

Spring 2017 Report

Education Working Group, Engineering IT Governance Committee

College of Engineering, University of Illinois at Urbana-Champaign

July 14, 2017

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Executive Summary

Significant progress has been made since the first Education Working Group (EWG) in 2013, with improvements in educational IT service reliability and availability, as well as in communications and facilitation staff in EngrIT. Education is becoming increasingly reliant on technology, especially as we scale up to a larger numbers of students and move towards online models, making it crucial that Engineering at Illinois has access to appropriate educational IT resources. As detailed in the “Assessment of IT Support for Education” section below, there are many areas that require attention to ensure a high standard of excellence.

Charge

The charge letter (see Appendix 1) from the Associate Dean for Information Technology on states:

This working group is critical to helping ensure that IT support of the educational needs of instructors, and students in the College is of the highest quality and reliability. Your

recommendations and comments are advisory to the Associate Dean for Information Technology, with primary responsibilities for:

- Reviewing policies concerning the sustainability and provision of any needed education IT that enhances the College education mission, both at the Engineering College level and at the campus-level.
- Considering IT support for new education pursuits in our College, anticipating new opportunities and responding to interests and initiatives from our units.
- Monitoring, assisting with prioritizing, and providing feedback on the implementation of any proposals concerning education IT.
- Assisting with monitoring, providing feedback, and reporting on the progress of work to align Engineering IT services with campus-level IT services, in particular with respect to education.
- Coordinating and communicating with the other IT working groups with overlapping interests.

You will also be asked to provide an assessment at the end of the academic year on the current state of IT support for education activities.

Background

The Education Working Group 2016-2017 is a part of a governance structure for Engineering IT that is comprised of three working groups:

1. This group (Education Working Group for IT),
2. A Research Working Group for IT, chaired by Daniel Bodony, and
3. An Administrative Working Group for IT, chaired by Kristopher Williams.

The activities of the three working groups are coordinated by an Engineering IT Governance Executive Advisory Committee chaired by the Associate Dean for Engineering IT (Prof. Roy Campbell) and having as members the three working group chairs, the Director of Engineering IT (Jim Hurst), and the Assistant Director of Outreach and Engagement for Engineering IT (Kim Nguyen-Jahiel).

The 2016-2017 Education Working Group is the fourth yearly iteration of the Education Working Group. This report follows on from the Spring 2016, Spring 2015, and Spring 2014 Reports of the previous Education Working Groups. These previous reports made a number of recommendations for improving Engineering IT support for education in the short term and long term.

Working Group Activities

The 2016-2017 Education Working Group met 13 times over the 2016-2017 academic year, 7 times in Fall 2016 and 6 times in Spring 2017. Specific activities include:

- 10/21/2016: Brad Mahaffey (Assistant Director for Instructional Services) presented to the working group on the current state of instructional IT in the college. The presentation is included as Appendix 4 in this report.
- 11/16/2016: The Education Working Group met together with the Research and Administration Working Groups for an “All Governance” meeting, at which Engineering IT staff gave presentations about current initiatives and all participants engaged in planning exercises.
- 12/2/2016: Prof. Harry Dankowicz (Associate Dean of Graduate, Online, and Professional Programs) and Frank Hoskinson (Director of Online and Professional Engineering Programs) met with the Education Working Group to discuss common interests, including blended online/offline learning, A/V and recording systems in the college, and strategies for online assessment.
- 3/3/2017: The Education Working Group reviewed a proposal from the Research Working Group for establishing a college training resource run by CSE (Computational Science and Engineering). General support was expressed by the EWG, with some concerns about whether CSE was currently well-placed to coordinate this.
- 4/14/2017: Brad Mahaffey (Assistant Director for Instructional Services) and Kim Nguyen-Jahiel (Assistant Director for Outreach and Engagement) presented to the working group on the state of the current Echo360 lecture capture system in the college and the alternatives going forward. The best current option seems to be the new cloud-based offering from Echo360.
- May 2017: The working group conducted a review of the Computer-Based Testing Facility (CBTF), including a survey of faculty in the college who have taught using the CBTF. The resulting report is included as Appendix 2.
- May 2017: Led by Kim Nguyen-Jahiel, the working group conducted a survey of all College of Engineering students to better understand their current device ownership and opinions of IT support. The results of this survey are included as Appendix 3 and should guide future Education Working Groups, specifically in considering whether the college should establish a “laptop requirement” for all students.

Assessment of IT Support for Education

The Education Working Group is specifically charged to provide an assessment of the current state of IT support for education activities. As part of this activity the working group reviewed the previous working group reports from Spring 2014, 2015 and 2016. The 2016-2017 Education Working Group endorses all findings of the previous Working Group reports, and makes the following assessment of IT support for education. The assessment findings have been grouped into three subsections: (1) those without direct recommendations, (2) those with recommendations that should be implemented as soon as possible (“short term”), and (3) those that should be implemented within a 6 to 18 month timeframe (“long term”). The classification into short and long term does not imply anything about the importance of the findings.

General findings without recommendations

1. There have been very substantial improvements in the college education IT infrastructure availability and reliability over the past four years. The current computing resource reliability is good, and serves both students and faculty well. Engineering IT should be commended for improvements in this area.
2. The new monitoring and status capabilities that have been created are highly functional, especially the <https://status.engineering.illinois.edu> service status page. Real-time and historical access to status data is of great use to both students and faculty when interacting with IT.
3. The Instructional Technology Facilitator (ITF) role that was created in 2015 has been very successful in fostering access of faculty to educational IT resources. The current ITF (Dave Mussulman) has been outstanding in this role and should be highly commended for his efforts.
4. The Assistant Directors for Outreach and Engagement (Kim Nguyen-Jahiel) and for Instructional Services (Brad Mahaffey) have been very helpful to the Education Working Group in understanding the state of educational IT in the college and in formulating assessments and recommendations.

Findings with short-term recommendations

5. As previous EWG reports have highlighted, communication between campus IT organizations and faculty continues to need improvement. In 2016-2017 there were several major changes to IT infrastructure or policies that were not communicated in advance to faculty, causing unnecessary stress. Examples include the rollout of CentOS 7 to the EWS labs in Fall 2016, the removal of the student site license for MATLAB in 2016, and the removal of the free printing quota for students in Spring 2017. **A better communication strategy should be adopted to make sure that faculty have advance warning of IT changes that will impact courses.**
6. Training resources are required for students and faculty to use computational resources, including specific tools (e.g., MATLAB, R, CFD, FEM), data analysis, version control, data management, video production, and website creation. **EWG supports the plan from RWG to have CSE serve as a coordinator of such training, and encourages CSE and/or EngrIT to curate online training resources.**
7. The CBTF (Computer-Based Testing Facility) has been very successful in supporting exams for large courses and enabling computer-based exams. Proctor excellence must be maintained, perhaps by shifting responsibility for proctors to another organization with the college (e.g., undergraduate programs office). **More resources should be allocated**

to developing new CBTF capabilities, including BYOD support, remote testing, and live code grading, and there should be additional support for assisting new courses and faculty to start with the CBTF (perhaps via SIIP).

8. The EngrIT App Dev group remains almost exclusively focused on administrative apps, with essentially no resources going towards support for education. **The App Dev supervisory committee should be restructured to include a substantial number of faculty from EWG (and possible RWG)** to address this imbalance. The reliance of the App Dev group on closed-source Microsoft tools is an additional barrier to interoperability with faculty experimenting with new approaches and **EngrIT should develop open-source development capabilities**. EWG considered one current education app (the "my classes" module in my.engr) and concluded that it was not widely used and did not meet the needs of faculty.
9. The CATME team formation and assessment service used by multiple engineering courses is moving to a paid model in Summer 2016. **The CATME service should either be licensed or equivalent functionality should be available.**
10. **The college should initiate a pilot effort on unified assessment and data analytics.** There is a need for easy access to both centralized educational data (e.g., course grades, other Banner data) and localized data (e.g., within-course assignment scores), as well as to the ability to connect data across courses.
11. **Access to HPC resources and computer clusters for education must be maintained, especially with the retirement of the Taub nodes.**

Findings with long-term recommendations

12. Some IT efforts to enable access to cloud solutions have been very successful. Good examples include Box, Google Apps, and Amazon Web Services. **More efforts to make cloud solutions widely and transparently available (single sign on) on campus should be pursued**, for example for backups (e.g., CrashPlan or Backblaze) and other cloud computing platforms (Azure and Google Cloud Platform).
13. There remains a substantial unmet need for IT support of educational innovation. The EWG report from last year recommended the formation of Rapid Services Development Team (RSDT) within EngrIT to support such activities, but this was unsuccessful and has been discontinued. Last year's report also recommended closer connections between EngrIT and SIIP projects, which has not yet occurred in a systematic way. **The college should work to enable IT support for education innovation, either within EngrIT or outside of it.** There are significant barriers to innovative development activities within a production-focused environment such as EngrIT, so that it may be more effective to base innovation-focused staff in a separate group or to have some innovation staff located within departments.

14. The current college A/V systems in classrooms and systems for lecture capture are in need of software upgrades. The current plan of migrating to the new cloud-based Echo360 offering seems sensible in the short term, but **EngrIT should continue to explore other A/V alternatives in the three to five year timeframe**, especially integration with open campus-wide solutions based on Kaltura (mediaspace.illinois.edu).
15. **Clear models and resources for building online content should be established, targeted at both blended versions of on-campus courses and purely online courses.** This should focus on the three key areas of (1) **content**, including videos, websites, online textbooks, and other media; (2) **assessment**, including computer-based systems, CBTF, remote online testing, peer assessment systems, and other automation systems; and (3) **interaction**, between faculty and students, TAs and students, and student-to-student.
16. Previous EWG reports emphasized the need for EngrIT education projects to use an agile methodology, including being iterative, incremental, and evolutionary, using face-to-face communication with stakeholders, and including customer (faculty) representatives on the development teams. One recent example where this has been successfully done is the CBTF scheduling software development. **This type of agile methodology should be more widely adopted for educational IT projects.**
17. **Support for Linux in education (EWS, VMs, software, etc) should be enhanced.**
18. The "Course profile system" and "Interactive teaching spaces" projects have been recommended by EWG reports for the past several years. **Both of these projects are still needed to support excellence in education and should be undertaken.**
19. **The college should establish a student laptop policy that requires ownership of a minimum level of laptop.** This is partly targeted at reducing the growth rate of EWS, but also in enabling more computing use in courses. The "Student Technology Ownership and Usage" survey (Appendix 3) indicates that most students already own laptops and can provide guidance to future decisions about a laptop policy.

Appendix 1: Charge Letter

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College of Engineering

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September 1, 2016

Engineering at Illinois IT Governance – Education Working Group:

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Ashlynn Stillwell (CEE)
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Rebecca Wiltfong (Physics)

Dear Colleagues:

Thank you for agreeing to serve on the Engineering at Illinois IT Governance Education Working Group for the academic year 2016-2017. This working group is critical to helping ensure that IT support of the educational needs of instructors, and students in the College is of the highest quality and reliability.

Your recommendations and comments are advisory to the Associate Dean for Information Technology, with primary responsibilities for:

- Reviewing policies concerning the sustainability and provision of any needed education IT that enhances the College education mission, both at the Engineering College level and at the campus-level.
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You will also be asked to provide an assessment at the end of the academic year on the current state of IT support for education activities. Professor West has graciously agreed to chair this working group. He will be in contact with you soon to arrange for your first meeting. Professor West will also represent your working group on the Engineering at Illinois IT Governance Executive Advisory Committee.

I am thankful to all of you for your willingness to contribute to this most important work for our College. I look forward to joining you at your first meeting to discuss the charge and answer any questions.

Sincerely,
Roy H Campbell
Associate Dean for Information Technology