

## Bridging the Learning Divide

– A Framework to leverage Open Courseware and Computing Resources for Enhanced Learning

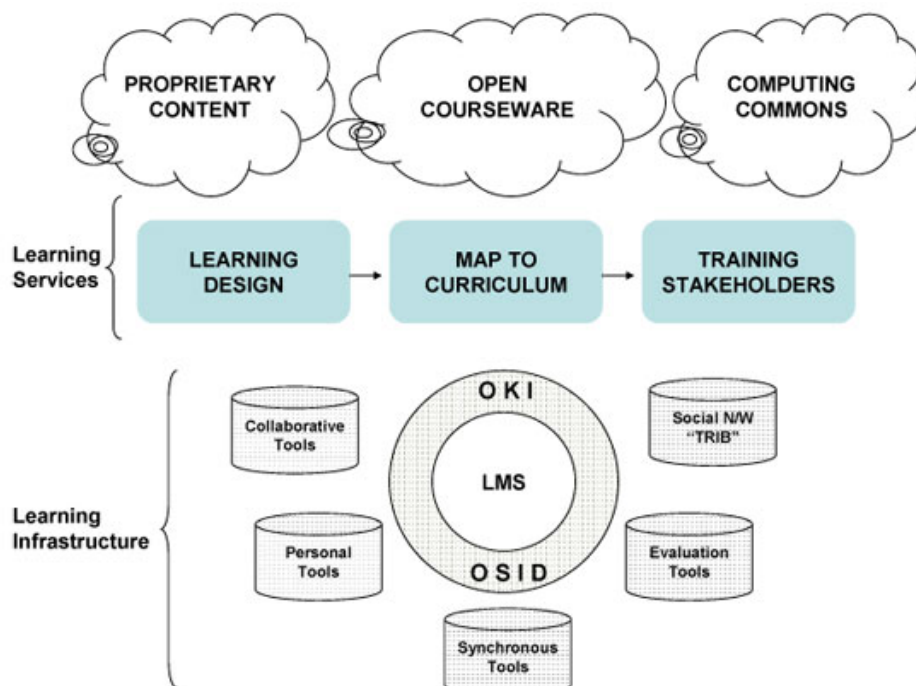
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### Introduction:

There is paradox in that, while there is today an abundance of resources and tools for learning made freely available for academic consumption; the actual systematic adoption and use of these resources especially open courseware for formal accredited learning is sparse. There has been much analysis on this and some of the factors hindering the adoption of open resources for learning include:

- Open Courseware is available in monolithic chunks
- Difficulty in separation of Content, Context and Presentation
- Available resources do not map to local curricula
- Lack of development of a learning design that incorporates use of not only open resources, but also effectively engages the local learner community in the institution.
- Lack of learning infrastructure capable of leveraging open resources, and supporting
- Contemporary learning design.
- Stakeholders within institutions not trained on the use of Open resources as a part learning design or the enablement of peer to peer learning support.

The framework below attempts to address the above listed issues and lay a sustainable foundation for academic institutions to leverage open resources to enhance the effectiveness of their learning programs.



## Open Learning Framework:

The following components comprise the proposed Learning framework:

- a. Learning Resources
- b. Learning Services
- c. Learning Infrastructure

### A. Learning Resources:

There are three types of resources that academic institutions have access to in the framework. They are

a. **Proprietary Content:** This is content that is copyrighted to an individual or entity, and generally requires express license for its use and dissemination. This type of content is generally available through commercial publishers of course materials. The advantage with these resources is that they are usually organized in order to enable faculty and institutions to easily incorporate them into their courses to address specific curricula. These generally also link up well with popular learning systems.

b. **Open Courseware:** This is courseware published under the 'Creative Commons' license and made available online by a variety of participating members of the 'Open Courseware Consortium'. This courseware is freely available for use and incorporation by academic institutions, their faculty and students to further their learning programs. While the greatest advantage of these resources is their open licensing policy and free availability, there can be difficulty in using them in other academic institutions, primarily because of a lack of mapping to individual institutional curriculum. Further these courses are generally monolithic packages, which are not easily amenable to disaggregation to suit faculty specific courseware requirements.

c. **Common Computing Resources:** The Computational Commons Project makes available extensive computing resources and software used for modeling and data analysis on an as-needed basis to faculty teaching courses, students doing independent research or study, and to research groups where provision of local computational resources is impractical. The primary deliverables of this project are the software to facilitate the dynamic loading of computing resources, example research software that uses these computing resources and the general dissemination of and access to the software and the computing resources. This project when coupled with the now available power of 'Cloud Computing' makes hitherto unattainable didactic learning experiences now within the reach of any institution within the world with the learning and network infrastructure capable of tapping into this resource.

### B. Learning Services:

Incorporating external learning resources especially 'Open Courseware' and computing resources into an institution's learning methods requires carefully planning leading to the formation of a well thought through learning design, leading to a map of the resources to the specific curriculum being followed and most importantly training and getting buy-in from the stakeholders involved in the learning process – the faculty and students. These aspects are discussed in more detail below:

- a. **Learning Design:** Changes and challenges faced by faculty in adopting 'Open courseware' include that
  - There is now more emphasis on the 'teaching process' rather than the aspect of being a 'Subject Matter Expert'.

- The teaching process in itself morphs into a more facilitative role.  
As a corollary, inter-student interactions become vital to the learning process.
- The role of technology in enabling learning becomes prominent; leading to the need of a well designed Learning Technology infrastructure.

Institutions adopting open courseware must take note of the above parameters while revisiting their learning design.

b. **Map to Curriculum:** Using 'Open' resources to meet curricular needs have to navigate the problem of plenty and of relevance. There are hundreds of institutions putting out thousands of courses for use; for an adopting institution however what they need is 'One' course that addresses their curriculum for that subject. It therefore becomes an important service function to map the list of available courses to the curriculum of the adopting institution and choose specific courses or portions of courses that fit. A good mapping strategy as an ongoing process can be a great strategic advantage to the adopting institution; since the list of available 'Open' courses is ever growing the adopting institution can therefore potentially refresh its courseware on a relatively frequent basis so that it takes advantage of the latest that is available on the subject at little cost.

c. **Training Stakeholders:** Use of 'Open' courseware means is a paradigm shift. It's a change in the way courses are Created, Taught and Learnt. Further it generally also imposes a greater use of technology in the learning process. Hence there needs to a concerted 'Change Management' plan to get buy-in and train Faculty and Students. This is going to be critical in order to drive adoption and ensure success.

### **C. Learning Infrastructure:**

The underpinning of this 'Open Learning Framework' is technology. With the right Learning infrastructure framework academic institutions will be able to leverage 'Open' learning resources, foster greater student interaction and usher in a higher quality of learning experience. However, the current state of technology in education is rife with challenges. Siloed enterprise applications, Lack of data interoperability, High software licensing fees, Escalating total cost of ownership, all contribute to inefficient processes, creating barriers to collaboration and innovation.

The Learning Infrastructure framework proposed, envisages relying on Open standards, open source applications and an open architecture that can deliver a common framework that spurs innovation, increases interoperability and flexibility, improves service delivery and drives down total cost of ownership. The framework has the LMS linked to a variety of learning tools via OSID's.

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