Praagyah: Computer aided Gurukul System through Cloud Computing

Dr. B.Santhi[1], Girish.G.Koundinya[2], Jaikumar Ganesan[2]

[1] Professor, Department of Information and Communication Technology, Sastra University
[2] Department of Information and Communication Technology, Sastra University

Abstract

The shaping of future generations depends on an education system that aims at a holistic development of a student. This paper proposes an education model which is a mixture of a traditional educational system and the latest technological advancements. The Gurukul way of learning was pioneered and practised by early Indians; we have discussed, in this paper, some illustrative examples of how the practise led shape to a more complete student. The current education system has a shift from quality education to education to the masses. The central figure of Guru, who would imbibe in his students both knowledge and character, is also lost. The Gurukul tradition provided a more personalized learning experience where the Guru would judge his pupil and understand his strengths and weaknesses. An ideal system would be one that provides a personalized learning experience to everyone. Such a system in our modern times is only possible by using the technological advancements available, in particular the increased research and development of Cloud computing technology. The increased availability of educational resources, a student analysis mechanism and an educational system modelled on traditional methods would not only intellectually improve students but also make them aware of moral values. The general misconception that technology would replace the human teacher is vanquished in our discussion. This paper suggests an approach would ensure that the potential of each student is developed to the maximum level by using the new vistas opened up by modern technology.

1. Introduction

"What sculpture is to a block of marble, education is to the human soul", one cannot agree more with Joseph Addison's words on education. Education forms the foundation on which generations are built and the system that provides education should be structured with care. In ancient India, the Gurukul system of education flourished. The advantages of such a system were manifold. It was typically a residential school with students living with their teachers. The teachers acted as both guardians and examples for their students to follow. Education was imparted freely with students performing some chores for their teachers. There was a healthy interaction between the teacher and the student and the Teacher was able to understand the student completely and mould him into a man with profound knowledge and wisdom of this world. The decline of the Gurukul system came mainly due to need to inability to find teachers to teach a larger student body with individual attention.

The modern education system that replaced the Gurukul and which continues today is one with many flaws. The objective of the education model faced a paradigm shift from one that moulded students individually to one that produced students by the dozen. An industrial, factory line mechanism of teaching that is doled out by the current system, is very one dimensional. Creativity is lost, and education is more syllabi-centric rather than student-centric. The mind of a student has become a mere storage for data instead of being the engine which churns out ideas, that it was initially designed to be.

Revamping the current educational system and incorporating features of our traditional Gurukul system would yield tremendous results. As explained in [3] the power of cloud computing can be used to aid teachers to provide students with the guidance they require while taking into consideration their individual characteristics. Cloud computing technology allows storing of data and applications on a server. A user with the help of a basic system and broadband connection is then allowed to access the cloud and retrieve or use the application stored in the cloud.

There are 3 main models in cloud computing.

1) Infrastructure as a Service (IaaS)

2) Platform as a Service (PaaS) 3) Software as a Service (SaaS) Combining cloud computing with learning forms a potent mixture that enables us to implement the features of the Gurukul system

Praagyah is a Sanskrit term for the Learned, emphasising on the need for a Guru who is not capable of providing intellectual knowledge but also someone who is aware of the needs and requirements of his pupil , we have named our idea thus.

2. Gurkul: A Traditional Learning Model

A gurukul is a type of school in India, residential in nature, where the sishyas (students) live in propinquity to the guru(teacher). In a gurukul the students live together and are treated as equals irrespective of their social standings. The guru observes the attitude, aptitude and the ability of the children and educate them accordingly and this was done without any interference from external source. So the guru was able to match the individual's temperament with the field they learn. Some of the interesting features of gurukul are:

- Education was free and accessible to all who sought it.
- Pupils were taught, individually, not en masse by the class method.
- It was not merely intellectual. It included realization of moral values.
- Discourses, discussions, comparative study and harmonising different aspects of branches of knowledge, etc were te other salient features of gurukula system.
- Main aim of Education was to learn and gain knowledge and exams were conducted to test the knowledge of the student
- A Gurukula facilitates mutually respectful, open, honest and heart-felt communication between the teacher and the student
- The entire system was transparent and common.
- Another distinguishing feature in gurukul is that the students psychological profile are monitored regularly.

 The gurukul had a huge impact on the lives of many great people. A prime example for it was Lord Rama. He was considered to be one of the finest human being of all times. The qualities that he possessed Bravery, Kindness, Justice, Obedience, Intelligence, Patience, Universal, Love, and Being Dutiful were considered to be those possessed by a perfect human being, added to that when Lord Rama was disillusioned by facing the realities of the world, the discourse given by his guru sage Vashista in his gurukul, provided answers to all questions Lord Rama had in his mind. This made him attain enlightenment. All this was possible only because Lord Ram lived with Vasishta, which enabled him to comprehend Lord Rama's character so as to clear the doubts in his mind This highlights the importance of guru and the gurukul system. The gurukul system not only had great impact in the life of Lord Rama but also many other equally great people like Arjuna, Lord Krishna.

3. Case Study : Kalakshetra Foundation

Kalakshetra Art Village is an institution that has come up with the idea of promotion and cultivation of different types of Art Forms that were prevalent in India but now have gradually lost their importance. It follows a system that has features of both institutional system and the guru-sishya parampara. In this institution the fundamentals of art have been structured into a curriculum so that there are no gaps or imbalances in the basics of learning technique, and added to it the guru guides the student as a mentor, from the initial stages till the student turns out to be a professional. The students always has access to his/her teacher and have the right and personal responsibility to seek the best training available. This one of the foundations which has been successful in implementing the combination of traditional gurkula system and the modern system in right proportion.

4. Cloud Computing and E-Learning

The latest buzz word in computer domain is the word that is synonymous with the internet, "the cloud". In section 1, a few applications of cloud computing services were listed. Cloud Computing has come to focus mainly due to the need for information anytime and anywhere. As explained in [1] Cloud Computing, is the process of accessing a remote repository either for information or a program. The utility of this can be comprehended by understanding that, in order to have these resources in our computer, the hardware requirements would be immense. Cloud computing therefore is a cost-effective measure of ensuring that data is available to everyone as long as they have minimum required hardware.

E-Learning is a mode of learning using the internet and computer as tools for educating students. As explained in [2] by combining cloud computing with e-learning we can form a potent formula for new age learning.

5. Praagyah

Our proposed method would work as follows, and an explanation how this will be used by schools, students, teachers -

1) Technical Aspects

We will be mainly using a two layer cloud. One will be a regional cloud and the other will be a central cloud. The central cloud will be holding educational resources in various formats like text audio video etc. This layer is mainly to facilitate sharing of resources, thereby bridging gaps between rural and urban schools as both will have access to quality education.

The second layer is the regional cloud. All the schools of a particular region will come under this cloud. This cloud is a repository of school related data and also information regarding a student. The advantages of such a system are that all the information about a student can be obtained from a single source. The types of data to be stored in regional cloud are-

- School related information- Basic information about the school. The number of staff it employs and facilities it offers.
- Student related information- Basic information about the student. Name , Class, Achievements.

To access the cloud the school needs a minimum hardware requirement of a Desktop Computer/Hand Held Device with internet connection, a projector though not mandatory would increase the reach to a larger audience.

2) Continuous Assessment

There will be two types of assessments.

1) Student assessment – Regular tests will be conducted by an application which is hosted on the cloud and this application will automatically update the test results in the student table. This can be used as a measure to calculate the level of understanding of the students and how they perform under a particular model in which they have been placed. If their performance is not up to a certain level then the application will suggest a change in model of teaching for the teacher. Enabling the teacher to guide the student and helping them correct their errors.

2) Teaching Staff assessment – The teaching staff will be graded based on the basis of how the students perform in their assessment and how far a teacher uses the cloud technology and whether the teacher is open to the suggestions made by the application.

A Local administrator will have access to both of these assessment results. A score will be provided by the Local administrator based on the results and a Central administrator will provide suggestions to improve the score and these suggestions will be forwarded to the school by the Local administrator.

3) Personalized Learning

The current working model of a school is a very primitive one wherein the needs and capacities of a student are not taken in to consideration while providing education. Since the way every student perceives a particular a topic is varied it is essential to teach them in a particular way that would maximize their learning potential. A student "A" may be more comfortable learning by hearing. While another student "B" would be more comfortable learning by writing it down. So a question arises on how to cater to their different needs of students. Having a very personalized education system for a country would not be economically viable nor does any country possess the required amount of teaching staff. So the only solution would be to broadly classify students and into different models and matching these models to the best possible way in which a teacher could reach the students. The regional cloud as described in section 2.1 will host a program containing psychological questions. The program would then, based on the results, place the student in a particular model, most suited to his/her needs. This information will be stored in the regional cloud and the teacher may then access it and then teach the student in a particular way.

4) Used By Schools

Schools will be accessing both layers of cloud. Before they can enjoy the facilities, they must register themselves in the programme. This is to ensure there is a healthy exchange of learning resources. The Schools on registering can access resources but also must provide information regarding to the school in the regional cloud.

5) Used By Teachers

The core idea behind the Gurukul system was the understanding that was formed between the teacher and the student. Our method proposes to establish this understanding by using Personalized Learning system explained in earlier section. The teacher or the Guru with the aid of computers would have complete knowledge of his/her student and then would proceed to teach them in way that would ensure that they understand perfectly. It is imperative to note that this technology does not replace the teacher but provides a means by which the teacher can better understand the student and act with the student's best interest in heart.

5. Implementation

A regional and a centralized cloud will work in tandem. The regional clouds will be completely under the jurisdiction of the Local administrator.and the central cloud will be under the control of central administrator. The local and central clouds will be data repositories and the educational council will have to provide the necessary resources. Applications will have to be developed to answer the requirements of the various functions which have been discussed in the earlier sections. A school has to register in order to gain access to educational

resources and they must also have the required hardware. Cloud computing reduces the hardware requirements to the bare minimum and thereby reducing the expenditure to a great extent for the schools which are not in a financially strong position. After a school has been successfully registered the teaching staff have to be registered and then the students. The student registration is followed up by the test as explained in section 3 to categorize them in to specific models. The application will then prompt the Local administrator and also update him about statistics regarding the school, students and staff. The system provides on demand education by the means of the educational resources stored in the centralized cloud.

6. Conclusion

Real education is process in which one's embryonic qualities are refined so as to fashion out an ideal human individual, capable and willing to play his part for the betterment of human race. Pragyaah system proposed in this paper offers a solution to quench the thirst for quality education among people of all classes and also provides an opportunity for differently abled to get regular education built on the guidelines derived from the age-old Gurukul System. Considering the advantages of this system we suggest that this system when implemented will undoubtedly bring the standards of education to a greater heights.

7. References

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