**Barriers and enablers for faculty use of new technology
to support teaching and learning**

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Overview:
To provide a framework of discussion for this discussion paper, we employed Rogers Five
Factors (Rogers 1995) for affecting, adopting, and accepting new technology. This model is
extensively employed in business contexts to examine reasons for failures and successes, with a
focus on the consumer/user and the benefits offered to them. Previous studies on
postsecondary institution adoption of technology (e.g. Surry et al 2005) have also used this
model. While our responses are mainly centered on the adoption of Canvas across campus, this
framework is generalizable to other learning technologies.

Rogers Five Factors are:
1. Relative advantage – How much better at your job will you be if you adopt this?
2. Compatibility – How compatible is the technology with what you are currently using?
3. Complexity – How difficult is the technology to understand and use?
4. Trialability – How easy is it to try the product?
5. Observability – Are you able to observe others using the product?

For each of these five factors, we reflected on the barriers and enablers that each of us and our
colleagues have experienced in our use of learning technology.

Summary:
Most of the barriers and enablers could be categorized as issues of relative advantage, which is not surprising, given the workload issues and competing interests that faculty encounter. This was also the most 'diffuse' category and didn't receive as much attention from structured activities and resources like workshops or Technology Rovers. Compatibility was similar in that there were less specific barriers and enablers to address these issues.

Complexity, trialability, and observability factors received direct attention in the transition from Connect to Canvas via targeted resources. Help webpages, discussion forums, concierge-service help, and Learning Technology Rovers all contributed to the communication of relative advantages and compatibility of the system.

Overall, while university-level resources can address most of these factors, strong messaging through peer interactions, examples on the relative advantages of adoption, and incentivizing adoption through better work product appeared to be most effective strategies.

1. Relative advantage – How much better are you after adoption of technology?

Barriers
- *Bad previous experience, so "never again"*
  Many colleagues reflected that there have been many different online learning systems (OLS), and that the last transition was very difficult. This left many people with a poor impression of OLS in general.
- *"Wait and see" attitude*
  For some, the adoption of a new system that may not work is a high risk, with potentially no perceived advantage. This was particularly true for faculty who had a heavy teaching load (e.g. 3 courses) in the first term of implementation.
- *Replicating Connect?*
  For colleagues who perceived the change as merely replicating what they currently provided in Connect, there was no relative advantage to adopting the new system. This may have been particularly so for faculty who do not currently employ many OLS tools (e.g. just posting grades and/or PowerPoint presentations).
- *Timing of cost (2) and benefit (1) = effective*
  Ideally, the benefits of a new system should be felt prior to the cost that is incurred with the use of a new technology. Where costs are 'paid' up front (e.g. heavy investment into setting up a tool) and later on, the benefits are felt, there is a less effective adoption.

Enablers
- *"ABC" - anything but Connect - Why continue to use something this is broken?*
  Messaging around a particular tool can be effective if the prospective user is reminded of the dissatisfactions with the current system. This can also speak to the timing of benefits and costs for the user – if there is an immediate benefit from using an educational tool, there is greater buy-in.
- *Enabling the use of better online pedagogy and tools that are more engaging*
  New technology allows teachers and learners to engage with each other and with content in a way that is supported by current understanding of best practices – because of the built-in tools and functionality, and the flexibility to incorporate external tools (e.g. Piazza, iClicker, and EdX).
  Faculty who engage with new technology like Canvas were able to provide better online grades reporting, and were able to focus on features that would make a large difference to student learning.
- *Increase in student engagement*
  Instructors will be motivated to adopt a new learning technology if it enhances student engagement. For example, the use of clicker questions during lecture enables students to actively engage in the learning process and receive timely feedback on their understanding of the course material. As well, instructors will be more likely to adopt a learning technology if they hear positive user experience from their colleagues.
  Simpler access to course resources and activities via mobile devices provides both instructors and students with possibilities for increased interaction both inside and outside the classroom.

- *More efficient use of time*
  With new technology (i.e. Canvas), courses are faster to set up and can be cloned from existing courses, or set up as trial courses (i.e. "sandboxes") well in advance. Grading processes are more efficient, allowing direct grading online by TAs or instructors.
- *Adoption vs adoption with satisfaction*
  Users who are asked to engage with new technology will evaluate whether or not they are just adopting or will be adopting a new system with greater satisfaction attached to it. This assessment is related to the above points as well.

2. Compatibility – with existing behaviors and values

Barriers
- *Instructors have to learn (yet another) online learning system*
  If the new technology requires additional training (e.g. different enough from the old system), the investment of time and energy becomes less efficient. Colleagues had the misconception that the new system was not compatible with some key teaching tools (e.g. iClickers) that are used in many larger classes and declined to adopt of Canvas in the first term it was offered.
  Previous online learning systems had highly customizable features (e.g. menu options) that instructors liked to modify for their online approaches. Lack of customization was seen as being a strongly negative aspect, despite the tradeoffs that exist between customization and functionality.
- *Students have to learn (yet another) online learning system*
  This issue has a significant impact on students, as they are required to use different tools with different instructors and therefore need to learn how to use a variety of systems.
  Variations in adoption of new technology between programs, faculties, or instructors led to the perception that some have a less progressive approach to teaching.

Enablers
- *Use CWL (same interface), same provision of courses*
  Users can use CWL to access different learning technologies supported by UBC, such as Workspace, Qualtrics, Canvas, etc. For example, on Canvas, users who teach multiple courses can use CWL to access all courses on the same platform. Blueprint or Commons in Canvas facilitated users who teach different sections of the same course.
- *Easy upload and display of different file types*
  Different file types are compatible with Canvas, including different types of audio/visual materials, enabling a wide range of disciplines to adopt.
- *Using learning technology is an important and valued teaching practice*
  UBC Faculties are encouraged to create and refine learning opportunities, activities and experiences for students. Using learning technology is just one such attempt.
- *Easy accessibility of learning analytics*
  Learning technology has made it easier to collect student learning analytics data and has made using and sharing of such data easier. Use of learning analytics to inform course and program review and reflective practice provide better evidence for the use of resources by students and mapping student success.

**3.	Complexity – How difficult is it to understand and use the technology?**

Barriers
- *Time to explore, don't force me to do this in a short timeframe!*
  Where users want to explore the use of a new tool in an environment without any risk of failure, a short timeframe may not allow for a lot of time for training, trialing, and other things. Particularly with complex tools, there may be an additional need for time.
- *Deal breakers in the design*
  Unlike the previous online learning system, the use of a 'Publish' button in Canvas was a new process, though not complex. This one new item was a 'deal breaker' in that it created a complete fail for instructors if they didn't remember to push that button.

Enablers
- *Gentle learning curve*
  Compatibility with everyday computer use (e.g. drag and drop movement of files), as well as a simple layout and design (clean interface) led to the widespread experience of Canvas as an easy-to-use system that is logically laid out. The relatively seamless import of files from the previous system allowed instructors who already were using the system to use what they already had in place.
- *Leadership from others*
  Instructors are getting one-on-one, on-demand help from early adopters / champions, Canvas Tech Rovers, LT Hub as well as online Canvas resources and the Canvas Help Desk.

**4.	Trialability – Is it possible to use the product ahead of time to test it out?**

Barriers
- *Timing of trials*
  The testable connection for Canvas and Brightspace was only made available mid-term (e.g. February 2017), which is an unlikely time for faculty who might want to test out new systems. It should be noted that the mid-term option also allowed for the import of currently-running courses into the new system, for a more realistic view of the capabilities (enabler).
- *Opportunity costs to the user*
  Trialing and adoption of new technology bears opportunity costs to faculty in the loss of time spent on other, more direct benefits.

Enablers
- *Low-risk environment for learning available in advance*
  The availability of sandboxes for interested faculty and staff to use in advance provided two resources: a low-stakes learning environment for those who will come to rely on the new technology and a credible testing of the resources that can be reported to others.

- *Champions to lead the way*
  With access to sandboxes, faculty were able to test out functionality of the system in a manner pertinent to teaching practices in their discipline, and were then able to speak with authenticity to the capabilities of the new system.
- *Full "concierge" support*
  During the trial period, faculty members were offered higher-level support with full-time, one-on-one help on demand. Where peer help and advice would be unlikely owing to the small number of people participating, this provided an excellent resource.

5. Observability – Is it possible to observe others using the product?

Barriers
- *Very low observability of efforts between faculty members*
  No initial template was available to faculty members and 'built-out' courses weren't available for touring or example. Sharing between courses isn't required or facilitated in many Faculties. Use of the Canvas Commons is not widespread, leading to little lateral transmission of information. There is not always a culture of sharing educational materials, and experiences between individual faculty members. Centralized information was not always available on who in a department is using Canvas, or what features they use in Canvas, so peers wouldn't necessarily know who to ask or talk to about issues.

Enablers
- *Peer leadership*
  Early adopters of the technology can interact with peers in departmental or faculty meetings, but hands-on one-to-one learning seems to work the best for many.
- *Workshops to learn the technology and demo function*
  Formal workshops allow for direct interactions with Canvas experts and allow faculty to interact with peers from outside their usual departmental colleagues.
  Workshops may also help with barriers to sharing information within faculties, as those attending can see who else is using the resource.
- *Co-teaching model; may be barrier or benefit*
  In courses that are co-taught by a team of instructors, instructors can observe how others who have prior experience on using a learning technology, and hence will more likely to adopt it in future iteration of the course. However, there is a risk that instructors will have no prior experience may leave the experts to be fully in charge and not engage in the implementation of the technology (this will be a barrier).

Next Steps – Short Term:

As we move into the summer months and anticipate the largest number of courses migrating to Canvas and other technologies, several strategies can be used to assist instructors in the transition.

1. One-on-one help in the form of Technology Rovers, phone-in service, and peer assistance (e.g. faculty champions) appears to be the most popular resource and can be expanded in the most meaningful work period for faculty members who are migrating in September. Bolstering this level of support help with all five aspects of Rogers Factors, including the qualities of relative advantage. Selection of the most meaningful work period will be a challenge and will require additional faculty consultation.

2. Early, accurate messaging regarding the compatibility of the technology with current practice and use may be able to dispel concerns and misconceptions for instructors.

3. Workshops that are more tailored to discipline-specific practice may help with faculty champions, messaging, and more personalized service, as the use of specialized third party tools seems to be partly determined by Faculties and Departments.

Next Steps – Long Term:

In the broader context of technology adoption for the future, examination of the migration to Canvas provides some helpful insight.

1. Two-stage adoption (e.g. optional then required stages) allows for the development of informal resources (e.g. institutional knowledge, positive messaging, faculty champions) that effectively addresses issues of relative advantage.

2. Adoption of technology for the sake of technology does not communicate relative advantages well to faculty members, even if compatibility, complexity, trialability, and observability are addressed. This should be a strong primary consideration for further learning technology adoptions in the future.

3. Incentivizing high-quality teaching practice prioritizes improved and updated teaching methods for faculty and may help institutionally to communicate relative advantages.

References cited:

Rogers, E.M. 1995. Diffusion of Innovations. The Free Press, New York.

Surry, D.W., D.C. Ensminger, M. Haab. 2005. A model for integrating instructional technology into higher education. British Journal of Educational Technology 36(2): 327 – 329.