

# Intelligent Campus Environment: A Requisite to be Competent

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## Abstract

Learning and teaching methods have changed to an innovative mode due to the support of technology. Technology can connect experts and aspirants of different educational institutes. Among many uses managing the documents with less use of papers can create an eco-friendly environment is one of the use in the organization. Though these are all the useful aspects of technology, this study tries to find out whether application of technology is accepted by students and faculty members for the benefit of the students. The independent variables considered in this study include data management, account management, security, time management, attendance management, and social media. Performance and quality improvement are dependent variables. A sample is collected from students and faculty members from four established post graduate colleges in Bangalore. Questionnaire is administered and 142 samples were received. The data was analyzed. It was found that performance of the students cannot be improved by monitoring the attendance by the usage of technology. But it was clear from the study that performance increased due to social media and by managing time using technology. From the study it was understood that security was not part of quality improvement but management of all types of data focus towards the improvement of quality in educational institutions.

**Keywords:** Creativity, Education, Innovation, Intelligent, Learning, Technology, Teaching

## 1. Introduction

There is always a relationship between student's educational experience and the campus in which one studies. Tremendous changes are happening in the educational campuses related to technology. Students who are born in this technological era use this with ease and have become inevitable<sup>12</sup>. The new innovations related to technology are not only influencing the teaching-learning process but it improves the effectiveness of the institute in totality. The shift from conventional to technology-based campus has transformed the educational institutions. Technology helps in collecting and assessing more information with ease. But the class room learning remains

the foundation of the teaching-learning system. On-line teaching and learning is one of the advancement in higher education. Another advantage is to access any information from any part of the world. There is some impact of the new technologies towards higher education. Major usefulness is related to on-line provision that can be assessed free of cost and from the place of convenience. Customization is possible and can be tailored to the needs of the student. Provision of quicker feedback related to the performance of the individual is another advantage one obtains from technology. The flexibility to access information from anywhere, anytime and for everybody is a motivation to learn lifelong. The outlook of higher education has changed completely due to

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the advancement in technology. The teaching and learning concept can reach to the remote areas where students had to travel kilometers together to reach the nearest University. Technological development can open the doors to many who are deprived to knowledge. Thus a change is witnessed in the way student learn because of technology. In the virtual classroom, video conferencing software (such as Adobe Connect, Blackboard Collaborate, or Cisco WebEx) is used as the means through which instructors and students can participate in live class discussions. The staple features of these programs are: 1. They allow for instructors and students to broadcast themselves, individually, via a webcam wherein they can see themselves and the other participants; 2. They connect the audio of participants through either an integrated phone bridge or through the use of Voice Over Internet Protocol (VOIP); and 3. They provide a chat box or texting tool where participants can read and type text during a discussion<sup>5</sup>.

Another advantage of technology is for the teachers to interact with their fellow members and update them with the latest information. How teachers can leverage electronic mailing lists (listservs) to share opinions, suggestions and practices<sup>9</sup>. Similarly, teachers used Twitter to develop new professional ties, leveraging those ties to increase their access to information and passing on that new information to others<sup>6</sup>. This kind of tie-up will help the teachers to get connected with other teachers and experts in the same area of expertise. Through technology, connectivity can be improved that is very important for education<sup>10</sup>. While compared to traditional method of teaching the connectivity of teacher and student has improved through technology. This expands their horizon of knowledge and can access more knowledge resources. Online professional communities will increase the potential for dialogue among educators, thereby improving schooling<sup>2</sup>.

## 2. Characteristics of Digital Education

Three important attributes of digital education are interactivity, symbolic flexibility, and vast

sources of information. Interactivity of myriad kinds defines the digital world<sup>4</sup>. Direct interaction in the digital world can augment face-to-face interaction. Asking questions and receiving feedback is immediate and fast, for creating seamlessly merged narratives, reports, emails, blogs postings, or social media connections. When tools are not uniformly available, hybrid forms of interactivity can work, as long as there is interactive purpose. A major usefulness of digitalization is the storage and searching capability. Data can be collected, stored and used for future purpose. More information always helps to take an effective decision. So if the data is arranged and stored in a methodical manner then retrieving is possible without any support. Now searching of information is at the finger tip. Students are opened to the wide world of knowledge at any time at any place. So to complete an assignment or a project is not a difficult task compared to olden times. Students can access the information of his interest and can master it without any external support. The mobile technological devices like smart phones, laptops etc help students to access the information from everywhere<sup>1</sup>.

Videoconferencing is another use of technology with which students can listen to the talk of proficient lecturers and improve the knowledge related to the specific area of interest. Some universities and community colleges are turning to a high-definition, lifelike form of videoconferencing known as tele-presence, which provides an experience so realistic that participants feel as if they're all in the same room<sup>13</sup>. The advancement in mobile technologies has eliminated the limits of space and time and the learning process has taken a new dimension<sup>11</sup>. It can be concluded that the presence of technology help in connectivity, an opportunity to access various resources and also self-learning<sup>15</sup>.

## 3. Technology Driven Teaching-Learning

Introducing technology for the teaching- learning process is not that rosy as it is expected. Online teaching requires more preparation and

thorough understanding of the technology. The teacher should exhibit confidence in usage of technology to the students and this causes the increase of technology by the student<sup>3</sup>. This confidence that is displayed by the teacher helps the interaction of teacher and student in a smooth manner using technology<sup>8</sup>. Another method of teaching is flipped classroom, where learning is possible by watching on-line videos and then attending the class room lecture<sup>14</sup>. This method is effective and is possible because of technological intervention.

Systematic planning is crucial for its success, unlike conventional method of teaching. Technology based teaching result in less contact with the student to impart morals and for the overall development of the student. Continuous monitoring and evaluation, based on aspects other than academics, will not happen on regular basis. One to one interaction virtually cannot be matched with real, direct interaction. Teacher communities are characterized by teachers' active participation and collaboration in problem solving and decision making, a strong focus on teaching and learning, and an emphasis on developing evidence based practice<sup>7</sup>. Students spend more time in the digital world in the pretext of learning, while enjoying with other non-academic aspects. This has to be monitored continuously so that studying time is not wasted. The speed in which connectivity is possible is also an issue related to technology. So the time taken to complete a session depends on the speed in which online works. Getting familiar with the tools may take time for some individuals for the online teaching to be successful. Power failure and poor back-up energy may result in poor performance and interruption related to the job. If the collected data is not stored in a systematic and sequential manner may result in chaos. This may result in confusion and extra burden. In such situation more information may be a curse than a boon. So if data is arrangement in a proper manner then it is easy to access it and retrieval is also effortless. Entry of data into the computer system is time consuming and personnel with less experience take more time to complete the work.

## 4. Digitalization and Educational Institutions

It is not only the instructional process, lot of changes have happened in the academic administration also. Traditionally, every activity was done manually and took long time to complete and errors also creep in. But dramatic changes occurred after the advent of technology. It changed the face of the educational institution into an advanced, cost-effective and speedy institution that can reap its full potential. Some of the changes that is visible in the areas like students' data, attendance, fee and time management is managed using various applications of technology.

### 4.1 Security

Security is another area where technology has been developed to manage crisis. Many of the educational institutions have installed security system that integrate video surveillance with students and faculties identity cards to record their entry and exit from a building. This recording will discourage strangers from accessing the building. Video surveillance can dampen the idea of illegal or immoral activities within the campus. Video cameras provide the staff to view record and retrieve if any unlawful event happens in the organization.

GPS-based vehicle tracking system can track the movement of the vehicle related to the educational institution that carries students and faculties to and from the institution. This system improves the communication of the educational institute, parents and the driver related to the safety of those who travel by the vehicle. It is possible to track the location of their vehicles and buses using driver-operated radios, a manual solution that depends on proactive driver communication and open access public radio channels with spotty coverage<sup>13</sup>.

### 4.2 Data Management

Another area of interest related to technology is the paperless campus. Lot of data have to be managed and requires time, money and energy. It can be reduced considerably technologically. All paper

related activities include application form to report card preparation to assignment submission, entry of accounts details in books are possible using technology. Less use of paper means less tree cut and saving the environment. In an educational institute use of paper is humongous and it can be reduced to half or less than that by use of technology wisely. Space for storage of papers or books or records can be reduced and the data can be stored in pen-drives or compact disc or DVDs. The entry of fees details of students in the computer system is helping the administrator to retrieve the data whenever required. Education institutions can benefit from technology systems and tools that will help them automate and simplify these processes while reducing (or eliminating) paper<sup>13</sup>.

### 4.3 Influence of Social Media

Social media help students to share and to keep in touch with the latest information related to their study. It acts as a platform to initiate conversation, collect feedback and help to clear queries. Social media arrange a stage for the students to network and interact with experts in different areas of their interest. This media help faculty members to interact and communicate with the parents of their wards to update on their performance and attendance in the class.

Educational institutions use biometric systems in libraries and to mark the presence of students and faculty members in the campus. These systems are highly accurate and the data can be recorded and stored effectively.

From the understanding of use of various technologies for the functioning of educational

institution, it is important to find out how effective these technologies are for their day to day functioning. Having technology is not vital, the actual use and benefit for the users is crucial. So this study is trying to focus on it with the following objectives.

## 5. Objectives of Study

- To understand the progress of technology in the area of education.
- To find out the relation between performance (dependent variable) and attendance management, support from social media and time management.
- To find out the relation between quality improvement (dependent variable) and data management, security and accounts management.

## 6. Hypothesis

H1: There is a significant relation between the performance of the students and attendance management, support from social media and time management using technology.

H2: There is a relation between quality improvement and data management, security and accounts management.

## 7. Methodology

The study tries to find out whether there is improvement of performance of the students because of attendance management using technology,

**Table 1.** Correlation between performance and independent variables

|                       | Performance | Attendance Management | Social Media | Time Management |
|-----------------------|-------------|-----------------------|--------------|-----------------|
| Performance           | 1           |                       |              |                 |
| Attendance management | 0.115       | 1                     |              |                 |
|                       | 0.175       |                       |              |                 |
| Social media          | 0.230**     | 0.565**               | 1            |                 |
|                       | 0.006       | 0                     |              |                 |
| Time management       | 0.454**     | 0.248**               | 0.388**      | 1               |
|                       | 0.000       | 0.003                 | 0.000        |                 |

support from social media and time management using biometrics. Also tries to find out whether there is improvement in quality because of data management, security of the staff and students because of technology and also accounts management due to technology.

The data was collected from 15 faculty members and 127 students from educational institutions who have implemented technology in their institute. Out of which 86 are males and 56 are females. Four educational institutes were selected for the study. Students and faculties were from these four institutes. Questionnaires were distributed to each college and collected after two days. Total of 300 questionnaires were distributed among four post graduate educational institutes but only 142 numbers were received back. All students who participated for filling questionnaires were all post graduate students. Both first year and second year students had participated in the process. Faculty members who are teaching them also filled the questionnaires.

Reliability test is done to find the reliability using Cronbach's  $\alpha$ . The value was .825. The value was found to be good, as value was  $>0.7$ , the reliability was confirmed.

Correlation test is to find the relation between the variables. The correlation coefficient explains the strength of the relationship and the p value explains the relationship between the two variables. While regression helps to find the functional relationship between dependent and independent variables.

## 8. Analysis

H1: There is a significant relation between the performance of the students and the attendance management, support from social media and time management using technology.

Correlation test was conducted first and then regression test was done to confirm the results obtained.

From the table it is found that there is no relationship between performance and attendance management ( $p>0.05$ ). There is a significant relation between social media and performance

( $p<0.05$ ) and a significant relation between time management and performance ( $p<0.05$ ).

The correlation between quality improvement and different independent variables like data management, security and accounts management is done. Correlation explains the degree of relationship between two variables. There is no relationship between performance and attendance management as the value is more than .05 but there is a positive relationship between social media and performance. There is a positive relationship between performance and time management.

**Table 2.** Model summary – performance and independent variables

| R value | R square | F value | Sig.  |
|---------|----------|---------|-------|
| 0.659   | 0.411    | 12.281  | 0.000 |

Dependent Variable: performance

Independent Variables: social media, time management and attendance management

From the Table it is clear that 41% of performance is justified by social media, time management and attendance management. The p value is less than 0.05 so the model is significant.

Regression test confirms that the p values of time management and social media are less than 0.05 while that of attendance management is not significant as p value is  $> 0.05$ . So for every unit change in time management and social media there is a change in performance. But the attendance management has negative regression coefficient with a value,  $-.038$  which means that every unit increase of attendance management results in decrease in performance by .038 units. The standard error is more for attendance management, .084; this indicates that significance is less. The standardized beta ( $\beta$ ) of time management is close to 1, this indicates that the relationship is strongest for time management and performance.

From the analysis it is proved that there is a relationship between performance and time management, performance and social media as the value is significant so the null hypothesis is rejected and alternate hypothesis is accepted. But the value for the relationship between attendance management and performance is not significant

**Table 3.** Coefficients – performance and independent variables

| Independent Variables | B      | Std. Error | $\beta$ | T      | Sig.  |
|-----------------------|--------|------------|---------|--------|-------|
| Constant              | 2.025  | 0.301      |         | 6.722  | 0.000 |
| Time management       | 0.423  | 0.081      | 0.430   | 5.244  | 0.000 |
| Attendance management | -0.038 | 0.084      | -0.041  | -0.450 | 0.063 |
| Social media          | 0.054  | 0.082      | 0.037   | 0.302  | 0.039 |

Dependant Variable: Performance

**Table 4.** Correlation between quality improvement and independent variables

|                     | Quality improvement | Data management | Security | Accounts management |
|---------------------|---------------------|-----------------|----------|---------------------|
| Quality improvement | 1                   |                 |          |                     |
| Data management     | 0.479**             | 1               |          |                     |
|                     | 0.000               |                 |          |                     |
| Security            | 0.142               | 0.100           | 1        |                     |
|                     | 0.091               | 0.235           |          |                     |
| Accounts management | 0.256**             | 0.266**         | 0.255**  | 1                   |
|                     | 0.002               | 0.001           | 0.002    |                     |

so null hypothesis, that is, there is no relationship between the variables is accepted.

H2: There is a relation between quality improvement in the educational institute and data management, security and accounts management.

The correlation test was conducted with quality as dependent variable and data management, security and accounts management as independent variable. The details are given in the table.

In the table, the correlation between quality improvement and data management is significant. Also there is relation between quality improvement and accounts management. But there is no relation between quality improvement and security aspect. Further regression test is carried out to find the cause and affect relationship of the variables which is left incomplete by correlation.

**Table 5.** Model Summary – Quality Improvement and Independent Variables

| R     | R Square | F      | Sig.  |
|-------|----------|--------|-------|
| 0.612 | 0.363    | 16.381 | 0.000 |

Dependent Variable: quality improvement

Independent Variables: data management, accounts management, security

From the table it is clear that 36% of quality improvement is justified by data management, accounts management and security. The p value is less than 0.05 so the model is significant.

**Table 6.** Coefficients – quality improvement and independent variables

| Independent Variables | B     | Std. Error | $\beta$ | T     | Sig.  |
|-----------------------|-------|------------|---------|-------|-------|
| Constant              | 1.736 | 0.309      |         | 5.612 | 0.000 |
| Accounts management   | 0.127 | 0.050      | 0.158   | 2.115 | 0.036 |
| Security              | 0.049 | 0.069      | 0.063   | 0.836 | 0.405 |
| Data management       | 0.434 | 0.038      | 0.468   | 6.367 | 0.000 |

Dependant Variable: Quality Improvement

Regression test confirms that the p values of accounts management and data management are less than 0.05 while that of security is not significant as p value is > 0.05. So for every unit change

in accounts management and data management there is a change in quality improvement. But the security has no relevance to the improvement of quality as the p value is greater than 0.05. The standard error is more for security, .069; this indicates that significance is less. The standardized beta ( $\beta$ ) of data management is close to 1, this specifies that the relationship is strongest for data management and quality improvement.

From the analysis it is proved that there is a relationship between quality improvement and accounts management, quality improvement and data management as the values are significant so the null hypothesis is rejected and alternate hypothesis is accepted. But the value for the relationship between security and quality improvement is not significant so null hypothesis is accepted as there is no relationship between the variables

## 9. Findings

The study is conducted among youngsters who are studying in four different institutions that are technologically updated. Data was collected from their faculty members also. About one hundred and forty two filled questionnaires were received and analyzed. It is found that among the number of respondents, including both faculty and students, 86 respondents were males and 56 were females. Some of the independent variables considered in the study were social media, time management, attendance management, data management, security and accounts management. The dependent variables considered in the study are performance and quality improvement. The relationship of the first three variables, social media, time management and attendance management were tested with performance. Then other three variables were tested with quality. It was found that there is no relation between attendance management and performance and also it was found that there is no relationship between security and quality improvement. It is stated from the data collected from students and faculty members that the performance is not based on managing performance in a systematic manner using technology. But use of social media and usage of technology for time

management has improved the performance of the students. The study on security measures adopted in educational institutions using technology has no impact on the improvement of quality but managing data and accounts in a systematic manner has an impact on the quality improvement of the institute.

## 10. Discussion

This paper tries to focus on digitalization of educational institute. The study attempts to find the positive and negative aspect of digitalization. The usage and benefits of technology in educational institutions are explained initially. Through technology, the possibility to improve quality and performance is analyzed through this paper. As most sectors are technology driven there is a pressure for the educational institutes to get digitalized. There is different opinion given by the respondents who participated in the study. There is no doubt that technology always has an upper hand while compared to the conventional method. But in this study the opinion about the students and faculty related to quality improvement and performance using some independent variables are tested to find out the influence of technology in these areas. It is clear that blindly accepting the technology will not add value is proved in this study. In this paper, the variables considered are data management, account management, security, time management, attendance management, and social media. For improving the performance of the students the variables considered are time management, attendance management and social media. Study reveals that time management using technology has improved the performance of the students. Even usage of social media has improved the performance of the students. Interaction with students of other colleges and Universities are possible with the help of social media. This networking has resulted in increase in reading, which is referred by other institution teachers, was one of the opinions of respondents. According to many students, who participated in the survey opined that social media is an inexpensive and easily interactive electronic tool that help to retrieve

information that are of common interest. So this tool is helping them a lot and has changed the outlook towards the learning and reading habits. Developing relationship with faculty members of other colleges through social media has helped teaching fraternity to know about development programs organized in other colleges, job vacancy and teaching related information. Strict attendance will not improve the performance is the view of most of the respondents. Being in the class will not improve performance is the belief of most students. Attendance taken using technology is precise and students who were absent from the class due to genuine reasons cannot be identified if attendance system is totally mechanized. Being in the class is not the ultimate of performance improvement is being opined by some of the students and faculties. It is the interest that pushes the students to fair well in the examination. Through pressure, students can be pushed to certain extend but their passion to learn and understand can take them a long way. So the study clearly states that a strict and meticulous attendance calculation through technology and serious action to absentees will not improve the performance is the indication through this study.

In order to understand the quality aspect, some of the variables considered are accounts and data management and security. Study reveals that security is not part of the quality but it is a necessity. Upgrading the security concern with updated technology is always good for the organization. The security of the students while travelling in college vehicles using GPS or using closed circuit television within the campus can reduce the insecurity feeling among the students and staff. According to participants of the survey technology up-gradation related security is not part of the quality improvement but part of infrastructure. But data management and accounts management is part of quality improvement. Lot of data is managed within the college like the background of students, marks etc. If a proper system is maintained using technology, then storage and retrieving of data is easy and methodical. Maintaining the huge data of an established educational institution require updated technology. The data storage in the repos-

itories and recovering whenever required should be hassle free. This is part of quality enhancement. Another area of concern is accounts. The data related to it has to be entered and stored in a logical way to avoid chaos. This is possible using technology. Reminders regarding the fee payment, the amount and last date can be intimated to students without difficulty using technology. Tax and other legalities can be calculated and be made transparent using technology. An educational institution with sophisticated technology will help to manage account related information in an accurate and perfect manner.

## 11. Conclusion

The study focuses on performance and quality improvement using technology to make campuses intelligent. From the literature some variables are identified that make the campus bright. The technology, no doubt has removed the barriers of traditional campus. The acceptance of technology is made clear through this study. Extensive use of technology may miss emotional touch is the opinion of majority of respondents. Without personal contact genuine reasons may not be possible to consider and remain unnoticed. But the availability of information technology helps to update and understand any topic under the sky. Technology can solve problems easily and take right decisions with accurate data. Students find studying easy with technology. They find, use of technology as an easy means to clear doubts. Major difficulty regarding technology is about upgrading the campuses with technology and getting accustomed to it is another barrier. Present environment is so volatile and change oriented. Changing anything from what is practiced previously is a stumbling block. Once status-quo is possible to overcome, then implementation is an easy task.

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