

A Recipe for the use of ICT tools in an Educational Institute

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Abstract: Information and Communication Technology (ICT) has become an indispensable tool for teaching learning and for effective management and administration of an educational institute. Use of ICT tools in an educational institute reduces manual work and enhances timeliness, effectiveness and efficiency. This is also environment friendly by saving paper. This paper describes simple use of ICT tools at various levels in an educational institute. The methods explained are very simple incurring no extra cost other than availability of internet and provides guidance to make an immediate beginning to use them. The use cases of each method are described thus enabling the reader to know how and where they can be adopted. The experience of using these in our institute has been well appreciated and accepted by administrators and other faculty members.

Keywords: Information and communication Technology (ICT), teaching learning, administration

1. Introduction

ICT is influencing all aspects of life and is felt significantly at educational institutes. It provides all stakeholders – students, teachers, management and parents with more opportunities in adapting learning, teaching and managing the individual needs [1]. It provides newer and more effective ways of mitigating some of the challenges being faced by the educational system. In the present information age, educational institutions are expected to play a crucial role as the engine for knowledge generation and learning environment. ICT plays a vital role in improving the functional effectiveness of an educational system.

In education, use of ICT has changed the landscape of educational practice. Every aspect of classroom, i.e., teaching, learning, assessment, student data management, library services, etc. have become ICT integrated. The major reason for such a wide use of ICT in various sectors, and various educational practices is the speed, accuracy, versatility and cost involved with it. A graphical representation of what is ICT is represented in more details in the figure 1. (Graphic courtesy: Dr.M.U.Paily, RIE, Mysore)

Despite the large potential of ICT in education sector, many educational institutes are not making good use of ICT tools. The challenges are:

- Lack of understanding and appreciating the need for change

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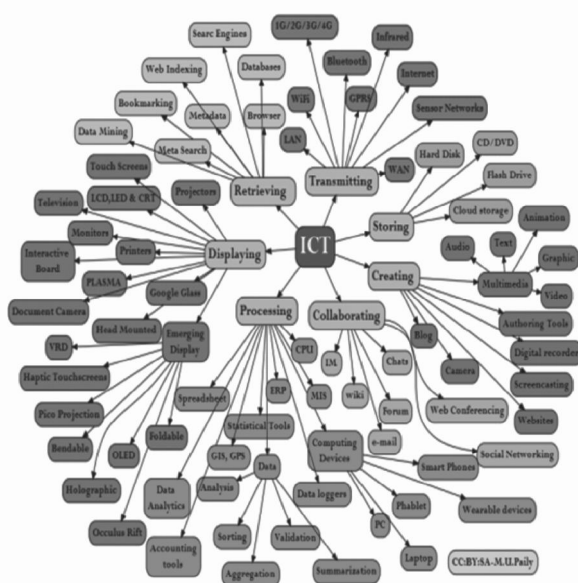


Fig. 1 Graphical representation of ICT

- Many administrators and teachers do not question their professional practices
- Training programs mainly focus on technical aspects of ICT with little or no training on how to incorporate ICT in institute administration and curriculum
- Inadequate support from administrator and peers

This paper describes how the above challenges can be addressed and how effective utilization of ICT can be made a possibility in an educational institute. Further it elucidates how ICT can be used in an educational institute at various levels for enhanced learning, management and administration.

2. Literature survey

The deployment of ICT tools to support staff and students' administrative support services have been identified as central elements in attaining the sound education [2]. By deploying ICT tools, jobs can be effectively handled by minimizing the errors. The author emphasizes the uses of ICT to help staff and students in workshop/laboratory scheduling, tracking/monitoring as well as retrieval of tools, equipment's and machineries.

Simin Ghavifekr et al. [3] highlighted the role of ICT application in various aspects of educational organization, which includes teaching learning process as well as administration and management

activities at different levels of organizations. Overall use of ICT in technical education is beneficial for administration, staff, teachers and students.

The enhanced usage of ICT on functional areas and for general administration will enable enhancement of overall information administration in higher education institutions in the realm of global competitive environment [4]. This study has served as a base for education planers to deploy technology based administration in higher education institutions.

An international survey on teachers' use of ICT tools in education was conducted by Renee Schulz et al. [5]. The purpose of the survey was to find out what motivates teachers to use ICT tools in the context of teaching. The first category of indicated influencing factors comprises human factors like the teachers' skills, attitudes and opinions towards the tools. The second category is about intrinsic values including teachers' satisfaction, level of interest, joy and entertainment. The third category were usability, level of interactivity, adaptability and meeting learning requirements.

ICT plays a wider role in teaching learning activities like, content creation, formative summative assessments, student's performance tracking, training, knowledge management and knowledge organization[6].The research has shown that teaching learning interaction was more productive. Learners displayed an enhanced level of curiosity and willingness to learn even highly conceptual subjects.

Thus it is evident that use of ICT in an educational institute has become indispensable. One way to use ICT in institute administration is to develop an enterprise application to automate many functions. Due to considerable cost involved, many institutes do not have such an application. But without an enterprise application, many aspects of administration can be made more efficient and effective using freely available software. The details of what software, where and how to adopt them at various levels are described in the following sections.

3.Role of ICT in Institute Administration

The 21st century has witnessed tremendous advancements in technology which has led to far-reaching developments in the administrative system. The possible means of using ICT are enumerated in following sections.

A. Push-and-Pull Information

One important aspect of administration in an institute is to pull and push information. Different means of doing this task along with use cases are enlisted below.

- 1) WhatsApp group: This is one simple, efficient and no-cost method to push information to students, as it is widely used by all students. To push information to a large group, a well structured channel is essential. Any program in an institute spans over 3 to 4 years. Each class will have a student representative as a single point of contact (SPOC) for institute administrators. Create separate WhatsApp group of all class representative (CR) from each year. To send information to students of a particular year, post it to WhatsApp group of CRs from that year. The CRs in the group in turn will post it to WhatsApp of their class. Thus information can be pushed selectively to different years of students in an easy and convenient way.
- 2) Google Drive: Office circulars are generally sent in printed form to different department and sections in an institute. The problems faced by this approach are – circulars not reaching departments in time, need of a human resource to send/collect circular, chances of being misplaced and difficulty in searching if not properly maintained. One simple way to circumvent all the above mentioned drawbacks is to use e-circulars. A simple, neat and efficient way to manage e-circular is the use of shared folder in Google drive.

The first step is to create a folder in Google drive and share it with heads of all department/sections, giving them permission only to download the circulars. After an office circular is drafted and printed, get the signature of the concerned authority, scan it and upload to this shared folder. Now, all other department/sections can immediately download the circular. This is an easy and quick means of delivering circular, eliminating the need of human resources to send/collect.

Another major advantage is the ease with which a circular can be searched in the shared folder. The folder serves as a central repository of all circular. This avoids the case of lost or misplaced circular. Any circular can be found with minimum time.

- 3) Free Online Forms: This is the easiest and best way to pull information from students, staff, parents, alumni or any group of persons. Few online forms are Google form, Monkey Survey and Cognito forms. To collect information from a group of persons, create an online form with all fields for required information, get link to this form and share with people from whom information must be collected. One simple method to share the link is to post on target WhatsApp group. The submitted responses will be recorded in excel sheet and it also gives some analysis of the received response in the form of pie and bar charts. Thus one gets the compiled responses immediately with ease and any required data analysis can be easily performed as the responses are in excel sheet.

In an educational institute, few use cases of online Forms are to get - faculty/course feedback from students, feedback from participants of a workshop/talk, details of students/faculty interested to participate in an event.

- 4) Collaborative Editing: Many a times, a document needs to be prepared by gathering information from a group of persons. It is more convenient to let the entire group work on a single document using collaborative editor, by setting appropriate permissions to different sections of the document. Few collaborative editors are Google docs, Google sheet and Google slides.

This also lets to know the progress of editing done by individual without the need to talking to them frequently. Further, this avoids the need to merge information from several documents into a single document, saving enormous amount of time. The Principal/HoD office can use this approach to collect information from all departments/staff members.

B. Assignment and Monitoring of Tasks by an Administrator

An important function of an administrator is to assign tasks to individuals and monitor its progress. A software tool to enable him to keep record of tasks assigned to persons and to know the progress made is most essential. This can be easily performed by using collaborative editing.

The method to adopt this is explained here. Let the administrator use Google excel document, name each

sheet with names of the persons, to whom tasks are to be assigned. Share this document with all concerned persons, by setting security for each sheet and for specified area within each sheet. Thus information in sheet is secured. When the administrator gets a new task, he will assign to a person by recording it in the sheet of that person. Now, the assignee will know the new task assigned to him and he regularly updates progress of the assigned task in the same sheet, which administrator can immediately see. Thus without additional communications through mail or phone call, administrator can easily know the status of all tasks he has assigned. He can also give additional remarks/suggestions in the sheets and assignee immediately takes note of them.

Thus this is one simple, neat and efficient way to assign tasks and monitor their progress. This approach finds several use cases in an institute.

C. Scheduling

A good schedule of all academic activities and strict adherence to it is essential for the success of academic year in an institute.

1) Calendar of events: Good governance prepares the calendar of events for a semester/year well in advance, which also includes dates on which department/section must send required information. The calendar of events is given to all required departments/persons in advance. But still few departments may fail to send required information as per the announced date in calendar. One possible reason is that they may have forgotten. To address these cases, reminder circular must be sent prior to the scheduled date, by office persons.

One simple solution to this is to automate the process of sending reminders, by using a software tool – Google calendar. Google Calendar is an internet-based time and task-management online application that allows for access to calendars via web browsers. After the calendar of events is prepared, use Google calendar to record complete schedule, make settings to automatically send reminder mail/notifications few days prior to the deadline for all registered events. Calendar will automatically send reminder mail/notification to all events on specified dates, without the need of any additional human intervention.

D. Managing Shared resources in an Institute

Several resources like seminar hall/auditorium in an institute need to be shared among different department/section/associations. The supervision of these is entrusted to an individual/department. In order to use a resource, one must contact the in-charge person to find its availability and then block it. This needs extra time and effort.

One solution is to use create a Google calendar for each shared resource; share it with all heads of department/section with appropriate security settings. Thus, schedule of are source can be seen by all from the calendar and the interested department can accordingly fix a date and time to use that resource, send a request mail to in-charge person. This person approves the request and blocks the date and time of that in the shared calendar of that resource, which is immediately seen by others. This leads to easy and efficient means to manage shared resources in an institute.

4. ICT Tools in handling a Course

“Great teachers are good learners”. In addition to learning advancements in technology, it is essential that a teacher learns to use technology to improve teaching and learning process (TLP). There is several number of ICT tools developed and used in teaching. From our experience, few simple tools which can be meaningfully used in TLP are described in this section.

A. multimedia

Multimedia is the use of text, audio, graphics, video, animation and interactivity in a coherent manner. This has become integrated in all aspects of one's life and has been widely used in the education sector. The different ways one can use it are - individualized instruction, collaborative learning, computerized assessments and presentations. There are several “simple to use” tools to create powerful presentations to be used in classrooms. Students can also be given assignment to create such presentation, which improves their creativity and skills to use tools.

B. Use of Online Courses

There is large number of very good online courses on a wide range of subjects and technology and they have exploited the full power of ICT to achieve

effective outcome based learning. “A good teacher must be a good learner himself”. In order to utilize online courses in several ways, the first step for a teacher is to undergo these courses themselves. This experiential learning can then be adopted in teaching, giving meaningful assignments/projects, assessment and encouraging students to take up online courses. Few websites are NPTEL, SWAYAM, edx, coursera, udacity, udemy.

C. Assessment Tools

A good number of free online tools are available to conduct quiz viz. Google form. The questions have to be filled in the form, students are asked to take up online quiz and the responses of all will be recorded in a spread sheet which can later be evaluated with more ease and this will be completely a paperless method. If the questions are multiple choices based, then Google form can be made to do automatic evaluation and the scores can be immediately shown to the participant and recorded. All the responses and scores will be available in a spread sheet for easy documentation. One can create interesting and challenging quiz with ease using Google forms. Word press is more powerful than Google forms, as it can randomly pull questions from a question bank for each participant, auto grade it and generate final report.

Grading of programming assignment is a time consuming task, more so, if the number of students are large. Few online auto graders are available but they are not free. But with little efforts, one can get an auto grader developed by software professionals/students within the institute. An auto grader runs the submitted program for all test cases, checks whether generated output is correct or not. Finally it generates a summary of all test runs and their success. Thus it is possible to automatically grade all programs done by students, easily managing large number of students.

Assignment submissions can be made online by letting students to upload assignments into a shared folder in Google drive. This simplifies task of submission for students, and the benefit of easy collection, grading and maintenance of all submitted assignments for teacher.

Rubrics have become popular with teachers as a means of communicating expectations for an assignment/seminar/project, providing focused feedback on works in progress, and grading final work. There are several free tools to help teachers to

create quality rubrics vizRubristar [7]. It helps to get away with the tedium of creating rubrics from scratch by allowing us to customize one of many available template rubrics. One can use ready rubrics and modify the templates to better serve their student's needs.

D. Social Media Network

Social media networks provide teachers with opportunities to get connected with students and offer instant opportunities to communicate. These Online communities created in these social media spaces provide opportunities to share resources, spark questions that expand collective learning.

A much simpler channel is WhatsApp group, which can be effectively used by teachers to enhance learning, imbibe better human values and to know each student better. But for this to be effective, teachers must devote some time to post messages and reply to student queries, which must be treated as their duty and service to student community. This gives an added opportunity for him to know students better.

For programming courses, students can be asked to post the screen shot of their program output in WhatsApp group, which can be immediately reviewed/commented by teacher. The post by few students and teacher's appreciation words encourages remaining students to “get their hands dirty” in coding. This has proven to be very effective in motivating large section of students to work more on coding.

E. Software/Simulation Tools

Experiments are integral part of many courses and research work. The experimental results need to be analysed and demonstrated, which can be best done by software tools like MATLAB, Scilab, etc. Few concepts can be better understood using simulation tools. Thus wherever possible, teacher must use simulation tools to deliver contents and/or make students to perform assignments using them.

F. Graphics Programming Packages

Programming skill is essential for technical courses, which is generally assumed to be difficult to learn. But learning can be made more interesting, simple, joyful and effective using graphics programming packages like Scratch, Green Foot,

BlueJ, Alice, etc. As a first step, introduce students to these packages; make them to develop simple games or animation on their own; arrange for a demonstration of all developed games/animation in the class. In this process, students acquire better programming skill and become more confident in coding. This approach has been proven to be very successful in our institute.

5. Responses

The experience of using the above tools in our institute has been well appreciated and is now accepted by administrators and other faculty members.

The informal feedback by an administrator-

“It is difficult in the beginning but now it is very easy and fast way to work, has improved the productivity of ministerial staff”.

A teacher said -

“Lot of time needed for the first time to prepare lesson notes, later easy to use in future and modification can be made. ICT tools are very easy and convenient to collect feedback, conduct quiz and to make analysis”.

Students also expressed happiness about the use of ICT tools in teaching and administration.

6. Conclusion

The use of ICT tools in an institute is now becoming essential for the success of an education institute. The knowledge and experience of various ICT tools and their use cases are discussed in sufficient details. This provides enough information for any novice person to make a beginning to use them in administration and/or course delivery. The distinguishing aspect is the ease and convenience with

which all tools presented in the paper can be adopted immediately, without additional cost. The use of these tools has resulted in significant improvements in administration efficiency and teaching learning process.

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