<br>(31.71%)           | 17<br>(26.98%)          | 45<br>(30.61%)  |
| facebook  | 33<br>(76.74%)      | 29<br>(70.73%)           | 49<br>(77.78%)          | 111<br>(75.51%) |
| ApnaCircle  | 6<br>(13.95%)       | 8<br>(19.51%)            | 12<br>(19.05%)          | 26<br>(17.68%)  |
| flickr  | 8<br>(18.60%)       | 9<br>(21.95%)            | 6<br>(9.52%)            | 23<br>(15.64%)  |
| Orkut   | 11<br>(25.58%)      | 7<br>(17.07%)            | 9<br>(14.29%)           | 27<br>(18.36%)  |

Wikis are useful in educational settings in that they support individualized learning, allowing for more socially defined search structures and promote collaboration through group editing and peer review. It is observed from the table 7 that small but significant percentages (31.97%) of the respondents use Wikipedia in their learning environment which is followed in equal percentages by en.wiktionary (2.04%) and answers.wikia (2.04%) (See table 7).

While the increase in the use of sharing sites has generated concerns among parents, school officials, and government officials about the potential risks posting personal information on these sites, it is evident they have a series of positive pedagogical implications. Currently, users utilize these sites to stay in touch with their friends, to make plans, make new friends, or flirt with

somebody online. Extending this idea, these sites could be used to establish series of academic connections or to foster cooperation and collaboration in the higher education classroom. The respondents were asked to indicate the sharing sites they used in collaborative/corporation work. The results depicted in table 8. The analysis shows that facebook (75.51%) is widely used by the faculty members, which is followed by twitter (58.50%) and linkedin (30.61%). It is observed from the analysis that majority of faculty members are engaged in collaborative/corporation work (see table 8).

Another question sought to ascertain the benefits of Web 2.0 in learning environment under 8 statements. The analysis shows that majority of the respondents stated that Web 2.0; support innovative teaching methods, peer-to-peer learning, creation of personal learning environment, enhance student motivation, learner centered instruction tools, learning participation, information/knowledge sharing, and corporative/collaborative work (see table 9).

**Table 9: Benefits of Web 2.0 in learning environment**

| Benefits of Web 2.0<br>(Statements)       | Professional Status |               |                      |               |                      |              |
|---|---------------------|---------------|----------------------|---------------|----------------------|--------------|
|   | Professors          |               | Associate Professors |               | Assistant Professors |              |
|   | Agree               | Disagree      | Agree                | Disagree      | Agree                | Disagree     |
| Support innovative teaching methods       | 43<br>(100%)        | 0%            | 40<br>(97.56%)       | 1<br>(2.44%)  | 63<br>(100%)         | 0%           |
| Peer-to-Peer learning                     | 43<br>(100%)        | 0%            | 41<br>(100%)         | 0%            | 61<br>(96.83%)       | 2<br>(3.17%) |
| Creation of Personal learning environment | 40<br>(93.02%)      | 3<br>(6.98%)  | 41<br>(100%)         | 0%            | 60<br>(95.24%)       | 3<br>(4.76%) |
| Enhance student motivation                | 43<br>(100%)        | 0%            | 41<br>(100%)         | 0%            | 60<br>(95.24%)       | 3<br>(4.76%) |
| Learner centered instruction tools        | 37<br>(86.05%)      | 6<br>(13.95%) | 36<br>(87.80%)       | 5<br>(12.20%) | 57<br>(90.48%)       | 6<br>(9.52%) |
| Learning participation                    | 39<br>(90.70%)      | 4<br>(9.30%)  | 41<br>(100%)         | 0%            | 60<br>(95.24%)       | 3<br>(4.76%) |
| Information/Knowledge Sharing             | 43<br>(100%)        | 0%            | 41<br>(100%)         | 0%            | 61<br>(96.83%)       | 2<br>(3.17%) |
| Corporative/Collaborative Work            | 43<br>(100%)        | 0%            | 41<br>(100%)         | 0%            | 63<br>(100%)         | 0%           |

Web 2.0 applications foster a new approach to learning. The possibility to share educational materials and to imagine derivative projects gives a wide range of opportunities for teachers to reach specific learning needs and focus on outcomes for a more empowering learning experience. The investigator tried to find out the experiences and views of faculty members for all

universities on learning applications of Web 2.0. The resultant data obtained under the five statements. The analysis shows that majority of the respondents agreed that Web 2.0 broadened faculty' perspective, and facilitated obtaining students' feedback and following students' interest trends (i.e. creates opportunity for collaborative work, and sharing knowledge with each other and developing new knowledge), drew on collective knowledge to better serve, improved teachers' inter-departmental communication, facilitated instant problem solving with the benefit, improved knowledge sharing and collaboration (see table 10).

The potential of Web 2.0 technologies in teaching and learning environments has caught the attention of universities around the world. Web 2.0 trends in distance education, globalization, digital literacy skills, and collective intelligence are now driving the restructuring of academic programs. In order to test the level of adoption of Web 2.0 tools for teaching and learning in India context, the investigator put forward 4 statements. Majority of respondents (82.99%) stated that Web 2.0 tools in Indian higher education is still marginal and will have to overcome a lot of obstacles in order to hold its ground as in higher education of developed countries (as depicted in table 11).

**Table 10: Web 2.0 Contributions in Education**

| Web 2.0 Contribution   | Professional Status |               |                       |               |                      |              |
|--|---------------------|---------------|-----------------------|---------------|----------------------|--------------|
|  | Professors          |               | Associated Professors |               | Assistant Professors |              |
|  | Agree               | Disagree      | Agree                 | Disagree      | Agree                | Disagree     |
| Broadened faculty' perspective, and facilitated obtaining students' feedback and following students' interest trends | 40<br>(93.02%)      | 3<br>(6.98%)  | 40<br>(97.56%)        | 1<br>(2.44%)  | 60<br>(95.24%)       | 3<br>(4.76%) |
| Drew on collective knowledge to better serve   | 39<br>(90.70%)      | 4<br>(9.30%)  | 40<br>(97.56%)        | 1<br>(2.44%)  | 60<br>(95.24%)       | 3<br>(4.76%) |
| Improved teachers' inter-departmental communication  | 43<br>(100%)        | 0%            | 41<br>(100%)          | 0%            | 61<br>(96.83%)       | 2<br>(3.17%) |
| Facilitated instant problem solving with the benefit   | 37<br>(86.05%)      | 6<br>(13.95%) | 36<br>(87.80%)        | 5<br>(12.20%) | 57<br>(90.48%)       | 6<br>(9.52%) |
| Improved knowledge sharing and collaboration   | 43<br>(100%)        | 0%            | 40<br>(97.56%)        | 1<br>(2.44%)  | 61<br>(96.83%)       | 2<br>(3.17%) |

**Table 11:** Adoption Level of Web 2.0 applications

| Adoption Level                | Professional Status |                      |                      | Overall         |
|-------------------------------|---------------------|----------------------|----------------------|-----------------|
|                               | Professors          | Associate Professors | Assistant Professors |                 |
| At early stage of adoption    | 3<br>(6.98%)        | 1<br>(2.44%)         | 5<br>(7.94%)         | 9<br>(6.12%)    |
| Is still marginal             | 35<br>(81.39%)      | 36<br>(87.80%)       | 51<br>(80.95%)       | 122<br>(82.99%) |
| At advanced stage of adoption | 0%                  | 1<br>(2.44%)         | 0%                   | 1<br>(0.68%)    |
| No Comments                   | 5<br>(11.63%)       | 3<br>(7.32%)         | 7<br>(11.11%)        | 15<br>(10.20%)  |

## CONCLUSION

Any educational practice that concerns the playful, expressive, reflective or exploratory aspects of knowledge building is likely to find Web 2.0 tools and services a powerful resource. Moreover, educators can safely assume that most learners know about them. When directed at learning, Web 2.0 impacts on four principal dimensions of the learner's experience. Two are broadly social in nature (collaboration and publication) and two are more cognitive (literacy and inquiry). Web 2.0 tools appear to strengthen fundamental aspects of learning that may be difficult to stimulate in learners. There are problems with Web 2.0 learning in practice, but these tools do seem to mark a step change in the ways in which learners can interact with and on the web.

The rise of internet technologies that can be grouped under the Web 2.0 heading has generated a good deal of interest in education. This is because the popularity of sites such as flickr, facebook, MySpace, wikipedia, etc is interesting in itself, in terms of what drives users to these sites and why they keep returning. But more significantly it is their potential as tools to facilitate learning that has caused much discussion.

The use of Web 2.0 tools provides the ability to incorporate personalized, scalable and customizable systems. A teacher equipped for a knowledge economy needs to be equipped to deal with ambiguity, needs to be adaptable, highly mobile, entrepreneurial and creative. The workforce requires people with these qualities, and therefore the educational institutions need to model environments using the same principles. The Web 2.0 technologies described in this study are widely used in the workplace and by faculty members. Therefore, an important and relevant instructional goal for educators preparing students for their professions is to help students learn to use these technologies for lifelong learning, teamwork, collaboration, document and idea sharing, inquiry, and so on.

The results also indicate that the faculty attitude and their perceived behavioral control are strong predictors to their intention to use Web 2.0. This suggests that administrators interested in increasing the use of Web 2.0 in the classroom might focus their attention, efforts, and investments on improving faculty attitude and enhance their perceived behavioral control of Web 2.0 use. More specifically, these efforts should focus on improving the perceived usefulness,

ease of use, and compatibility (with current practices) of Web 2.0 applications, as well as improving faculty's self efficacy with these emerging technological tools. Additionally, while these tools show pedagogical promise, "best practices" models are needed to further facilitate the adoption of these emerging technologies as tools for improving teaching and learning in higher education.

## FURTHER RESEARCH

The study can be extended over to the other universities, colleges and institutions. Detailed analysis can be taken to see the impact of Web 2.0 technologies in education. Further studies could identify which barriers occur at which stages in the Web 2.0 technologies using process and how can these obstacles be overcome. There is a vast scope for further research to study different types of faculty' behavior and comparison of faculty' behavior and attitudes towards the Web 2.0 technologies. Finally investigator believes that studies are needed on ways to improve and encourage faculties to use Web 2.0 technologies in education.

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