Large Class Implementation using LAMS in NTU

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Coverage

• Past/Current TEL Courses in NTU using LAMS
  • Philosophy and Approaches
  • Current Numbers (Front and Back End)

• Feedback and Statistics from Key Courses

• Large Course Implementations
  • Key considerations
  • Learning Moments

• Future Plans
Past/Current TEL Courses using LAMS in NTU

- Before 2012:
  - Faculty DIY effort and asking for advice on ad-hoc basis
  - About 200+ courses with at least 1 LAMS sequence
  - Most will have 1-2 LAMS sequence as part of total eContent in LMS and mostly for eLearning week period.
  - Breadth but not much depth

<table>
<thead>
<tr>
<th>No of unique edveNTUre course-sites with LAMS Sequences (Academic Courses only)</th>
<th>AY12/13</th>
<th>AY11/12</th>
<th>AY10/11</th>
<th>AY09/10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>270</td>
<td>86</td>
<td>48</td>
<td>97</td>
</tr>
<tr>
<td>YOY Increase for Academic Courses</td>
<td>210%</td>
<td>79%</td>
<td>-50%</td>
<td>NA</td>
</tr>
</tbody>
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Past/Current TEL Courses using LAMS in NTU

- After 2012:
  - A much more concerted Implementation - Aligned with NTU Education Initiative
  - Learning Solutions Section in CITS project manage and develop TEL courses end-to-end with Faculty
  - Annually, **30 courses of at least 900 hours** of courses committed.
  - Comprehensive, holistic learning design that ensures at least 7-13 LAMS sequences per course
  - Deeper design and in the **next 5 years, more than 1500 courses, with more than 45000 hours of content**.
    (Over 60 courses internally per year, with about 100-200 outsourced, per year)
Philosophy and Approaches
Traditional Classroom:

TIME

homework from the previous class

first exposure via lecture

deeper understanding via homework

CLASS

Flipped Classroom:

TIME

first exposure via videos or readings

deeper learning via activities

some homework still + prep for the next class

CLASS

Source: Coursera.org; https://class.coursera.org/mooc/wiki/view?page=FlippedLectures
Flipped Classroom

- Classroom Flip uses
- Educational Technology influences
- Learning Through Activity provides opportunity for
- The Learning Environment influences

Source: Jeremy F. Strayer, Ohio State University
Teacher Didactic Communicator Knowledge transfer

Content Textbook Courseware

Learner Receptor

Teacher Didactic Communicator Knowledge transfer

Current/Previous Mode of Classroom Interactions
Emerging Model

- Participative
- Collaborative
NTU Online Learning Framework

Interface Layer: i-NTULearn. One-Stop Entry to all Learning Tools

Learning Design is key element

- Video lessons
- LAMS Interactive Module
- Learning Activities
- i-NTULearn iLecture
- Collaborative annotations
- Multimodal ebook content
- Collaborative activities
- Reflective activities
- PinP and Flipped
- Synchronised with PPT
- Synchronous Session via Accuconference etc.
- In-situ user created content

LMS

Closing the loop via Analytics that gives data on usage/effectiveness and for learning diagnosis and intervention etc.

Learning Design is key element.
Key Learning Tools\Platform

- NTULearn
- LAMS
- iNgage

- Mobile Platform
- Offline viewing
- Annotation
Current Numbers (Up to Now)

Front End

- From at least 15 different courses: (More than 500 enrollment)
  - Blended learning courses the Part-Time B.Eng. Degree Programme: MAE and EEE currently (SCE in the future)
  - Renaissance Engineering Programme
  - Full-Time Blended Engineering Courses from EEE and NBS
Current Numbers (Up to Now)

Front End

- Recently ran Large Class Courses: (Total: More than 3000 enrollment)
- Core Course on Sustainability (More than 1700 learners)
- Core Course on Career Basics (More than 1000 learners)
- Full-Time MAE course converted from the Part-Time Course (More than 500 learners)

Increase of more than 50% in enrollment numbers and will continue to increase with 3 more Core Courses and Bridging Courses from Jan 2015, adding at least another 3000 learners
Numbers (Up to Now)

Back End

- Current LAMS setup: 4 server + 1 app server + 1 DB server + Load balancer
- Established workflow between LAMS Front end + Backend + LAMS International
- Contractual agreement between NTU and LAMS – 100 service hours
- Current capabilities – can handle up to 600 concurrent connections (10% of total 6000 learners)
Key Statistics:

<table>
<thead>
<tr>
<th>Courses</th>
<th>Completion rate*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part Time Module 1</td>
<td>71%</td>
</tr>
<tr>
<td>Part Time Module 2</td>
<td>80%</td>
</tr>
<tr>
<td>Part Time Module 3</td>
<td>57%</td>
</tr>
<tr>
<td>Part Time Module 4</td>
<td>35%</td>
</tr>
<tr>
<td>Full Time REP Module 1</td>
<td>89%</td>
</tr>
<tr>
<td>Full Time REP Module 2</td>
<td>92%</td>
</tr>
<tr>
<td>Full Time REP Module 3</td>
<td>83%</td>
</tr>
</tbody>
</table>

*Completion rate here is akin to finding out what percentage of students who attended lectures, actually completed listening to the lecture, go through the thinking process and did not walk out a quarter of the way, halfway or any parts thereafter.
## Specific areas of learners experience

<table>
<thead>
<tr>
<th>Statement</th>
<th>Percentage of respondents agree to the statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>The LAMS modules were easy to access through the LMS</td>
<td>75%</td>
</tr>
<tr>
<td>I felt I had enough support to learn to use the LAMS interface</td>
<td>70%</td>
</tr>
<tr>
<td>While working through the LAMS modules, the navigation was easy and the instructions were clear</td>
<td>70%</td>
</tr>
<tr>
<td>This course provided a flexible learning environment</td>
<td>75%</td>
</tr>
<tr>
<td>The lecture recordings were clear and loaded smoothly</td>
<td>70%</td>
</tr>
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</table>
Feedback:
Kudos and Reinforcements

- "It allows me to control when I feel like learning, making it easy for me to learn as I am able to choose to learn in my optimal mode. It also enables me to engage in questions immediately after a lecture instead of having to finish the worksheets at home in reality. This makes us remember the content better as it reinforces the stuff twice in one go, so its much effective compared to doing the worksheets after reaching home."

- "Online learning allows me to better understand the topics covered as I can easily return back to the previous module to refresh my knowledge and to think about questions raised in the other modules. It is also flexible as I can plan my time well to cope with the online learning as well as my other subjects."
Feedback: Kudos and Reinforcements

“I liked the idea of **sharing my comment and thoughts** with my fellow course mate and at the same time **looking at their thoughts**. This allows me to have **diverse understanding of the topics discussed**.”

“Through this way, we can listen to the teacher's class more carefully, as we can **choose** to listen as many times as possible.”

“I like that the videos are short and direct to the points, with **reflecting questions** that allow me to **recall** what I have learnt.”

“Having it done completely online means that I can complete a week's worth of lectures **in less half the time** due to no time being wasted travelling or lecturers wasting time by starting late.”

“While LAMS may allow us to have more flexible schedules, **it may also need more willpower and discipline on our part to ensure that we watch the lectures weekly.”**
Feedback:
Improvements and Suggestions

- “Although online learning allows me to learn at my own pace, I would still prefer traditional classroom learning as it allows for more interaction and sharing between the students and the lecturer/tutor.”

- “It would be more interesting if there is a session where students can come together for an online “tutorial group” to share their opinions with everyone.”

- “Also, the inability to adjust the playback speed is very frustrating as many of us often watch the recorded lectures at faster speeds.”
Feedback:
Improvements and Suggestions

- “Also, this effectively increased the amount of time we need to spend on this topic to 5 hours + per week up from 2 hours (for lectures). **Perhaps, longer tutorials instead of lectures would be more effective when paired with LAMS, and each tutorial can start with a quick review of the chapter as you have suggested.**”

- **Lecturers sound unnatural during LAMS recordings** and it is noticeable by students, because speaking to a screen and speaking to a lecture theatre is vastly different.
Large Class Implementation: Between 1000-6000 enrollment

- Core Course on Sustainability - Started in Aug 2014
- Core Course on Career Basics - Started in Aug 2014
- Core Course on Entrepreneurship - Starting in Jan 2015
- Core Course on Ethics - Starting in Jan 2015
- Core Course on Engineering Communication - Starting in March 2015
- Bridging Course for Physics - Starting in April 2015
Large Class Implementation: Key Considerations

- In lieu of many Faculty/SME being involved, the authoring tool must be easy to use and flexible:
  - Support of various pedagogical strategies – branching of activities, POE, Problem based etc
  - Ease of use for faculty developing the course
  - Workflow and processes established – Customized ADDIE process
- Ease of use for students
  - Orientation briefing
  - Lams introduction guide and video
Large Class Implementation: Key Considerations

- Readily available front end and back end support
- LAMS Ticket through the service desk gets routed correctly and accurately
- Dedicated backend support team
- Fast support from LAMS International

- Ease of monitoring by faculty
  - LAMS monitor
  - Diagnosis and Learning Intervention
  - Status of Learners
  - Export of Learning Portfolio

- Recyclability of content
- LAMS Templates
Large Class Implementation: Learning Moments

- Scalability and Stability - load testing and stress test (RAS)
  - Load Testing was done for 600 concurrent users
  - Business logic for specific LAMS sequence must be tested too
  - Q&A issue for Core Course

- Adoption by faculty
  - Facilitation Strategies during the face to face sessions are important
  - Linking online and offline activities are key
  - Mindset change - bad teaching practice brought along to any learning tool will result in similar things
Large Class Implementation: Learning Moments

- Students’ Load
  - Manage expectations of students re what's expected when going through the LAMS sequence
  - Majority are ok but some will question the different way they need to learn now
  - Students must see the value and belief from Faculty too.

- More Flexibility in terms of other tools integrated into LAMS
  - Such as video streaming playback capability and download
Future Plans: The NTU 5-Year Roadmap

- NTU’s 5 year roadmap (Learning Environment plans)
  - 1500 courses over 5 years: 60 courses in house and remaining outsource per year.
  - NTU LE seamless integration with LAMS and other tools
  - More DIY wizards and self-help guide within a user-centric eco-system:
    - i-NTULearn

- LAMS Merger exercise (NTU, LKC, REP)
  - Merging all LAMS instances into one instance for consistency and also scalability

- LAMS templates on current Interface Layer
  - More than 10 different templates which Faculty can make use of
  - Interface Layer version 1.0
Thank U

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