

Professional development of novice math instructors

Encouraging the adoption of authentic teaching

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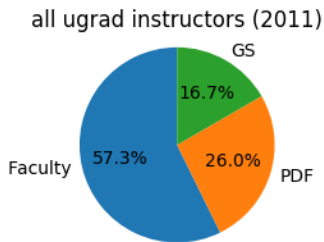
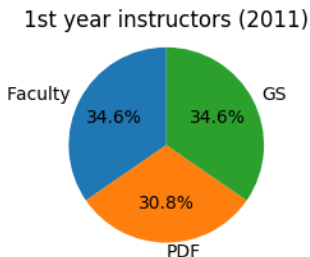
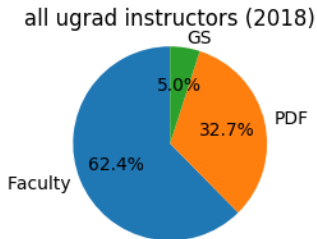
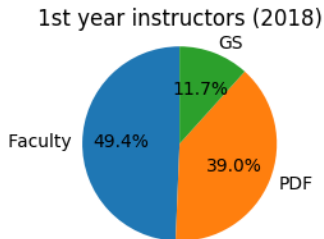
PD for Novice Instructors - Outline

Context & Existing Program

New Additions to Professional Development

Lessons Learned from Participants

Math Instructors by Type at UBC



Teaching Loads

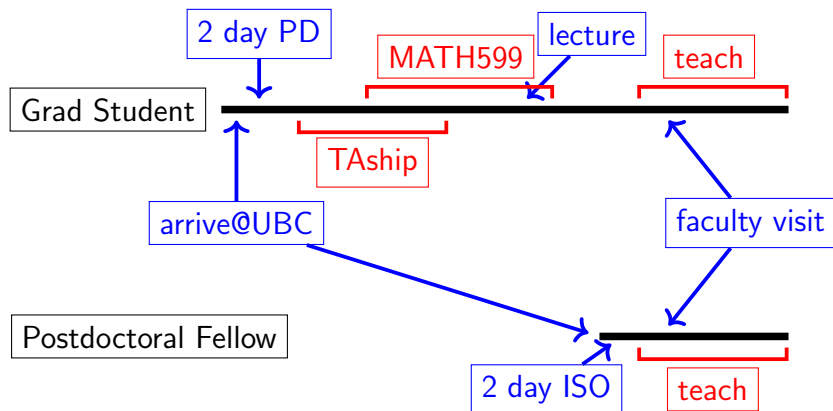
Graduate Students

- **Not all** graduate students teach
- A GS is given **at most 1 course per year**
- Teaching assignments are based on the **recommendation** of the **instructor of MATH 599**
- Usually given **1st year courses**

Postdoctoral Fellows

- Virtually **all** postdocs teach
- Most **teach immediately** upon arrival
- Typical load is **1 fall and 1 winter course**

The Path to Teaching



Blue: one-time event. Red: longer event

Graduate Student Professional Development

TA ships

- Some TAs include rich PD

MATH 599: Math Teaching Techniques

- Term-long 1-credit course
- Certifies GS to teach
- GS learn to prepare and deliver a lesson
- First opportunity to think about identity as teacher
- Meant to be practical: includes a live lecture

Other (optional) workshops/seminars

- math departmental ISW (Instructional Skills Workshop)
- seminar course: TAAP (TA Accreditation Program)

Postdoc Professional Development

Instructional Skills Orientation (ISO)

- 2-day workshop (taken on arrival to UBC)
- Modeled after the ISW
 - Workshops on lesson preparation
 - Participants give 10-minute mini-lessons
- Participants are assessed and their performance is passed on to relevant parties

Faculty Class Visits

First time instructors

- Receive a faculty member visit in the first two weeks
- Are given some feedback
- Are given a 'yes' or 'no' (no = removed)

Recently

- We introduced a 'conditional yes'
- Instructors are given extra support (mentoring)
 - class visits w/ feedback
 - visit to established teacher's classroom
 - student surveys w/ reflection

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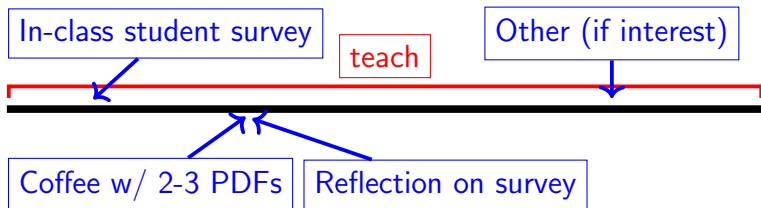
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New Additions to Professional Development

Lessons Learned from Participants

In Class Survey & PDF Coffee Groups

We have started doing the following PD for first-time PDFs

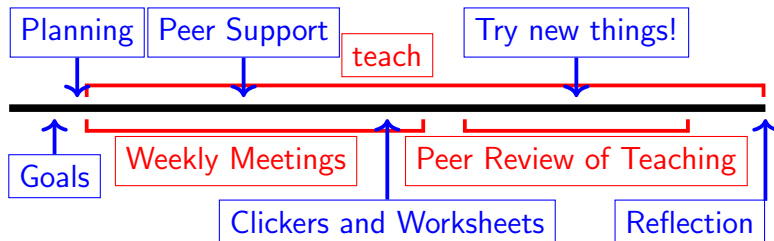


Other activities (based on PDFs goals)

- Peer Review of Teaching
- Visit to classroom with Clickers

Instructor Support Group (ISG)

A GS & PDF Community of Practice
(Piloted in 2017 with Cole Zmurchok with GS)



Participant Comments:

- “gave several ideas of things to try”
- “achieve our goals by doing self reflection”

Instructor Support Group (ISG)

Weekly Meetings

- Discussion, lecture swap, philosophy, case study, etc

Peer Review of Teaching

- Constructive peer feedback session to follow

Visits To Classroom of Exemplary Instructor

- Observe a particular technique (clickers)
- Note: will do more of this next time

Classroom Observation Protocol for Undergraduate STEM

- COPUS for short
- check-boxes of “what are the students/instructor doing?”

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Participant Philosophy

A change in/development of philosophy is enhanced by

- reflection on one's experience
- sustained discussion with peers

“Before the term my intension was **just lecturing**. But now, my intension is **how much the students get** from me & understand the subject & learn to **tackle problems on their own**.” (Instructor-centred → learner-centred)

Participant Practice

“I didn’t realize I wasn’t giving **clear instructions** for my **[worksheets]** until peer review”

“When giving students a **big problem**, I [now] let them work on it **in pieces** and come back to the board every once in a while.”

“[lecturing] **is not** better than active learning ... [but] some students **do not enjoy active learning** very much & they don’t read [before class].”

Typical pitfalls:

- Preparing a worksheet that is a **resource** or **homework**
- Leaving students to work on an **open problem** for too long

Summary

Novice instructors need a space to talk with their peers about what's going on in their class.

Integrated professional development is important for teaching philosophy and practice.

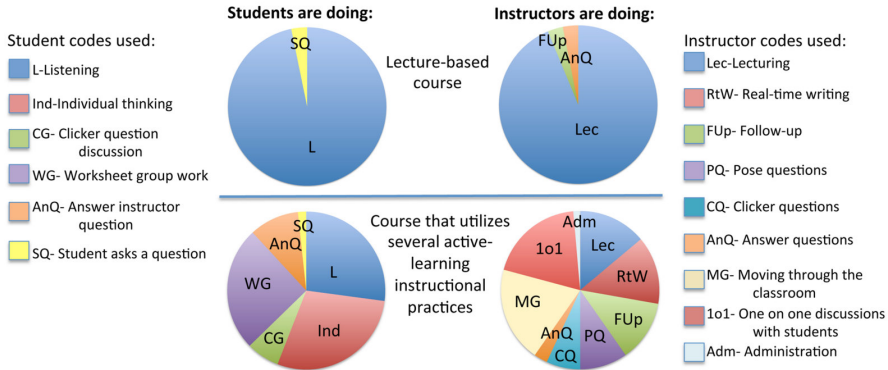
For the future continue to figure out:

- What works for novice instructors
- What misconceptions they have

Thanks!

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Classroom Observation Protocol for Undergraduate STEM



Classroom Observation Protocol for Undergraduate STEM

COPUS.xlsx - LibreOffice Calc

Calibri 11 B I U T L

A5:AMJ5 f_x = 0-2

1 Course, Instructor, Date, Room (room type), # students, Observer: Matt Coles

2 COPUS

3

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5 0-2

6 32

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8 36

9 38-40

10 40-42

11 42

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13 46

14 48-50

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Input line

A. Students doing

B. Instructor doing

C. Engagement

Comments: EG: explain difficult coding choices, analogies, etc.

"turn off "board lights"

"what is our last step ... what do we don't know ..."

"look at the computation at home" | stu: why an

"some summary of optimization problem strate

"need to repeat question ... something about

"go ahead and start this problem - let me kn

"students are mostly working quietly - a few

"noise goes up a little - students seem to be wo

"students are still working or talking in group

"who found the zeros - raise of hand" many s

"ended exactly on time

L Ind CG WG OG AnQ SQ WC Prd SP TQ W O Lec RiW FUp PQ CQ AnQ MG 1o1 D/V Adm W O L M H

27 22 0 0 0 4 9 8 0 0 0 0 0 0 21 14 1 9 0 8 3 0 0 1 2 0 0 0 0

43

59

L Ind CG WG OG AnQ SQ WC Prd SP TQ W O Lec RiW FUp PQ CQ AnQ MG 1o1 D/V Adm W O L M H

51% 0% 0% 0% 9% 21% 19% 0% 0% 0% 0% 0% 0% 36% 24% 2% 15% 0% 14% 5% 0% 0% 0% 2% 3%

Students are doing ...Percent of total student codes

Instructor is doing ... Percent of total instructor codes

Legend for Students:

- L Ind
- CG WG
- OG AnQ
- SQ WC
- Prd SP
- TQ W
- O

Legend for Instructor:

- Lec RiW
- FUp PQ
- CQ AnQ
- MG 1o1
- D/V Adm
- W O

20-minutes 50-minutes

Sheet 2 of 2 1 rows, 1024 columns selected PageStyle_50-minutes 17/17