

Democratizing Faculty Development - Establishing a Training Program at a New Computer Science University in Russia.

Ms. Oksana Zhirosh, Innopolis University

Oksana Zhirosh is a Head of English Division at Innopolis University, Innopolis, Russia. With over 15 years of experience in education, she is focused on the research in teaching methodology, gender diversity in STEM, teaching intellectually advanced youth.

Dr. Joseph Alexander Brown, Innopolis University

Joseph Alexander Brown was born in Niagara-on-the-Lake, ON, Canada, on July 6, 1985. He received the B.Sc. (Hons.) with first-class standing in computer science with a concentration in software engineering, and M.Sc. in computer science from Brock University, St. Catharines, ON, Canada in 2007 and 2009, respectively. He received the Ph.D. in computer science from the University of Guelph in 2014.

He received the 2009 Graduate TA Award from Brock University. He is an ISW Trainer and has facilitated numerous training for Russian educational improvement.

He previously worked for Magna International Inc. as a Manufacturing Systems Analyst and as a visiting researcher at ITU Copenhagen. He is currently an Assistant Professor and head of the Artificial Intelligence in Games Development Lab at Innopolis University in Innopolis, Republic of Tatarstan, Russia and an Adjunct Professor of Computer Science at Brock University, St. Catharines, ON, Canada.

Mr. David Tickner, Faculty professional development consultant

David Tickner, Faculty Professional Development

I worked with the School of Instructor Education at Vancouver Community College (VCC), British Columbia, Canada, for over thirty years, conducting numerous face-to-face and online courses of the BC Provincial Instructor Diploma Program (PIDP). Course participants included faculty from public and private colleges in BC, Alberta, and the Yukon as well as trainers from government, business and industry, and other settings. I served a term as Head of VCC School of Instructor Education.

I am one of the founders of the Instructional Skills Workshop (ISW) Program. I have facilitated numerous ISWs and other faculty development activities over the last forty years in Canada and internationally, most recently in Taiwan, Russia, and India.

davidtickner.ca

Democratizing Faculty Development - Establishing a Training Program at a New Computer Science University in Russia

Abstract

Development of faculty teaching capabilities is a key responsibility in the educational process of a university, which requires skilled educators in order to not only present material but present in a manner which is based on current best practices. In this evidence-based paper we examine the building of a training in keeping with current best practices for a minimal overhead cost, by engaging faculty. It has been found that the Instructional Skills Workshop (ISW) was able to improve faculty engagement in the learning process, address individual goals, inspire new educators, and lead to the development of a culture and value set of teaching and learning at Innopolis University.

Introduction

Innopolis was established on December 24, 2012 in the Republic of Tatarstan, Russia as a technological hub city. As part of this development, Innopolis University (IU) was established in 2012, in order to build a technological workforce for the surrounding industrial growth and high technology enterprise [1, 2]. Established as both an internationalizing factor and a center for innovations, the University sought not only to bring in a faculty from all over the globe [3] but also to be a location which would have a focus on the educational process.

This has required both a needs analysis in order to quickly develop and train international and local faculty and admin on current best practices in teaching as well as a shift towards practice-based learning. This move was supported by a team composed of faculty and admin and did not require recourse to a specialized center for teaching and learning but utilized the service requirement from the faculty and current resources in the University, making for a meaningful change with little cost. In order to simplify the verbiage, we will use the term *faculty* to refer to all those involved in the teaching process for this paper including professors at rank, instructors, and teaching assistants. The operational team aims to develop a quality-oriented teaching culture in the recently launched university. The ISW implemented with recourse to the vision of the program and with the support from admin and development of a core team of staff members trained leads to better teaching processes evidenced from both qualitative (teacher interviews) and quantitative (survey results) methods.

The ISW

The Instructional Skills Workshop (ISW) is designed to encourage reflective practice and to assist participants in developing their teaching and feedback skills. The underlying principles of the ISW include: participatory learning, diversity of learning, adult learning, and the building of community that can be utilized in classrooms and institutions. After successfully completing the four-day program (24 hours), participants receive a certificate of completion recognized by many international institutions. Participants also benefit from joining a network of colleagues who are

committed to self-discovery and continual improvement of teaching and learning. Interested participants can become facilitators of the ISW program by taking the five-day Facilitator Development Workshop (FDW) and becoming part of an institutional team responsible for delivering and supporting the ISW program.

Widely recognized as a model for peer-based instructional development, the ISW is designed to strengthen instructors' skills through intensive and practical exercises in learning-centered teaching. Mixing opportunities for small and large group interaction, the ISW program engages participants in:

- planning and delivering 10-minute lessons
- developing participatory instructional techniques
- listening actively
- learning and teaching collaboratively
- modelling adult learning principles
- generating effective feedback and discussion

The ISW was first developed in British Columbia, Canada in 1979 as a response to requests for professional development programming for instructors of the newly created colleges. The ISW has since grown and expanded across Canada as well as into the United States and many other countries providing faculty development support for colleges and universities at all levels including professors, instructors, and teaching assistants. The ISW Program also provides support for instructors and trainers in many areas of the public and private sectors [4], [5]. The ISW International Advisory Committee supports annual professional development events for ISW facilitators and maintains an international listserv and website. For more information, visit <http://iswnetwork.ca/>.

Background and needs assessment.

The following section describes the needs analysis procedure and results; training program launch and results; challenges and considerations after one year of implementation; further plans.

Carnegie Mellon University (CMU) was performing consultancy for Innopolis University (IU) during the new university launch period. The CMU assessment report pointed out that, to play its role of the source of highly skilled IT specialists for the hub, IU will need the faculty with considerable content and industry expertise, as well as strong teaching skills. CMU's recommendation was to ensure that the faculty should be aware of the fundamentals of course design, research-based principles of learning, and are "equipped with a broad range of teaching approaches and techniques." The document highlighted the importance of informed and reflective pedagogical decisions: e.g. the faculty should know "how (and why) to articulate clear, learner-centered, measurable learning objectives" and "when, and why to employ particular

teaching strategies.” Finally, CM suggested establishing a Center for Teaching Excellence at IU, offering, on a regular basis, workshops and seminars on teaching topics, consultations, classroom observations, practices and events for sharing teaching ideas, teaching skills acknowledgement [6].

IU fully acknowledges the necessity of the teaching staff instructional skills development. The initial group of IU teaching staff underwent a CMU-developed pedagogical training program based on the principals described in *How Learning Works* [7]. Further, a practice of peer and mentor observations was launched at IU in which faculty would observe and mentor individual TAs in their own classes; along with that a practice of regular workshop was initiated by an Assistant Professor at IU, who coordinated bi-weekly workshops held by IU faculty for IU faculty (e.g. *Students Motivation, Effective use of space, and Using a whiteboard v. slides*). The actions were *ad hoc* and based upon faculty involvement and did not engage evenly across all faculty in all courses.

In order to establish a faculty professional development unit, according to CMU recommendations, and launch locally a sustainable training program that would address the needs of all staff involved in teaching, a needs analysis was performed in October and November 2016. The part of teaching staff that, according to peer and mentor classes observations and students’ feedback, needed immediate attention, were Teaching Assistants, hence 2016 needs analysis substantial focus on TA’s instructional skills development needs. TAs training needs were researched by means of:

TA’s classes observations. 20 out of 25 TAs were observed when conducting labs. An email was sent to the TAs prior to the observations, indicating times of observations and personal interviews, observations purpose and duration. The duration of the observation session varied from 30 to 90 minutes. During the observations, the following data were collected: class date and period of observation, TA’s name, course name, group ID, classroom setup, number and position of students, instruction language, equipment present and used during the class, observation period, TAs verbal instructions, sequence of activities, students’ responses, interaction patterns.

Personal interviews with TA’s. Out of 20 TA’s observed, 14 were interviewed personally. Each interview lasted 30 to 45 minutes. The following data were collected during the interviews: TA’s status at IU, lab/institute, courses and groups taught, TA’s teaching experience (number of semesters), TA’s current responsibilities related to teaching, TA’s instructional skills development needs – for the current period and for when they were beginning to teach.

Teaching assistants participating in the needs’ analysis were junior researchers and PhD students with from 1 to 9 semesters of teaching experience. The interviews transcripts were analyzed by two researchers using theme analysis technique.

Needs analysis findings

TA's teaching related responsibilities were taking from 25% to 100% of TA's working time and they reported being involved in teaching activities related to lesson planning and teaching, materials development, assessment, consultations and research supervision (Appendix 1). During the individual interviews, TA's reported their challenges and training needs, related to subject knowledge and course team communication, but mostly to lesson planning, student engagement while teaching classes and developing confidence as instructors (Appendix 2). Besides, in Spring 2017 semester, course instructors performed regular observations of their TAs teams, and most of them indicated students' engagement as the skills that required development, even in those TA's who were identified as role models (Appendix 3).

In summary, the needs assessment process indicated that faculty development activities for TAs should be focused on the lesson level and address the following needs:

- giving TAs a chance to practice lesson planning, teaching (for some for their first time), giving feedback and performing assessment
- equipping TAs with a lesson planning framework, teaching techniques for active learning, and giving/getting feedback tools
- providing an opportunity to reflect on the experience of teaching
- having a chance to learn about pedagogical concepts
- getting advice from their colleagues regarding their instructional practice issues
- inspiring young educators

Anticipated benefits of choosing the ISW Program

Hence, ISW choice as a workshop that would meet those needs. It is worth mentioning that the relevance and the outcomes of the workshop were proven by the personal experience of one of the IU professors, this fact significantly influenced the workshop final choice as an induction workshop for IU TA's.

Successes of the ISW Program in other institutions reflect the following recurring themes [8], [9], [10]:

- Developing support from all levels of the institution from students and TAs to senior management is a critical feature of ISW implementation and success
- Participants use practical lesson planning formats based on levels to the subject matter to be learned.
- The ISW Program advocates and models participatory learning; in particular, learning by doing.
- Student learning is the focus, not simply teacher performance. Students report greater satisfaction with the learning process after a teacher takes an ISW. Student marks tend to be higher although this is not a predominant finding.
- Over time, institutions that implement ISW report increased student learning and greater teacher satisfaction with their efforts.

- The ISW is collegial and peer-based rather than unidirectional expert-based. Participants observe each other and provide appropriate and necessary verbal, written, and video feedback to each other.
- Participants report that the ISW has been transformational; in particular, as these subject-matter experts experience new developments in their teaching expertise
- ISW fosters reflective practice techniques that can be carried into other areas of professional life.
- The ISW program is a professional development program, not a remedial program or a method for performance appraisal.
- Most institutions, who originally implemented the ISW to support new teachers, have also reported that experienced teachers benefit. As well, in many ISWs, both new and experienced teachers when working together report increased institutional collegiality.

It is worth mentioning that the relevance and the outcomes of the ISW were highly recommended by the personal experience of one of the IU professors, a fact that significantly influenced the final choice of the ISW as an induction workshop for IU TAs. Faculty involved in the needs' analysis, identified other training needs, valid mostly for the faculty, e.g. research supervision, course design, and also active learning approaches. On consideration of the needs analysis results and available training options and their costs, and cases described in literature, e.g. [11], the decision was made by IU management, that teaching staff professional development responsibilities would be distributed among the faculty members, i.e. no Teaching Excellence unit would be developed. A group of interested Computer Science Department Professors and TAs will be trained to facilitate teaching and supervision workshops. The workshops will be selected, budgeted and, after IU management approval, coordinated by a group of volunteering faculty. Thus, the training program will be cost efficient, meet closely IU teaching staff needs, and bring in best and locally valid training practices.

ISW launch at IU

The full cycle of ISW training comprises three stages: Instructional Skills Workshop (ISW), Facilitator Development Workshop (FDW), and Trainer Development Workshop (TDW). ISW was primarily planned to be at IU an induction workshop for the TAs. The plan was that six Professors will become ISW Facilitators during Spring 2017, and ISW will be launched as a regular induction workshop for IU TAs as of Fall 2017. After a year of conducting ISWs, the initial group of Facilitators will be eligible for ISW Trainers certification. Thus, IU will be able to train ISW Facilitators when necessary.

ISW launch timeline:

December 2016, initial ISW budgeting - needs analysis was completed and presented to IU management in November 2016. The Advisory Committee of the ISW quickly responded with a

suggested consultant Trainer making it possible to budget the workshop for the next year in December.

Beginning 2017, initial ISW scheduling – the training plan required 3 days for the first level of training (ISW), and 5 days for the second level of facilitators certification (FDW). End of May 2017 was selected for both workshops, as there are no teaching responsibilities during the period. Thursday through Saturday of the 3rd week of May, 8 hours per day, were scheduled for the ISW; Monday through Friday of the 4th week of May, 7 hours per day was scheduled for the FDW.

January – April 2017, initial ISW paperwork – contract and Russian visa processing for the consultant ISW Trainer took about four months.

January – May 2017, initial ISW participants choice - selected were six participants for two main criteria: the evidence of their interest in teaching and teaching skills development, based on their prior participation in workshops and their likelihood for the long-term retention at IU. The participants were aware that they would form the team launching ISW for the next semester.

May 2017, initial ISW and FDW workshops – ISW and FDW conducted by David Tickner, ISW Trainer. The 6 participants for ISW were: 2 IU Assistant Professors, 2 IU junior researchers (TA’s), 1 IU administrator, 1 administrator of a partner university. The 6 participants for FDW were all from Innopolis University: 3 Assistant Professors, 2 junior researchers (TA’s), 1 administrator.

Initial Facilitator 1	12	Initial Facilitator 4	2
Initial Facilitator 2	3	Initial Facilitator 5	3
Initial Facilitator 3	2	Initial Facilitator 6 (resigned)	0

Table 1. Number of ISW’s conducted by initially trained IU ISW Facilitators during 2017-18 academic year.

July 2017 - August 2018 – 12 ISW conducted, 10 in English (with co-facilitators) and 2 in Russian (with 1 facilitator), about 2 per month during teaching months. A number of workshops conducted by an initial training Facilitator are shown in Table 1.

The majority of the workshops were scheduled in 4 successive days, Thursday through Sunday, 7 hours per day with a 1-hour lunch break.

3 sessions were with 6 participants, 5 sessions with 5 participants, 4 sessions with 4 participants. Round 78% of the participants were IU employees (46), another 22% were from partner educational organizations (13). IU ISW participants categories are shown in Table 2. IU Provost for education and Computer Science Dean are listed as Teaching admin and Faculty respectively.

Teaching Assistant (TA)	28	60.87%
Faculty	8	17.39%
Non-teaching admin	7	15.22%

Teaching admin	2	4.35%
Student	1	2.17%

Table 2. Number of IU ISW participants 2017-2018 academic year, by category.

September 2017 – May 2018 –second FDW participants selection. The participants were observed while ISWs and selected based on their interest in teaching quality development, teaching skills and likelihood to work at IU for a long period of time. The ten FDW participants in the second course were all Teaching Assistants. The purposes behind the decision of involving TAs as ISW Facilitators were to balance ISW facilitators’ team, to distribute workload, to ensure addressing TAs needs, to increase the quality of teaching among TA’s.

May 2018 – There was one TDW facilitated by ISW Trainer David Tickner followed by 2 FDWs co-facilitated by David Tickner and a team of initial Facilitators. Five initially trained Facilitators certified as ISW Trainers, the second cohort of ISW Facilitators (N 10) certified.

Thus, within one-year, full ISW cycle is completed at IU, and IU is now capable of reproducing ISW facilitators when necessary. Out of 6 initially trained ISW Trainers, 4 can be qualified as active, 1 as moderately active, 1 as non-active (has not conducted any ISWs). The partner university administrator, who participated in the initial ISW, has not launched ISW training in her university. Out of the second group of Facilitators, those certified in May 2017 (10 TAs), six are active. Out of the remaining 4 non-active members, two have resigned, one has been unable to facilitate due to job responsibilities elsewhere not allowing for the necessary time, and one states they are reluctant to facilitate the workshop. We would expect an outcome of active facilitators is around 60% based on our experience.

Initially planned for TA’s instructional skills development, within one-year ISW attracted professors, administration including top management, and even a student. On CS Dean’s request, ISW became part of the orientation training for all teaching staff joining IU. Part of the workshop, an ISW lesson planning framework, has been utilized by the Students Affairs office while training instructors for the regular Summer school and Student clubs. IU Students Affairs office in Spring 2019 is launching ISW on a regular basis for the students involved in Students Clubs and in short-term educational events, like e.g. Summer School, as junior instructors.

ISW impact on instructional practices, as perceived by the instructors.

To assess if there is any change in teaching philosophy and practice after participation in ISW, an ongoing survey is launched. For articulating the survey questions 6 semi-structured interviews were conducted with ISW participants. The sample was: 1 IU Assistant Professor, 1 IU TA (a PhD student) teaching her first year, 1 IU experienced TA (a researcher), 1 IU Professor of Practice, 1 non-IU CS instructor teaching adults, 1 non-IU business representative conducting product training in his company. The guiding question asked was: *Are you noticing any changes in your instructional practice after ISW?* The individual interviews lasted 30 to 40 minutes and

were conducted face-to-face and remotely. Content analysis was used to reveal the changed elements of their instructional practice.

The in-depth interviews participants reported a variety of changes they were noticing both in instructional practice, and also in the operational one (*'started using agenda during regular briefings'*) and in personal life (*'when talking to their spouse, began to distinguish constructive feedback from emotional, and am able to convert the latter to the former'*). We will focus on the reported ISW impact on the instructional practice and teaching philosophy. The list of the questions formulated based on the interviews is in Appendix 4. The survey is sent to IU ISW participants, actively involved in teaching, after they were teaching 2 months having participated in ISW. Thus far 22 responses have been collected and analyzed (with about a 60% response rate). The decision was made to not measure ISW impact by analyzing the correlation with the students' course satisfaction surveys because similar sample responses cannot be collected before and after the ISW.

The survey results indicate changing participants' mindset and teaching practices to a more learner-centered approach (Appendix 4). 82% of the respondents reported a positive shift in their instructional practices in terms of setting clear objectives in terms of what the learners will be able to do at the end of the class; 73% of those are noticing they are better aligning lesson objectives and post-assessment activities and 68% of the respondents reported they actually started allocating time for post assessment activities, which was one of the biggest changes in instructional practices as 11 (50%) participants replied they were not using post assessment activities before they participated in ISW, while after ISW, 2 (9%) participants reported they were still not using them. One more significant perceived change in instructional practices, increase from 5 to 15 out of 22 respondents' positive replies, was the one on giving students chance to reflect on their learning outcomes, i.e. summarize lessons outcomes at the end of the class/module. Another ISW impact is on the instructors' willingness to experiment with teaching tools (68%) and vary teaching techniques (64%). The least impact is reported to be on the instructors' practice of using a clicker during classes (9%), where only 2 participants reported they were more likely to use the device, and asking their students questions (18%), where 1 participant reported she began doing so, and 2 participants reported they are now more willing to do so, while the majority of the respondents reported they already were using questions during classes. Respondents' replies below illustrate some perceived ISW impact on their instructional practice:

- *At least I try to organize the space, arrangement etc. Try to analyze their attitude towards the techniques I am using and can adopt what I have prepared accordingly.*
- *Better understanding and answering on question "for what?"*
- *They started giving me more feedback on my teaching practices.*
- *I've learnt how to manage lesson within time.*
- *More clear understanding purposes of the lessons and it helps to reach goals easier*
- *Since ISW showed us various techniques to convey material and articulate questions. I have seen students interacting more. So, it seems to me that they are more enthusiastic and involved during class.*

- *My lab sessions became more structured and more interesting. I don't hesitate to try new techs and approaches during my labs.*
- *Being more aware of the importance of reflection on students' learning*
- *ISW - is an opportunity to develop different kinds of tutorials, to understand own role within student groups, and set goals for next steps of personal improvement*
- *I'm glad to do this training*
- *Very powerful and useful technique*
- *Sometimes it just needs much time than actually available.*
- *Now is much easier to make plan of the lesson. Before I did it intuitively.*
- *Apparently, after the ISW I started applying some of its practices unconsciously.*
- *I gained more confidence in my teaching and planning*
- *It added mindfulness both to teaching and life*
- *Met a great diversity of colleagues that definitely has broadened my understanding about effective teaching*

Another evidence of ISW impact on improvement of teaching quality at the organization level is that TAs and instructors who received Teaching Awards in 2017 and 2018 were ISW participants. Further, CS Dean has applied for ISW Facilitator certification, and the Head of Faculty Affairs is launching ISW as a part of Students' Clubs leaders training (Students' Clubs are part of informal education), thus ISW at IU is perceived as a worthwhile practical technique.

Discussion

As the result of the first year of implementation, the peer-based faculty professional development model proved to work well for Innopolis University for several reasons: it closely addresses local needs; it improves instructional practices; it allows for creating a community with shared values; it is cost-efficient. The obvious challenge is extra workload for the faculty. However, the challenge can be addressed by certifying a group of facilitators, the size of it being sufficient for fair and manageable distribution of the workload.

The following six items should be considered while ISW launch:

1. Scheduling (days and timing per day) - the workshop lasts 24 to 36 hours and requires full participation, as well as reflection and preparation, which are essential in this workshop. The best time is when participants have no teaching responsibilities, e.g. before semester start, or during a Professional Development Week.
2. When should there be the involvement of new Faculty - before or after they have taught their first class? - there are some benefits and risks in both cases. Some faculty have never taught before, or have never taught in English before, and they appreciate a chance to role-play teaching before they actually teach in real class. However, for some faculty it is better to first teach a real class and realize what is difficult for them in terms of lesson planning and teaching, and then attend the workshop. At IU it is preferred that faculty attend ISW before starting to teach.
3. The risk with obligatory training is obviously lack of motivation resulting in disruption of group work. We addressed this challenge by involving management as role models

(Provost for Education, Dean, Head of an Institute participated in ISW); by allocating effort during each workshop day for personal goals setting.

4. Facilitators should be selected not only based on the criteria of their teaching skills and how likely they are to work long at the university, but also considering if they share ISW values and how likely they are to promote them.
5. Due to contractual obligations and the lower attrition rates, it is best if the facilitators are primarily drawn from the body of professors or administrators.
6. The program should be publicly announced to the faculty and communication regarding program implementation should be expressed centering on the aspects of continuous improvement rather than this as an evaluation in order to have buy-in from the participants and their direct supervisors.

Conclusion

The ISW has led to a marked improvement in the teaching processes at Innopolis University supported by both qualitative measures in the response from the faculty and administration. The current direction of the internal team of ISW Trainers is to improve the program via an increase in the number of trainers, the development of consulting programs, and the creation of Innopolis as a location of a Symposium to draw in local and international partners.

Further, initiatives have been made to distribute the program in the local community as an outreach to other secondary (Lyceum) and post-secondary institutions in the local area (KAI). To expand this outreach, it is planned for training materials to be translated into Russian. Further, there is a goal to make the training cost neutral by consulting for hire to other institutions and industry partners in the region.

The administration and the faculty have also been expressing an interest in moving the ISW to mandatory training for all new faculty (i.e. not just the incoming teaching assistants) which will require a further increase in the number of trained facilitators.

Acknowledgements

We would like to express our gratitude to Rupi Natt, who assisted us with the survey questions preparation; to in-depth interviews participants, based on whose responses the survey questions were formulated; to 22 IU ISW participants who spent their time responding the survey questions.

References

- [1] T. Stanko, O. Zhirosh, P. Grachev, "Innopolis University, a Center of a Newly-Developed IT Hub in Russia: The Results of Four Years of Academic Operation". In: *Teaching and Learning in a Digital World. ICL 2017. Advances in Intelligent Systems and Computing*, Auer M., Guralnick D., Simonics I. (eds), vol 715. Springer, Cham
- [2] D. Kondratyev, A. Tormasov, T. Stanko, R. C. Jones and G. Taran, "Innopolis University-A new IT resource for Russia," *2013 International Conference on Interactive Collaborative Learning (ICL)*, Kazan, 2013, pp. 841-848. doi: 10.1109/ICL.2013.6644718
- [3] S. Karaperyan, A. Dolgoborodov, S. Masyagin, M. Mazzara, A. Messina, E. Protsko. "Innopolis Going Global: Internationalization of a young IT University". In *Proceedings of the 6th International Conference in Software Engineering for Defence Applications (SEDA)*, Rome, 2018.
- [4] International ISW Advisory Committee. "The Instructional Skills Workshop (ISW) Program description", 2017. [Online]. Available: https://www.iswnetwork.ca/wp-content/uploads/2018/02/ISW_Program_Description_March-2017.pdf. [Accessed January 31, 2019].
- [5] R. Day and the ISW International Advisory Committee. "The Instructional Skills Workshop: The Heart of an Educator Learning Community in British Columbia and Beyond". *Simon Fraser University*, 2012. [Online]. Available: https://www.iswnetwork.ca/wp-content/uploads/2012/07/Hand_ISW_ISSoTL1.pdf. [Accessed January 31, 2019].
- [6] G. Taran et al., "Assessment Report", A Partnership Between the Republic of Tatarstan, Carnegie Mellon University and iCarnegie Global Learning, iCarnegie, Pittsburgh, PA, 21 December 2012.
- [7] S. A. Ambrose, M. W. Bridges, M. DiPietro, M.C. Lovett, M. K. Norman, *How learning works: Seven research-based principles for smart teaching*. San Francisco, CA: Jossey-Bass, 2010.
- [8] D. Dawson, P. Borin, K. Meadows, J. Britnell, K. Olsen, and G. McIntyre, "The Impact of the Instructional Skills Workshop on Faculty Approaches to Teaching". Toronto ON: *Higher Education Quality Council of Ontario*. 2014. [Online]. Available: <http://www.heqco.ca/en-ca/Research/ResPub/Pages/The-Impact-of-the-Instructional-Skills-Workshop-on-Faculty-Approaches-to-Teaching.aspx>. [Accessed January 31, 2019].
- [9] Higher Education Quality Council of Ontario, "The impact of the Instructional Skills Workshop on faculty approaches to teaching". 2014. [Online]. Available: http://www.heqco.ca/SiteCollectionDocuments/Formatted_UWO_Ryerson.pdf. [Accessed January 31, 2019].
- [10] A. Macpherson, "The instructional Skills Workshop as a transformative learning process." *Thesis submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy*. Burnaby, BC: Simon Fraser University, 2012.
- [11] M. Prince, R. Felder, R. Brent, "Engineering Instructional Development: Programs, Best Practices, and Recommendations." *Journal of Engineering Education*, 2011.

Needs assessment findings. Teaching related activities TA's reported being involved into.

Course design:

participate in course team meetings
participate in the meetings with the Students Representatives

Materials development:

slides preparation for labs/tutorials
preparing visuals for professor's lectures
work with LMS (Moodle; upload slides, assignments, grades)
preparation of the labs/tutorials assignments
preparation tasks for final exams
preparing room and equipment for the professor's lectures
proofreading presentation, tests, exams papers

Front teaching and consultations:

recitation lectures
conducting labs/tutorials
students help – during office hours and via email and telegram messenger
lecturing (occasional substitution)

Student performance assessment:

checking and grading the labs/tutorials assignment
giving feedback to the students on their performance
grading thesis, course papers, projects
participation in appeal sessions

Student research supervision:

thesis, projects, course papers co-supervision

Needs assessment findings. TA's reported training needs.

Planning and preparation

Current TAs training needs:

- Course content: sometimes TAs do not have deep knowledge of the course.
- Lesson planning: preparing challenging tasks and allocating appropriate time, appropriate order of activities. Preparing enough materials.
- Slides preparation – how much text, how much animation.
- Communication between TAs and the course instructor.
- Ways to better explain concepts.

New TAs training needs:

- The importance of good preparation, including technical check.
- Time planning.

Teaching

Current TAs training needs:

- How to keep students involved and motivated during classes and course.
- How to stimulate discussion.
- How to make a lecture interactive.
- Public speaking – gestures, voice etc.
- How to check students' understanding.
- How to deal with mature students confidently.
- How to deal with the questions you don't know the answers to, confidently.
- How to deal with a group of students with a huge diversity in their level of knowledge.
- How to utilize pair and group work.
- What is learner centered approach in more details.

New TAs training needs:

- Coping with stress.
- Public speaking.
- Dealing with 'naughty' students.
- Giving instructions.
- Teaching in English.

Assessment and feedback.

Current TAs training needs:

- Understanding grading criteria.
- How to grade fairly and give feedback confidently.
- How to give feedback that motivates.
- How to encourage students to ask questions.

New TAs training needs:

- LMS (Moodle)

Communication with the students

Current TAs training needs:

- Appropriate communication styles with the students.
- Telegram messenger policy (students will send messages out of business day).

Communication with the faculty, course instructors

Current TAs training needs:

- Team work while delivering a course.
- Appropriate communication styles with the Professors, other TA's.

New TAs training needs:

- Taking over course materials.

Other training needs for the current TAs:

- General pedagogical knowledge.
- Teaching at the university level.
- Coping with the fatigue - techniques to quickly restore the energy.
- How to assess the validity of the tasks while preparing them.

Other training needs for the new TAs:

- Choosing your teaching philosophy.
- Code of conduct.

TA's training needs identified as a result of TAs' classes observations (N20) by a project manager, during needs analysis in Fall 2016 semester:

Preparation and planning:

- Planning lesson structure.
- Preparing room and space – furniture arrangement, light, equipment, clean whiteboard, markers.
- Sticking to the course rules –language of instruction, taking notes policies.

Teaching:

- Interaction patterns for better students' involvement – asking questions, pair and group work.
- Monitoring class.
- Checking students' prior knowledge and understanding.
- Dealing with early/late finishers.

Assessment and feedback:

- Giving formative feedback on students' performance during the class.
- Encouraging peer feedback.

Mentor observations recommendation for TA's training needs, collected in Spring 2017 semester.

22 TA's were observed by 8 course instructors; 18 observations got verbal comments. The table below represents the number of times a particular training need was mentioned in the course instructors' reports.

students' engagement	13
checking students understanding	2
instructor-students interaction	1
pair/group work and monitoring class	1
teaching in English	3
time management	2
space organization	1
whiteboard usage	2
speech - voice, pace	2

2017-2018 academic year ISW participants' self-assessment of ISW impact on their instructional practice.

Likert scale (-2 to 2) was utilized in the survey. 22 responses have been collected. Extreme disagreement equals -2, extreme agreement equals 2.

Question example: *Before/After ISW I was/am limiting the amount of content covered in the class or course and focus more on students' understanding.*

Survey questions	Before ISW	After ISW	
Paying sufficient attention to students' learning results	0	0	count disagree
	5	0	count neutral
	17	22	count agree
Limiting the amount of content covered in the class or course and focus more on students' understanding.	3	0	count disagree
	8	1	count neutral
	11	21	count agree
Being learner-focused	2	0	count disagree
	6	3	count neutral
	14	19	count agree
Tend to teach in an interactive way	5	0	count disagree
	4	0	count neutral
	13	22	count agree
Setting clear objectives in terms of what the learners will be able to do/know/value by the end of the class	7	0	count disagree
	3	3	count neutral
	12	19	count agree
Manipulating with the space in my lessons	6	2	count disagree
	5	1	count neutral
	11	19	count agree
Allocating appropriate time for post assessment activities	11	2	count disagree
	5	5	count neutral
	6	14	count agree

Always giving my students chance to understand and articulate what they have learnt	5	2	count disagree
	9	5	count neutral
	8	15	count agree
Consciously aiming to make sure that there is an alignment between lesson objectives and post-assessment	7	0	count disagree
	6	4	count neutral
	9	18	count agree
Giving students chance to summarize what they have learnt	9	5	count disagree
	8	2	count neutral
	5	15	count agree
Communicating with my colleagues in my course easily, because we use the same instructional terminology	1	0	count disagree
	9	7	count neutral
	12	15	count agree
Giving feedback to my colleagues and students comfortably	5	0	count disagree
	1	0	count neutral
	16	22	count agree
Listening attentively and thus giving meaningful feedback and advice to my students/learners	3	0	count disagree
	5	2	count neutral
	14	20	count agree
Asking questions to my students during my classes	1	0	count disagree
	0	0	count neutral
	21	22	count agree
Regularly collecting feedback from my students	6	3	count disagree
	5	1	count neutral
	11	18	count agree
Utilizing students' group work in my classes	6	2	count disagree
	4	2	count neutral
	11	18	count agree

Experimenting with teaching techniques in my classes	7	1	count disagree
	7	1	count neutral
	8	20	count agree
Varying teaching techniques in my classes	8	0	count disagree
	5	2	count neutral
	9	20	count agree
Using clicker for changing presentations slides in my classes	10	11	count disagree
	2	1	count neutral
	10	10	count agree
Wanted my colleagues to observe my classes and provide peer feedback	5	4	count disagree
	8	4	count neutral
	9	14	count agree
Willingness to participate in professional development workshops	3	1	count disagree
	5	3	count neutral
	14	18	count agree

The share of ISW participants reporting a change in their instructional practice.

Item	Share of participants
setting clear objectives in terms of what the learners will be able to do/know/value by the end of the class	82%
ensuring alignment between lesson objectives and post-assessment	73%
experimenting with teaching techniques in my classes	68%
allocating appropriate time for post-assessment activities	68%
varying teaching techniques	64%
limiting the amount of content covered in the class or course and focus more on students' understanding	59%
always giving my students chance to summarize at the end of the class and tell me what they have learned	59%
teaching in an interactive way	59%
manipulating with the space in my lessons – e.g. could shift desks or teach outside of the regular study room etc.	59%
feeling comfortable giving feedback to colleagues and students	50%
listening attentively and thus giving meaningful feedback	50%
paying sufficient attention to students' learning results	45%
letting students to articulate what they have learnt	45%

willing that my colleagues observe my classes and provide peer feedback	45%
being learner focused	41%
regularly collecting feedback from students	41%
utilizing group work	41%
willing to participate in PD	36%
being comfortable to communicate with colleagues, due to shared instructional terminology	32%
asking my students questions during my classes	18%
using clicker for changing presentations slides in my classes	9%

Overall delta based on 22 responses. Extreme sum disagreement with the statement equals -44, extreme sum agreement with the statement equals 44.

Item	SUM BEFORE	SUM AFTER	DELTA
experimenting with teaching techniques in my classes	1	28	27
ensuring alignment between lesson objectives and post-assessment	0	26	26
varying teaching techniques	1	26	25
allocating appropriate time for post-assessment activities	-7	17	24
setting clear objectives in terms of what the learners will be able to do/know/value by the end of the class	5	29	24
always giving my students chance to summarize at the end of the class and tell me what they have learned	-4	14	18
manipulating with the space in my lessons – e.g. could shift desks or teach outside of the regular study room etc.	6	24	18
teaching in an interactive way	13	31	18
feeling comfortable giving feedback to colleagues and students	13	31	18
utilizing group work	6	22	16
limiting the amount of content covered in the class or course and focus more on students' understanding.	11	27	16
regularly collecting feedback from students	8	23	15
listening attentively and thus giving meaningful feedback	14	29	15
letting students to articulate what they have learnt	5	19	14
willing to participate in PD	15	26	11
being learner focused	16	26	10
paying sufficient attention to students' learning results	19	29	10
willing that my colleagues observe my classes and provide peer feedback	5	13	8
being comfortable to communicate with colleagues, due to shared instructional terminology	13	20	7
asking my students questions during my classes	28	33	5
using clicker for changing presentations slides in my classes	-1	-1	0