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Open Homework Systems

Math Articulation Meeting

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Clint Lalonde, Project Manager, BCcampus

Shirin Boroushaki, Math Department, TRU



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Agenda

Open Homework Systems project
Comparative analysis of platforms
Discussion: Your experience
Potential next steps



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What are homework systems?

Homework Systems are a class of education technology that supports student practice, self-reflection, and self-assessment in order to reinforce concepts they have learned in class.

Homework Systems may also be known as **adaptive learning platforms, personalized learning platforms, or digital tutoring systems**, and may contain interactive elements, self-quizzes, prompts for student reflection, simulations, and offer hints and suggestions.



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Pedagogy of Practice: The Doer Effect

The “doer effect” is an association between the number of online interactive practice activities students’ do and their learning outcomes.

We also provide generalizability evidence across *four different courses involving over 12,500 students* that the learning effect of doing is about ***six times greater*** than that of reading.



The Problem

Subject	Resource	Cost	Publisher	Tool
Accounting	Horngren's Accounting, Vol 1 & 2 W. Mylab Accounting/Etext, 11Th	\$209.95	Pearson	MyLab Accounting
Accounting	Auditing: A Practical Approach, 3Rd Cdn Ed./ Loose-Leaf + Wileyplus	\$164.95	Wiley	WileyPlus
Automotive	Intro To The Control Logix Programmable Automation With Labs	\$133.50	Nelson	NelsonBrain
Business	Mgmt, 3Rd Ed With Mindtap Access Card	\$104.95	Cengage	Mindtap
Communications	Interactions Level 2 Listening An Speaking Student Book W/ Connect	\$87.50	McGraw Hill	Connect
Communications	Business Communication Essentials Custom, 6Th Ed W. Mylab Bus Comm Nd Code	\$119.95	Pearson	MyLab
Computers	Database Systems: Design, Implementation, & Mgmt, 13Th Ed	\$181.95	Cengage	Mindtap
Computers	Exploring Microsoft Office 2016 Vol 1	\$194.50	Pearson	MyITLab
Math/Computers	Discrete Mathematics W/Appl	\$234.95	Cengage	Mindtap
Computers	Exploring Microsoft Excel 2016 Comprehensive	\$145.95	Pearson	MyITLab



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What are open homework systems?

An Open Homework System is a Homework System that is released with an open source license that allows anyone to host their own instance of the system, and to modify and/or reuse the application with no software licensing fees.

Open Homework Systems should also provide technical capabilities within it to support **open educational practices**, through the incorporation of open educational resources, open licenses, and collaborative features that provide instructors the ability to collaboratively create and share problem sets with each other.



OHS Goals and Deliverables

1. Replace high use, high cost commercial homework systems used within the BC post-secondary system with open source alternatives.
2. Develop discipline champions and communities who can further steward the open source options once the project ends
3. Inform and educate system about financial costs of homework systems on students.

An open homework software system **or systems** that can be used to replace commercial publishers systems.



Strategic Considerations

Commitment to open source and OER

Focus on leveraging existing systems

Focus on high enrollment courses/subject areas

One platform not be enough
Multiple platforms too many

Research to inform decisions

Collaborative content creation

Open digital courseware as destination

Leverage existing open work in the province

Data collection and data analytics: FIPPA and beyond



Different Areas Different Needs

STEM



IMathAS



Non-STEM





Phase 1 Initiatives

Initiative	Description
Commercial Usage Research	<p>Market research project is intended to examine actual usage patterns of commercial systems within the BC post-secondary system.</p> <ul style="list-style-type: none">• A list of the top 10 digital courseware products in use within the BC post-secondary system and their publishers.• The retail cost that a student could expect to pay to use the system.• The enrollment number of students within the BC system who are required to use the system as part of their course.• The subject area of the course where the courseware is used.
Open Textbook analysis	<p>An analysis of existing open textbooks within the BCcampus collection to determine which books could benefit from the inclusion of homework-like interactive activities.</p>
H5P OER Development Grants	<p>Award 5 OER development grants of up to \$10k each to develop H5P assessments aligned with existing open textbooks.</p>
Comparative Review STEM options	<p>A comparative evaluation of the leading open source STEM systems with a focus on features, usability (specifically around the faculty experience), accessibility, interoperability, and sustainability (business or funding model, community structure, development community etc.)</p>



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Comparative Analysis WeBWorK, IMathAS, Numbas



Additional Considerations

	WeBWork	IMathAS	Numbas
Robust developer community	Green	Red	Red
Project Governance	Green	Yellow	Yellow
Accessibility	Green	Yellow	Yellow
Documentation	Green	Yellow	Red
Sizeable user base	Green	Yellow	Red
Scalable infrastructure	Yellow	MyOpenMath	Yellow
Open problem library	Green	Green	Red
Additional LMS-like features	Red	Green	Red
LMS integration	Green	Green	Green



Your Experiences



Are you using homework platforms?



Have you used WeBWork at your institution?



What has been your experience with WeBWork



What are the barriers to using it?



Have you run into resistance from IT services to install your own instance of WeBWork? If so, what has been their rationale?



Discussion: Two Potential Models

Centralized Shared Service

BCcampus applies one time funding of up to \$150k to establish a centralized shared service model (Kaltura Model)

- Estimated cost: \$150k-\$200k annually for FIPPA compliant cloud-based service supporting up to 2000 concurrent users.
- UBC as technical host, BCNET as financial administrator.
- TBD governance, support & sustainability costing models.

Decentralized Institutional Hosting

BCcampus applies one-time start-up grants to individual institutions to set-up & maintain their own instances of WeBWork.

- \$150k total could be 6 grants of \$25k
- Develop criteria for equitable distribution



Constraints & Issues

- Cost cannot be directly borne by students
- Needs to be operationally sustainable (shared service)
- Support model (Instructors, Students, IT)
- Governance model (shared service)
- Funding model (shared service)
- Administrative issues (shared service)
- Technology issues (share service)



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Your Possible Role

- Stakeholders
- Advise & collaborate
- Disseminate information institutionally
- Connect
- Potential early adopters



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Thank You

Clint Lalonde Project Manager

clalonde@bccampus.ca

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