

When Technology Meets Health Care in Knowledge Society...

Aurosiksha: online learning platform for blindness prevention workers

"Intelligence and capability are not enough. There must also be the joy of doing something beautiful. Being of service to God and humanity means going well beyond the sophistication of the best technology, to the humble demonstration of courtesy and compassion to each patient."

- Dr. G Venkataswamy (Founder Chairman - Aravind Eye Care System)

Abstract: This case study (www.aurosiksha.org) is about two great movements one in Technology (the FOSS) and the other in Health Care - the Aravind Eye Care Systems (AECS) and LAICO that trains blindness prevention workers. At the confluence of the two is an eLearning platform called Aurosiksha, which is based on Moodle. Aurosiksha seeks to reach out to the global user, share its rich knowledge base, and in the process create a community of lifelong learners.

Keywords: FOSS, ICT, LMS, MOODLE, mLearning, Mobile Moodle, AECS, Aravind, Aravind Eye Care System, Vision 2020, WHO, LAICO, Aurosiksha, eLearning Platform, knowledge society, social health care.

Introduction

As we all know, the Free and Open Source Software (FOSS) movement began as a renegade call to what was felt to be increasing restrictions on collaborative development, distribution, and ownership of software^[2]. Free software focuses on the philosophical freedoms (a matter of liberty rather than price) it gives to users, whereas open-source software focuses on the perceived strengths of its peer-to-peer development model. Openness, co-ownership, and transparent collaboration continue to drive the FOSS movement. Development, modification, ownership, and redistribution of software could now be cohesively managed by communities of like-minded developers. This also led to an evolutionary model of copyright and licensing (GPL) ensuring community ownership.

The FOSS movement has evolved from the stages of philosophy and licensing into a complex and pragmatic ecosystem for software production and distribution benefiting humanity globally. FOSS has introduced technological self-reliance, efficient use and sharing of resources, and

collaborative innovation and development. One of the most significant areas where the FOSS movement has made strides is in the field of education. During the past decade, education has been rapidly reorganized to leverage information and communication technology (ICT) within the classic teaching-learning-assessing cycle.

At the foundation of FOSS is a desire for an equitable and open model of access to knowledge.

If one of the aims of FOSS technologies is dissemination of educational content, then Aurosiksha is a case in point.

The Case

Aurosiksha is an online learning management system (LMS). An initiative launched recently (25th July, 2011) in its beta version by Lions Aravind Institute of Community Ophthalmology (LAICO), established in 1992 with the support of the Lions Club International, SightFirst Program, and Seva Sight Program.

LAICO is Asia's first international training facility for the broad range

of blindness prevention workers from India and other parts of the world. It contributes in improving the quality of eye care services through teaching, training, capacity building, advocacy, research, and management consultancy. It offers university-affiliated long-term courses in Eye Care Management, with eye care management programs for directors of eye hospitals, program managers, as well as several skill development courses in the areas of instrument maintenance, community outreach and social marketing, counseling in India, Africa, and South East Asia.

LAICO accomplishes this objective within the broader environment of Aravind Eye Hospitals and Aravind Medical Research Foundation - all aspects of AECS. Headquartered at Madurai, India, AECS is the world's largest eye care service provider, which performs 300,000 surgeries per year. Aravind Eye Care was founded and directed by the legendary Padmashree Dr. G Venkataswamy known as Dr. V.

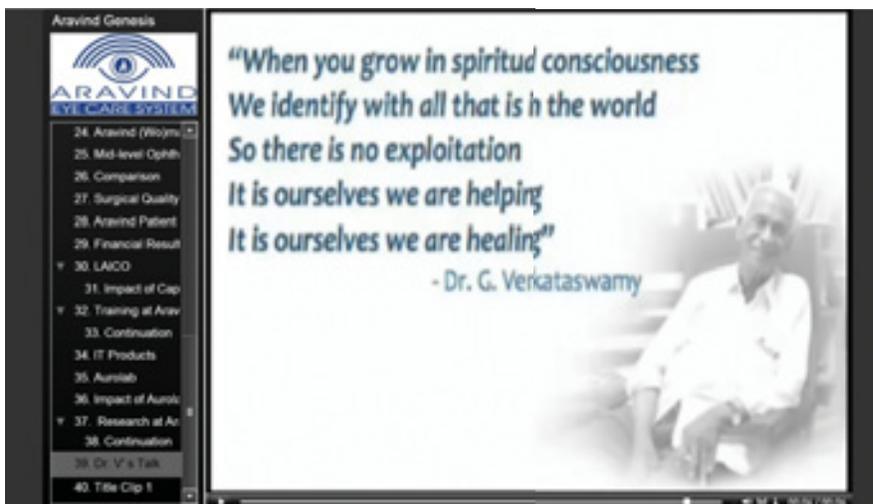


Fig. 1: Inspiration and Inspirer

Tranferring the Aravind model around the world



Fig. 2: LAICO's global reach

Designated by the World Health Organization as a Collaborating Centre for Prevention of Blindness, Aravind is studied as a model in prestigious business schools around the world, including Harvard, Stanford, Michigan, IMD-Lausanne, and the Indian Institutes of Management.

Currently, LAICO works with over 270 hospitals across the developing world replicating Aravind model of high-quality, low-cost eye care service delivery. Follow-up studies have shown that several of the programs exposed to the Aravind model have doubled (and in some cases even tripled) surgical productivity and as a result are now financially self-sustaining.

The Challenge

The real challenge for knowledge society then is in creating equal opportunity in offering the ability to access, to create, to develop, and to utilize the right information at the right time in a cost-effective manner. This applies to the public (consumer) as well as the service provider professionals.

In this case study, we focus on a decisive initiative with the objective of providing quality training and management skills via the virtual medium for eye care, which is an important area of social health care.

- How do we train more than 10,000 blindness prevention workers worldwide, year after year, across

270+ hospitals (and still growing) that are partnering with Aravind?

- How do we create courses that cover the broad needs of our trainees that include paraprofessionals, ophthalmologists, eye care program managers, administrators, and others?
- How do we continue to empower our all-women team of paraprofessionals who form the backbone (about 60%) of Aravind's workforce? Since

most of them come from humble, rural background and are trained as assistants and nurses, can this eLearning platform give them the opportunity for continuous training?

- How can eLearning work consciously toward the empowerment of women and gender equality - an important objective within the Millennium Development Goals?
- How do we collate, aggregate content to create an interactive

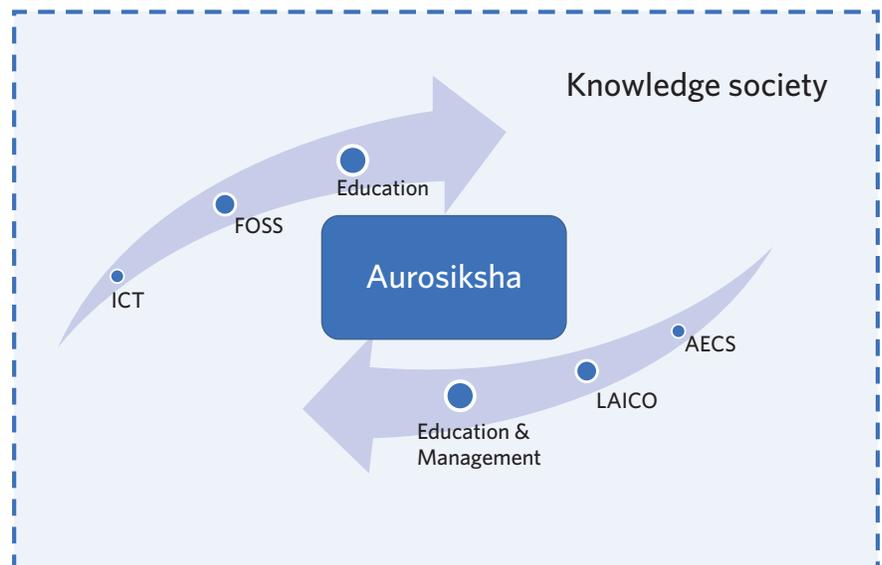


Fig. 3: The case for Aurosiksha



Fig. 4: Aurosiksha home page and introduction

ophthalmic technology evolving so quickly, everyone recognizes the importance of keeping our eye care management skills and knowledge up-to-date for the benefit of our patients. The eLearning solution will allow especially the paramedics to access continuous educational opportunities over the Internet and provide a valuable forum for our members/experts to exchange views and tap into the expertise of their colleagues and fellow colleagues around the world."

Aurosiksha has leveraged ICT in an inclusive way. It is meant to provide a one-point Internet access to eye

care training for professionals worldwide with the premise that 'up to 80% of the world's blindness is avoidable...' where 'avoidable blindness is defined as blindness which could be either treated or prevented by known, cost-effective means' (VISION 2020 Action Plan 2006-2010 © World Health Organization).

The Solution

Aurosiksha - the need of the times

LAICO came up with Aurosiksha to enhance the reach and quality of education drawn from the rich knowledge base that AECS has harvested since 1976. In this age of knowledge society, its four essential characteristics - digitization, immediacy, virtualization, and globalization - drive knowledge sharing.

Aurosiksha was developed and implemented by the LAICO team with the help of instructional designers who joined the AECS as volunteers for the sole purpose of developing its own online educational program.

Promoting lifelong learning

The goal is to allow all users to take highly engaging and interactive units in order to learn about the theories, techniques, and practical aspects of both clinical and nonclinical management. The idea is to provide an online space where AECS staff can learn, share, and develop their knowledge of providing the best eye care services in all aspects ranging from fundamental concepts to advanced skills using assessed, accredited, and self-reflective activities and resources.

The program

The program includes:

- **Courses & stand-alone sessions:**

These have been developed by internal and external subject matter experts (SMEs) with the assistance of instructional designers and technicians by using standard training curriculum. They are also assisted by JCPHO, ICO, and other professionals from leading non-eye care institutes, such as the Indian Institutes of Management (IIM). Quality

training mechanism that does justice to the enormous data and experiences that Aravind has collected over decades and share it with the world so that other blindness prevention professionals and social entrepreneurs may feel inspired to create Aravinds elsewhere?

- How do we create a viable way to share this ocean of aggregated experiences into meaningful content harvested since 1976?
- How do we instill the Aravind model into our courseware? Especially since the Aravind model needs to be 'lived' and 'experienced' as a broad set of values of service, compassion, and self-reliance at its core, along with management principles that identify quality care and efficiency that Aravind stands for?

These were perhaps the broad questions that LAICO asked itself after it trained and consulted 60 hospitals in 29 countries and 213 hospitals in India^[1].

On the eve of the launch of Aurosiksha, Mr. R D Thulasiraj, Executive Director (LAICO) said, "I think this is a very important development and underscores the AECS's commitment to continually enhance the range of services we offer to eye care service. With

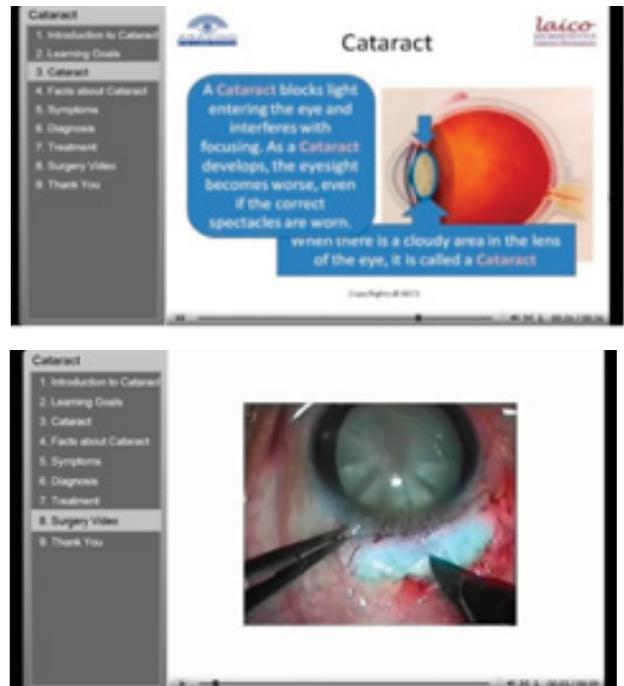


Fig. 5: Course on cataract

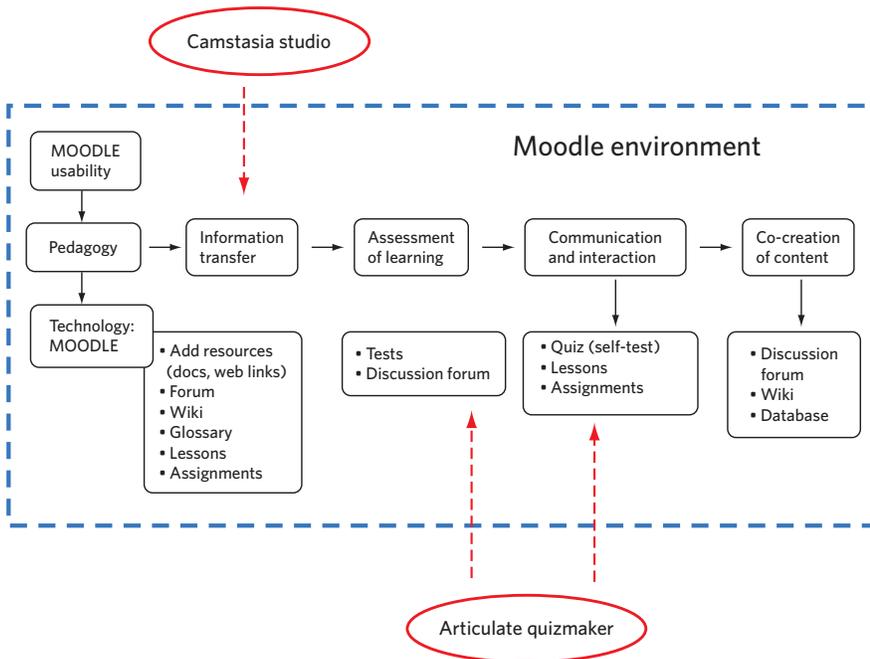


Fig. 6: The Moodle-based Aurosiksha environment

check is performed by including sessions in Aravind's acclaimed training program. The material is interactive with voice narration, with short quizzes in between videos to assess the learning.

- Assessment with immediate feedback:** Assessment is featured in different ways like an organized discussion forum, Q&A forum, blogs (students are allowed to create), and exercises/quiz. After quiz/exercises, immediate feedback will be given to the student on each submit. For example, if a student chooses a wrong answer, the feedback will spell out why the answer is incorrect and give the correct answer to ensure learning is happening with each and every activity.

- Course completion tracking:** The tracking feature controls the student/teacher to provide a better learning/teaching experience. The tool gives accurate course completion and grading report. This includes customized reports for the beneficiaries on the impact side.

Selecting the tool - a confluence of spirit and values

LAICO's systems division began with an open mind and explored various Content Management Systems (CMS) and related technologies (Course Management Systems) both proprietary and FOSS, such

as WizIQ, Joomla!, ConferenceXP (an open-source videoconferencing platform from Microsoft Research), and MOODLE (abbreviation for Modular Object-Oriented Dynamic Learning Environment).

Echoing Aravind's values - quality, compassion, self-reliance - Aurosiksha's objectives resonated with Moodle. At its core, Moodle is an educational

software grounded in a philosophy of collaborative learning, often referred to as social constructionist pedagogy. Additionally, Aurosiksha's pedagogical approach matched with that of Moodle. The organization and design of Moodle's interface supports learners and learning tasks, rather than technology and tools.

Moodle presented the ideal vehicle for Aurosiksha. LAICO adapted its knowledge resources to the Moodle mould; customization was minimal.

It was a happy confluence of technology and LAICO vision; both shared the same spirit and values.

Moodle is based on a social constructionist approach, which helps us understand how learning happens in a group and how learning is a product of innumerable human choices. Moodle was built with elements and tools that embody pedagogical understanding. A Moodle-based course can consist of lessons, including reading materials, activities (such as quizzes and projects), and social events that encourage participation between students.

In Aurosiksha, one finds the Camstasia Studio software to be integrated in Moodle for quality and streaming-like videos for the audiovisual elements in its courses.

Similarly, Articulate Quizmaker handles the self-test modules at the end of the lessons.

An open (institutional) learning environment

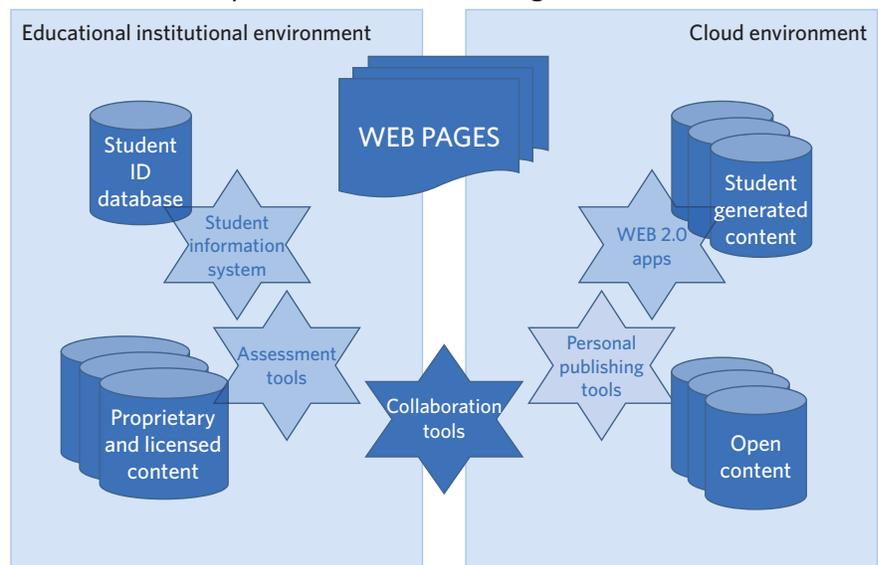


Fig. 7: Open learning environment

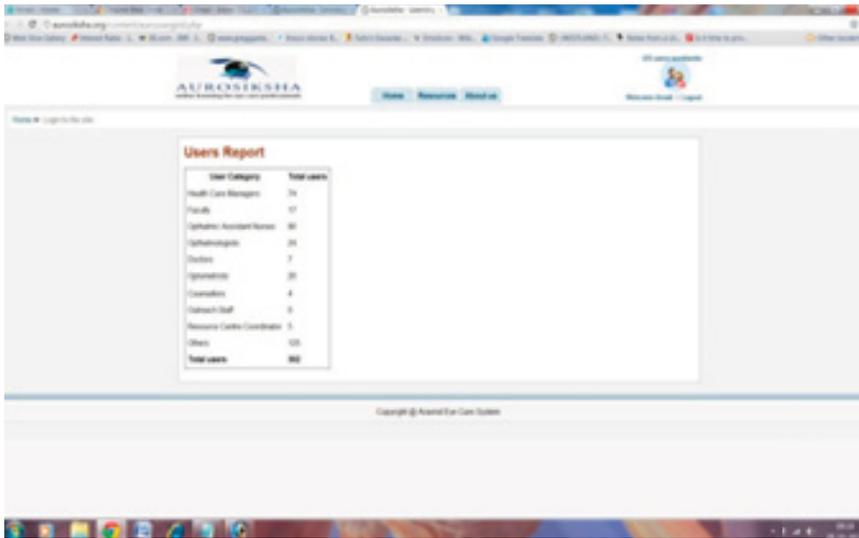


Fig. 8: Beta users statistics

As Aurosiksha grows in terms of content repository, user base, and feedback from users, it will trigger a proportionate scaling in features, tools, and technologies within and outside Moodle.

The following pointers can be considered for Aurosiksha's future:

- Interoperability: Aurosiksha may want to communicate and share its data with that of other medical research institutions. It also needs to be SCORM-compliant (Sharable Content Object Reference Model).
- Deeper reach with low-cost handheld devices and low Internet bandwidth leading to low footprint m-learning: With greater penetration of ICT and hand-held devices ranging from tablets (such as Akash) to mobile phones (voice and short messaging services), a stripped-down version of Aurosiksha can be

An open learning environment: Moodle and Aurosiksha

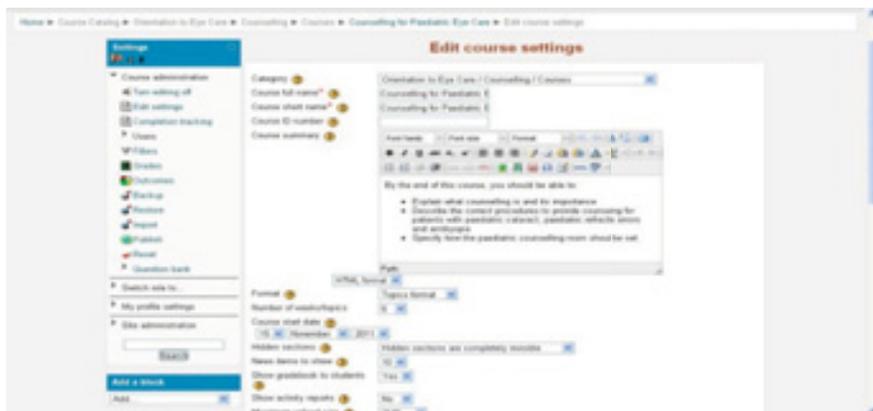
Apart from being part of FOSS family and therefore free, Moodle is an Open Source Course Management System (CMS). It is also known as an LMS or a virtual learning environment (VLE) and is very popular among educators around the world as a tool for creating online dynamic web sites for their students.

Aurosiksha as the learning arm of LAICO-AECS is an experiment in a similar space, moving from Constructionism to Constructivism - an environment in which human beings don't just act (Construct) but also make sense of their actions as a group (Constructivist). This happens as humans make sense of reality, learn and create new knowledge continuously while learning. Effective learning happens while learners are in an actively constructing knowledge mode rather than in a passive reading, viewing, and memorizing mode.

The kind of knowledge generated impacts attitudes of learners, which in turn reflects in their actions (practice). Aurosiksha is a Community of Learners in the making, offering insight and reaching out with a sense of service.

Future Direction

Aurosiksha, in its beta stage, is currently being tested by over 500 beta testers worldwide that range from paraprofessionals, managers, eye care professionals to faculty members.



Administrator: course creation

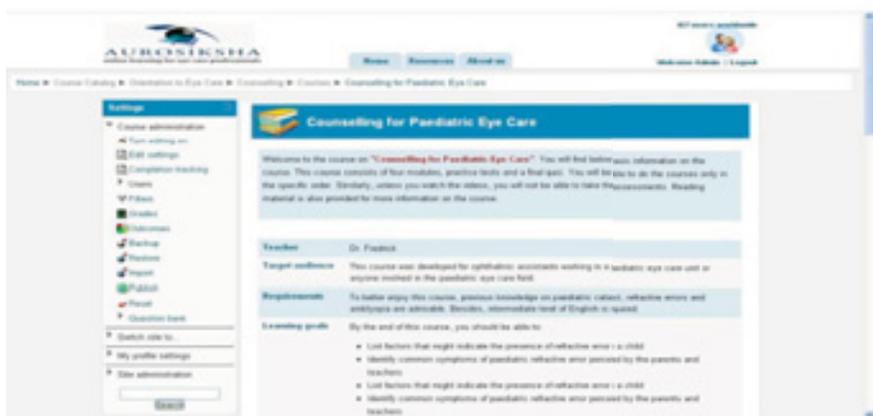


Fig. 9: Course creation

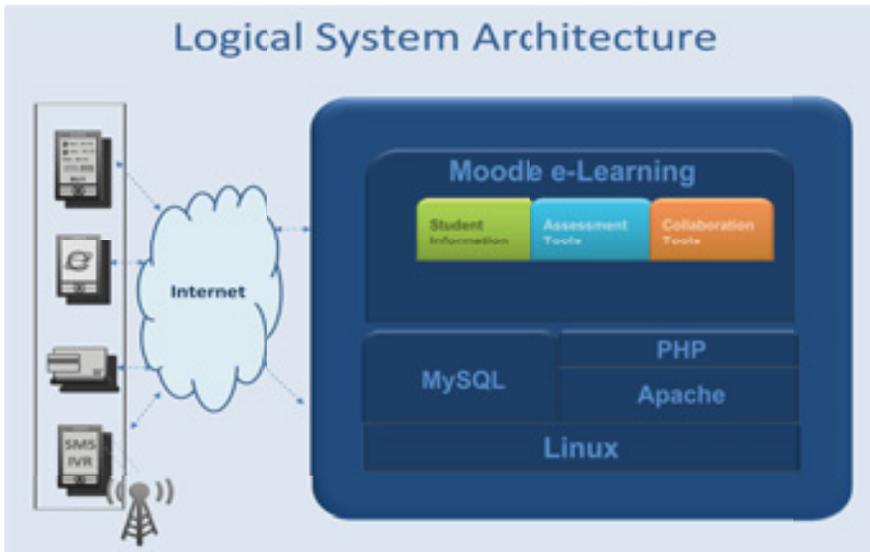


Fig.10: E- and M-learning: logical system architecture

a source of knowledge to especially paraprofessionals on the field.

- Extensive reach with browser-based handheld devices leading to m-learning: With proliferation of 3G and upcoming 4G, Aurosiksha can be experienced on devices, such as iPhone, iPad, and Android-based phones quite extensively with Mobile Moodle (a set of mobile apps and server components from Moodle).

- Right now, Google Analytics and Google Maps are being applied to study the online learning behavior of the beta users. This initiative could be further explored with other statistics generated dynamically.
- Relevant pedagogical applications that can be included (already available in Moodle) are as follows:
 - Grade report
 - Timer-based courseware

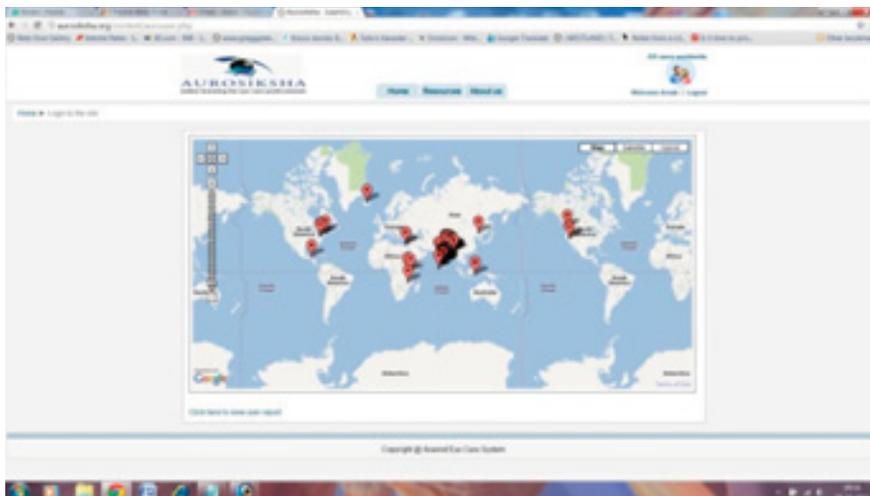


Fig. 11: Google maps: geographical spread of beta users

- Mentor-guided courseware
 - Turnitin (functionality to let the student submit assignments)

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