

**THE BRITISH COLUMBIA COMMITTEE ON THE
UNDERGRADUATE PROGRAM IN MATHEMATICS AND STATISTICS**

BCCUPMS

MINUTES OF THE 98th MEETING, June 16th and 18th, 2020

Videoconference (via Zoom)

TUESDAY, June 16th, 2020

1. Welcome and Opening Remarks (9:06)

Ian Affleck (Chair) welcomed the participants to the unusual format on videoconference, reminding participants to remain on mute if they are not speaking

2. Adoption of Agenda (9:07)

The chair shared the screen to view the agenda. **Motion: That the agenda for the 98th meeting be approved, with the amendment of addition of a territorial acknowledgement.** M – Natasha Davidson, S – Chehra Aboukinane

Territorial Acknowledgement (Andrea Hyde) – territorial acknowledgment, noting that we are meeting across the province, and this includes a variety of different places, territory and first nations peoples.

Approved – 26 in favour, 0 opposed

Point of Order: Suzanne Feldberg asked about voting procedure, given the unusual environment for the meeting. The Chair mentioned the standard voting protocol, that there is only one vote per institution; however, a motion to extend voting to all persons present could be put forward as needed. Voting can be completed by ‘raising hands’ through Zoom.

3. Approval of Minutes of the 97th meeting (9:14). Motion: That the minutes of the 97th meeting be approved. M- Suzanne Feldberg, S- Costa Karavas

Discussion: Missing institutional reports will be included by Ian Affleck. Justin Gray noted that the 2019 report from SFU was missing from the minutes, and this will be merged into the final report.

Approved – 24 in favour, 0 opposed

Question: Wayne Nagata asked to clarify who is entitled to vote from an institution if there is a math and stats rep? Chair reminded that options are open, but the current standard is one vote per institution.

4. Announcements (9:16)

4.1. Introduction of Representatives (9:18) Chair scrolled down participants list and invited individuals to wave as they were introduced, in roughly alphabetical order. This was paused at 9:29 to jump ahead to item 5.

5. Report from the Ministry of Education (9:29). The chair welcomed guests from the ministry and BCCAT:

Emilie Hillier, Exec. Director, Strategic Policy and Integration with the Ministry of Education.

Rob Hicks, Director of Postsecondary Transitions, Ministry of Education.

Lisa Marshall, Nick Poeschek, and Mike Winsemann (BCCAT).

Emilie Hillier share a PowerPoint presentation *K-12 Learning in 2020/21*, and stated “Given that next school year will not be entirely back to normal, due to COVID and the fact that students will be learning in a blended environment of online and in-person, we’d like the post-secondary perspective on priority learning for success in post-secondary.”

Some critical points from the presentation: In-class instruction was suspended mid-March, and the ministry has been working to ensure continuity of learning plans. Select students were invited back into schools, and voluntary and part-time classes restarted June 1st, although the focus has been mostly on younger grades. The progression is part of a five-stage reopening process, available on the ministry website (Stage five was the first step, and Stage 3 started June 1st). Stage 2 anticipated possibly in September, but it will be dictated by the provincial health officer, enabling an agile response to the virus next year. Given that there are questions about the preparation levels of the graduating class, there was a question posed: how can we support the K-12 system and grade 12 students preparing to transition to postsecondary study? Priorities were reinforced: support schools, provide districts with resources and information, address resources for the unique needs of grade 12 students, maintain high standards.

Discussion questions were provided: For postsecondary institutions, what would be priority learning for secondary and grade 12 students when they are in schools? How does this vary by institution? What needs to be considered, short and long term? How can we work together to ensure a smooth transition to postsecondary for grade 12 students?

Contact Rob Hicks 250-213-5314 Rob.Hicks@gov.bc.ca for questions about the presentation

The Chair opened the floor for questions on conclusion of the presentation (9:47)

Q: Ian Affleck. Concern about students arriving at postsecondary, perhaps not as well-prepared as usual. For example, students who took Precalculus 12 in Fall received the full course, but students who took it in Spring may have lost learning objectives. Is it possible for schools to consider math be taught when we are in Stage 1 of school reopening?

A: Emilie. As much as possible, staying in touch with the leadership in the school district will help to identify any local issues that arise, and this discussion is encouraged.

A: Lisa – note that the undetermined nature of the timeline makes planning difficult, as we don’t have a specific date when stage 1 may/will occur. We therefore need to keep the curriculum as flexible as possible.

A: Nick – the ministry doesn’t control the timetable, as this is a local decision which includes local

factors.

Q: Mateen Shaikh – if students are taking math in the spring semester, is there a standard across the province what any abridged learning objectives make look like? If there was a homogenous understanding of any abridged curriculum this would help the transition.

A: Emilie – there is an expectation that the full curriculum will be covered, and the changes are confined to format of delivery. Reframed question to focus understand what parts of the curriculum would be better delivered with varying format. What parts of the curriculum can be delivered online, and what parts are more critical in the classroom?

A: Lisa – not a consistent timing in terms of delivery, consequently the curriculum may be impacted by changing stages.

Q: Natasha Davidson. Is there any thought to effectiveness of assessment?

A: Emilie – formative assessments are assessing broader core competencies, and there isn't a simple answer to prioritization of learning objectives.

A: Nick – maintaining focus on students, and emphasizing the topics will vary from student to student is happening at the individual level.

Q: Susan Oesterle. How are summative assessments conducted, given online and unproctored exams are difficult to administer (suggesting F2F summative exams).

A: Emilie – online summative assessments have a 15 year track record, so there is a good level of comfort with the assessment process online.

A: Nick – not certain what the proctoring structure is.

A: Lisa – online assessments take place in a proctored (in person) environment where students are observed, and it is uncertain whether this will move to in-home exam. The long form, multi-step questions will help to ensure that students will have more difficulty seeking help.

Q: Kseniya Garaschuk. What consistency in the grading exists?

A – Lisa. This is similar to past years, as the individual schools can set their own assessment criteria.

Q: Andrea Hyde suggested students should be given computer usage training so that they understand what the online learning styles are, to provide competency and familiarity.

A: Emilie – this is something that has been reinforced.

Q: Justin Gray. Could you summarize some of the things that have been done to support teachers to remote teaching and assessment?

A: Nick – much of the local support has been varying, during the two-week pause between Stages 5 and 4. Variation in technology capabilities of individual students makes a blanket approach to all

impractical.

Comment: Natasha Davidson. We need to establish a culture of trust, and not to presume that students are always trying to cheat on exams. This represents a broader concern around the uncertainty of integrity

Comment: Mike Winsemann. Disappointed with the ministry approach to leave the online education of instructors to the districts. Recommend a coordinated approach to tools and training, as well as holding students accountable to poor practices online.

Response: Emilie – acknowledged difficulties in this transition time, and noted that there are colleagues in the ministry who are working to improve and support online, blended and remote learning for teachers, so there is work going on to address this point.

Comment: Natasha Davidson. More information about instruction and formative assessment in the online environment would be useful.

Response: Emilie – acknowledged concerns.

Comment: Bruce Dunham. Suggested that the ministry could help give teachers guidelines what to do, what is useful, and what are successful learning techniques.

A: Nick – there are members of the ministry working on more targeted professional support that would be resources. There is a challenge with the lack of central control.

Q: Ian: Could ProD days be used to help advertise and pass on guidelines in early September?

A: Nick – districts are individually ramping up preparations for teachers for the fall.

A: Emilie – the initial reactive situation is slowly shifting to more of a proactive stance, and the learning from the last few months will help inform the formats in the fall to pass on lessons learned.

The Chair thanked Emilie, Nick and Lisa for joining the committee, and closed the discussion. Emilie noted to contact Rob if there are any follow-up questions.

15-minute health break (10:34)

Reconvened (10:59). The chair asked those who hadn't been introduced to raise their hands, and after receiving the concurrence of Mike Winsemann, completed the introductions (item 4.1).

- 6. Report from BCCAT (11:05).** The Chair introduced Mike Winsemann, and thanked him for his attendance at the meeting. Mike presented several updates from BCCAT, presented in the following points.
- BCCAT has transitioned to working from home, which has impacted overall work priorities.
 - The ministry has been working with BCCampus, which has been taking some leadership such as producing a collection of online materials.
 - The Last 3 months have brought forth a few issues that should be considered, such as the impact of moving to a Pass/Fail competency grading system, or the impact of online labs?

- BCCAT has created a page on their website bccat.ca/systemnews entitled “Post-Secondary System News” which collects institutional updates, academic practices, and other information sources for one-stop guidance.
- Pass/Fail grading should not affect transfer credit, as a pass denotes competency which will be accepted for transfer; however, individual institutions will need to navigate any differentiation resulting from higher grades needed for admission or prerequisite purposes.
- Method of delivery should not impact awarding of transfer credit, although there is some discussion in other disciplines (such as chemistry) for credit transfer of online labs. There are no identified similar issues with math/stats courses.
- The Spring Update 2020 (on the BCCAT website) is a recent summary and contains informative updates on research and reports.
- Institutions are encouraged to look at the list of courses (also posted on bccupms website) that aren’t articulated to identify any gaps.
- Of the 65 articulation committees, about 1/3 have deferred meetings, 1/3 have met remotely, and the remainder have postponed until the fall for a virtual meeting.
- The JAM will be moved online this year, as an opportunity for a new format, and the agenda is in development. This may open up the meeting to a broader community, such as members of various articulation committees, improving accessibility.
- A List of active agreements (previously provided to the committee by the chair) was presented. This pointed out the looming challenge of maintaining transfer arrangements, and the need to for regular and cyclic review. The intent was to raise awareness about the importance of maintenance, with a goal of assigning direct credit where possible. Committee members are encouraged to look at the first- and second-year offerings to review those courses which haven’t been reviewed within the past 10 years.

Q: Ian Affleck. Is a course that articulates as 3XX considered articulated?

A: Mike – yes.

Q: Justin Gray. Does BCCAT recommend an end date for transfer agreements, and what happens at an end date?

A: Mike – end/expiry dates are not recommended, as the approach taken is that agreements are open-ended as a default position. However, this is a good point for discussion for improving the system to monitor dated transfer articulation agreements.

Q: Andrea Hyde. COTR seemed to not be on the list?

A: Mike – COTR is up to date.

Q: Deanna Baxter. If an institution reviews a transfer agreement, and decides it is no longer valid, does this get backdated?

A: No – the change will be going forward so that students in progress will not be impacted. Retroactive removal credit is possible, but frowned upon and only considered in specific circumstances. Note: It is the responsibility of the sending institution to send out updated course outlines, as the easiest way to update agreements. For clarity on the process, contact the articulation officer in your institution.

Q: Ian Affleck. What will the distribution list be for the report?

A: Mike – the registrars will be asked to contact individual departments to look at the approach needed. At this point, the intention is to raise awareness of the volume of outdated agreements.

Q: Ian Affleck. Can new courses be awarded articulation in arrears?

A: Mike – yes, and it does seem a bit odd, but a new course can articulate transfer from a sending course that predates the new course. Similarly, cancelled courses can maintain articulation for periods of time.

Q: Erin Beveridge – confusion with the internal discrepancy about the information that was reported within the institution. Is there any guidance about next steps?

A: Mike – UNBC has a 10-year review process, so referred any discrepancy to the institutional articulation officer to clear up any confusion.

Q: Eugene Belchev. Recommendations for next steps?

A: Mike – suggested reviewing the data and looking for gaps, or sections that should be rearticulated. Don't be concerned about the volume of the list, but reach out if there are concerns.

Q: Justin Gray. SFU has a course that will be renumbered. How do we ensure that this maintains articulation?

A: Mike – contact the articulation officer, and a course change can be implemented administratively.

Comment. Mike - Flexible pre-majors have been reviewed recently by BCCAT, as the maintenance of these agreements in general have been poor. As a result, BCCAT has stopped promoting FPMs as an option. These will be maintained if an articulation committee wishes, but the efficacy of the transfer product can not be measured. The mathematics FPM can be maintained if the BCcupms wishes to maintain it.

The chair thanked Mike Winseman for his input and representing BCCAT to the committee today.

11:55 Pause for lunch

7. Reports from BCcampus

7.1. Open Education Resources (1:03). The Chair welcomed Melanie Myers and Arianna Cheveldave from BCcampus, along with Clint Lalonde (project manager from BCcampus). Melanie presented “STEM Open Education Project” (30 slides). Content: Introduction to BCcampus, open education in BC, Zero Textbook Cost programs, OER and Math, and Adopting Open Resources. The BCcampus repository is available via opentextbc.ca, and at open.bccampus.ca.

<https://opentextbc.ca/oerdiscipline/part/math-and-stats/> or

<https://opentextbc.ca/oerdiscipline/part/math/> or

<https://opentextbc.ca/oerdiscipline/part/statistics/>.

Discussion: the chair noted the discussion in the agenda scheduled for day 2, and noted an open invitation to contact Melanie at mmeyers@bccampus.ca.

1:53 10-minute health break

7.2. WebWork (2:02) The chair introduced Clint Lalonde and Shirin Boroushaki, project manager with BCcampus. Clint and Shirin shared a 17 page presentation on Open Homework Systems, a project that Clint and Sharon have been working on over the past several months. Content: Open homework systems project, comparative analysis of platforms, discussion on everyone's experience, and potential next steps. Three major platforms were examined: WeBWorK, IMathAS (myOpenMath) and Numbas, and the current leaning is toward WeBWorK with two potential models under consideration (centralized shared service, and a decentralized institutional hosting). This was followed by specific questions and open discussion. The Chair thanked Clint and Shirin for their contributions.

2:59 10-minute health break

(3:08). The Chair welcomed BC teachers as special guests (Pearlanne Gray - Nanaimo, Katie Hays - Kamloops, Carol Funk - Nanaimo, Tanja Beeds - Kamloops, Ione Poelzer - Kamloops, Rich Balzer - Abbotsford) A short set of reintroductions of members from the committee was conducted.

8. Reports

8.1. BCAMT (3:17, Representative TBA) No report was available, although the chair will invite information via email.

8.2. BCSSMC (3:18, Suzanne Feldberg) The Secondary Schools Math Contest (BCSSMC) in April and May did not occur as it was scheduled due to the pandemic. Planning is underway to restart the contest next year. Suzanne provided a reminder that the website has a large repository of questions in the online databank. The chair reminded teachers of the two-round format of the initial round in April and a final round in May.

8.3. Math Challengers (3:21, Leo Neufeld) Leo shared a presentation as a report on Math Challengers, describing the MC format. Information is available at mathchallengers.ca. A written report was submitted to the committee, and attached as an annex to these minutes. Of note, although many local competitions were held in February, the provincial finals were cancelled due to the pandemic.

8.4. Calculus Challenge Exam (3:40, Wayne Nagata/Justin Gray). Justin provided the update that SFU has notified UBC that they will no longer be hosting the exam, and they will putting their effort into other outreach activities, as the number of students taking the exam was low (typically under 10 students per year). Wayne Nagata noted that the exam would still be continuing at UBC; however, it was cancelled this year due to the pandemic.

Q: Erin Beveridge. Will this be continuing?

A: Wayne/Justin thought that the exam will be continuing and recognized for credit, but will not be hosted in the future at SFU. UBC plans to continue hosting if possible.

9. Open Discussion (3:45). The chair welcomed the special guests to offer comments on the following subtopics

9.1. Impact of COVID-19 on 2019-2020 school year

Katie – her experience (in Precalc 12 second semester) was that there were big portions that she couldn't get to in the curriculum, so had to limit the depth of understanding. For example, trig identities and conics were introduced very briefly as the typical depth of knowledge was not able to be achieved.

Pearlanne – agreed with Katie, but noted that as there was a different order of topics, there may be variation from the schools.

Carol – the first semester (fall) students will be better prepared than the second semester. For example, conics and trig at the latter part of the course was limited.

Rich – concur with previous comments. Teachers tried to keep the curriculum going online (one-hour conferences, 4 times a week) and found the topic depth was limited. He anticipates that there will be a lot of review necessary in the fall for students continuing on. Expressed concern that the picture portrayed by the ministry is not his experience, and that learning objectives have been compromised due to the pandemic.

Carol – Report cards may include some information on which learning objectives were not covered, so this would help postsecondary institutions if this information is provided.

Q: Deanna Baxter – do the BC teachers have access to pre-designed online courses to help with the math curriculum?

A: Katie – as high schools all use different resources, and teach things in different orders. However, some skills may be increased and there are some positives, for example through the use of Desmos the visual appreciation of graphs may be increased. Individual help would be one way to mitigate, and specific bridging tutorials.

Pearlanne – prerecorded resources helped students as they could pause and rewind/review. Short videos will help learning online. Also, students have learned facility with videoconferencing, and uploading/manipulating documents.

Rich – commented on the advantages of students using recordings.

Ian – the creation of short videos will be a useful teaching resource for future teaching, and be a bit of a legacy teaching creation.

Carol – the district has done a good job given the circumstances getting teachers set up and supporting the education. But the teachers are all at different levels of capacity.

Mateen – anticipating that the fall teaching may also cause a similar lack of depth in the curriculum, would it be of benefit to describe which learning objectives are of more importance, and also would there be any assistance that postsecondary could provide? A: Carol – welcomed these ideas to help teaching.

Ian – perhaps we can look into previously completed surveys to solidify the more critical learning objectives in grade 12, and provide these to teachers (Leo noted that this document is in the BCcupms website)

9.2. Implementation of new curriculum in Grade 12, 2019-2020 (4:17)

Rich – enjoyed the new curriculum, and in particular was thrilled to teach conics again. Noted that the curriculum seemed to be very similar to the previous curriculum.

Andrea Hyde – noted that the prerequisite structure for high schools has changed (students could take grade 12 without formally having completed grade 11). Is this an issue?

A: Carol – prerequisites are still functionally in effect, which was the anticipated response from schools.

Ian noted that there could be local variation in this response, although it does seem a reasonable situation.

Q: Justin – has anyone offered any of the ‘new’ math courses?

A: Pearlanne – these were talked about, but so far nobody has run any of the courses.

A: Rich – similar, in that the Precalc and FOM courses still ran, but the new branches and options (for example, Statistics 12) were not offered.

Comment: Natasha – similar concerns exist around assessment and depth of learning objectives are being held. We must be more thoughtful and sensitive as educators to the background of students when we’re considering all courses (for example Calculus 1 to Calculus 2 transition).

Comment: Carol – Limited resources have also been a factor in considering to offer any of the new curriculum courses.

9.3. Further topics to be suggested by teachers and/or representatives (4:25) The Chair provided a final opportunity for any additional topics to be addressed. With none forthcoming, he thanked the

special guests for their time and insight

(4:26) The chair called a recess until day 2, and the committee members left the meeting.

THURSDAY, June 18th, 2020

(9:03) The chair shared the agenda for Day 2, opening the meeting by welcoming the participants

Gary MacGillivray asked that the agenda be reordered so that 10.2 is moved to the first item after lunch, and also requested summaries of the breakout discussions. These changes were accepted by the chair

10. Committee Business

10.1 Webmaster's Report (9:07). Ian Affleck (Webmaster) noted that most of the items of interest are in the news section which includes recent postings, and that no major changes have been made. Reminder to committee members to check their own institutional page under the "Members" link (insert link) to update their own information. Presentations supplied to the meeting will be added to the webpage. Ian volunteered to continue to maintain the webpage, although noted an open invitation to anyone who is interested. Attention was drawn to the "top 20 math proficiencies for calculus" which relates to the discussion from the previous day with the high school teachers present. Discussion around the content of this page ensued, with various questions related to its genesis, and related ideas.

Comment: Mateen Shaikh. Noted that the list (top 20) is very useful, and that he has used a small document at UofGuelph called a "mathematics survival kit" which includes specific examples that would be useful to supplement the online priority list. The chair asked if this was available as an OER, and Mateen noted that it was probably not, given that this was a dated document produced locally in print.

Comment: Gary MacGillivray. He has created a collection of online materials which he'll make available.

Comment: Erin Beveridge noted the useful website 'mathematicssurvivalkit.ca'

10.2 Report from Nominating Committee and Elections (9:21) item postponed

10.3 Proposed agenda items for 99th meeting: Camosun College, May 18-20, 2021 (9:21) The Chair opened the call for agenda items, acknowledging that the current pandemic response may guide our agenda development further and bring forth priority items. Gary MacGillivray suggested a review of online delivery models, and lessons learned from this year online (university delivery modes update), as well as a discussion on how the transition from high school went, how it may go in the future, and how we may wish to accommodate this. Suzanne Feldberg noted that there were some previously suggested agenda items that were postponed and should now be considered for inclusion.

10.4 Proposed location for our 100th meeting (9:27) The chair called for a volunteer to host the 100th meeting in 2022, adding that it would traditionally be held in the lower mainland. Natasha Davidson suggested Douglas College may be an option. Bruce Dunham thought it should be at UBC, and is working with Wayne Nagata to see if UBC can be explored as an option. The chair noted that it would

be a possibility that future meetings could be held in a format which includes a videoconference capability to include additional interested representatives. The chair asked Natasha Davidson if Douglas College would be OK yielding the suggestion to UBC, and this was accepted quite readily.

10.2 Report from Nominating Committee and Elections (9:32) Suzanne Feldberg explained that this item was completed outside the meeting time, as the vice-chair sent an email Tuesday evening to the mailing list, forming a nominating committee by volunteer with Gary and Susan O and Suzanne: position Vacancies: Chair, and Secretary. Suzanne described the secretary duties.

10.5 List Updates (9:36) The Chair provided a reminder to committee members to ensure that their information on the website is current, and to contact Gary if you would like to be on the mailing list. Math for Elementary Education – contact Susan Chen. Andrea Hyde is also trying to start a forum for elementary education and in particular how to approach distance learning aspect. Leo noted that in the past we had membership from the Mathematics Education group in various faculties in Education, and thought it may be useful to re-establish this link. The chair will look into reaching out to those faculty.

11. Matters Arising from 97th Meeting

11.1 Flexible Pre-Major (9:40) The chair invited Gary MacGillivray to assist with providing background information. BCCAT asked us to look at the FPM as to revision, amendment, cancellation. A committee was formed to make a recommendation, but in the interim BCCAT has cancelled their support of the FPM, making the response to BCCAT moot. Notwithstanding this, there is a proposal to change the link on the BCCAT webpage to our own, where a list of courses needed and offered would be provided as an aide to students.

The subcommittee noted that a common FPM was not a realistic curriculum in the province, so rather the idea of a resource page of the courses would be more useful. The information would need review.

Motion: To create an advising resource on the BCcupms webpage which would provide the entry level course requirements for entry level into the degree granting institutions math major programs. Non-degree granting institutions could provide, if desired, links to the transfer guide to course equivalents. M: Gary MacGillivray, S- Ana Culibrk

Discussion. Justin Gray asked to amend the motion to rephrase entry level as “lower division”. Ana Culibrk asked to expand the terminology to ‘bachelor degree’. Justin Gray noted that BCCAT would provide a link to the page if the FPM information is provide.

Revised Motion: To create an advising resource on the BCcupms webpage which would provide the lower division course requirements for entry level into the Bachelor degree granting institutions’ math major programs. Non-degree granting institutions could provide, if desired, links to the transfer guide to course equivalents. M: Gary MacGillivray, S- Ana Culibrk

Approved – 26 in favour, 0 opposed, 2 abstentions

10:01 health break

12. Math Breakout Discussion. (10:11) The chair invited introductions, proceeding through the attended list.

12.1 Core Calculus Survey. (10:20) The Chair provided a background on the surveys, acknowledging Ana, Justin and Wayne Broughton for their work. Since January, the Core Calculus surveys and reports have been posted on the BCcupms website, along with the survey results. Michael Nyenhuis spoke to the survey, describing the survey questions that were submitted. Responses tended to be either core or not required, and there were very few optional learning outcomes, which provided a good list of suggested learning outcomes. There were some differences with Vancouver Island and those institutions close to the AB border, where some integration was included in Calculus 1, which was a bit atypical. The Social Science / Business Calculus course was far more varied as this isn't a course which is as common (only 14 business calculus responses were received). Due to the lack of curriculum clarity, and institutional variability with business programs, there wasn't any readily available conclusions to create a core curriculum.

Comments: Justin – the intent of the report was to serve as a guide to institutions who are creating or revising Calculus courses, and that this will help for future transfer articulation.

Eugene – there is a distinction with business calculus and social/life science calculus. At Langara, both courses are offered, as the courses are tailored to the interests of students who are in the different pathways (commerce, economics, etc.) although the flavours are similar.

Justin – the applied calculus courses are often treated differently at the degree granting institutions, from generic equivalency to lower division course streaming. This may cause difficulties in creating a common core curriculum for these types of courses. The Chair gave a similar example existing at UFV.

Kseniya – Should the documents be advertised for high school teachers? This may be a useful document to help advertise the important learning outcomes, as well as the variation across the universities. Suggested that the survey be made available to BCAMT, for example.

Asia – concurred with the wide circulation. Concerns around the appearance of such a report, as if it looks like a data list it may not be quickly comprehended (the format is important). Another note is that core competencies are very technical, and discipline specific, but the wider proficiencies (such as critical thinking) are not discussed which will be important for teachers to connect to.

Justin – The survey did include some more general proficiencies, which are listed earlier in the report, so perhaps these could be rewritten into anything that is advertised broadly. Asia clarified as to the first list which can be confusing as it does not include all of the broader learning outcomes.

Chair – we do need to be thoughtful around the diplomacy, respecting the authority of the ministry to set the provincial curriculum for K-12.

Suzanne – Personal experience that students who are taking calculus in high school can often miss some fundamental learning objectives. Similarly, students were observed taking the IB program without taking Precalculus, which seems quite surprising.

Andrea – Noted that the online teaching format lends itself more to investigating deeper learning skills as they are harder to fake for students than technical skills.

Deanna – Could we communicate the depth of knowledge rather than the technical skills needed? The main concern is not the content as such.

Natasha – We need to be conscious of the relative similarity for the high schools between all levels. There is probably a more serious question about evaluation and assessment to ensure that students are properly prepared for next steps.

Erin – teachers have expressed an interest in seeing this information, so we should not be too concerned over possible reactions from the ministry. The Chair noted that the information would be through a local and low-level connection.

Chair – Calculus 12 was a locally developed course, and although in some cases this may have given students a false sense of confidence, there were some cases where it was useful for student progress. Some history for using Calc 12 as an indicator of success

Mateen – Reframed the issue with students who arrive with individual skills, but haven't seen well-developed critical thinking skills.

Kseniya – We need to acknowledge what the reality is, and that the list is aspirational.

Justin – It's important for institutions to point out the differences between Calculus 1 and Calculus 12 so that students have an understanding.

Andrea – announcement: trying to get a conversation going around the math for teachers course, and is working with Susan Chen to create an email list. If anyone is interested, please reach out to either Andrea or Susan.

13. Stats Breakout Discussion. Minutes (by Michael Lo) are included at the end of this document.

12:08 pause for lunch

1:09 Chair resumed after lunch break. An informal summary of the Math breakout discussion was presented by the chair, who described the discussion annotated above in the minutes. Bruce Dunham presented a summary of Stat the Breakout session, including: Statistics 12 course is being supported by faculty, naming of departments at Camosun College (Economics department using the name Statistics) which is well resolved, articulation guidelines were discussed, Data science courses, being relatively new, were discussed with a view to articulation and possible new course proposals, discussion and sharing of challenges with teaching statistics courses online, and resources, and election of the chair with Bruce Dunham re-elected by acclamation

An update from the nominating committee was provided by Suzanne Feldberg, resulting in two calls for nominations.

1. Call for nominations for the Secretary. After three calls, the sole nomination was Costa Karavas, who was thereby acclaimed. It was noted that the term is one year, to realign the terms with the standard two-year cycle.

2. Call for nominations for the Chair. After three calls, the sole nomination was Ian Affleck, who was thereby acclaimed for a second term.

14. Online Delivery – Open Discussion (1:23) The chair introduced the topic for discussion, and called for ideas and suggestions for techniques and tools for content delivery online.

Comments:

- Justin Gray. The flipped classroom with recorded video lectures was used for Calculus 2, and worked well. Intent to use iclicker cloud for the synchronous meetings. Open tutorials initially used Blackboard collaborate, but will be moving to Zoom. Continued with individual homework.
- Ian Affleck. Used a document camera to write via blackboard collaborate ultra, with the technique of joining as a student in addition to the instructor to help with understanding the view.
- Wayne Nagata. Q: Why switch from Collaborate to Zoom?
A: Ian noted that Zoom does everything noticeably better, with better band width, more people (25) as opposed to a max of 4 in BB collaborate, and other aspects.
Kseniya noted that Collaborate has kicked people out more often, and also has issues with audio that has caused students to need to rejoin.
Chehra Aboukinane – moving to zoom next term.
- Kseniya Garaschuk – Some institutions are using MS Teams. Has anyone used anything else?
- Andrea Hyde – using MS Teams hasn't been great, and is considering using zoom despite the concerns around student privacy.
- Suzanne Feldberg – Zoom is not supported at TRU (and ITS has recommended not to use it).
- Jane Butterfield– Uvic has acquired a license for non-free zoom.
- Simin Jolfaee– at BCIT, Zoom has been connected with their LMS; although there seem to be concerns about privacy so it is not certain that this will continue.
- Asia Matthews – Shared whiteboard survey in the US has recommended Limnu, which is an infinite and collaborative whiteboard.
- Jeffrey Ha - Uses a series of blank powerpoint slides that can be written on as an infinite whiteboard, although this isn't a collaborative tool. Limnu and Microsoft Whiteboard allow zooming out/in. MS Whiteboard files are typically very large and unwieldy in some cases due to size limitations (15 MB, for example).

The chair introduced a second topic for discussion: How do we engage students and encourage interaction, and what approaches are most useful?

- Andrea Hyde. Smaller breakout groups (3-5 people) tend to create more natural situations for conversations.
- Asia Matthews: a shared, anonymous whiteboard helps to draw out students who may be a bit shy about asking questions. Another tip is “Peruseall” Peruseall is a technology for interactive shared reading and commenting - useful for facilitating discussions.
- Bruce Dunham. Posting a question, and putting students into small breakout rooms with the task to come up with an answer and an explanation to spark discussion. One of the rooms will be called at random (or seemingly at random) to perhaps motivate the students to explore the topics.
- Kseniya Garaschuk. A whiteboard of sorts is essential so that students can describe and draw mathematics. Some training in use of the digital whiteboard can provide an environment which students will use.
- Justin Gray. Going to try weekly problem-solving sessions with small groups of students, moving from an existing model of in-person workshops.
- Eugene Belchev. For live ‘lectures’, invite students to participate so that they’re on the screen and more vested in the experience. Caution about keeping these short.
- Jeffrey Ha. Thoughts about office hours to support students, and keeping available outside of class as ways to support student engagement by building 1:1 connections where possible.
- Stephen Brown. Discord is a good tool for office hours (similar to slack). Mattermost is an open source platform that you can use through Open ETC in BC.

2:04 10 minute health break

15. Online Assessment & Academic Integrity (2:15) The chair invited an open discussion about academic integrity and approaches to assessment. Question: what worked better than they thought it would?

Comments:

- Wayne Nagata. Had an exam, where it was open-sourced, and open book. Curiously, the marks were very low. The key is to design questions that aren’t easy to look up.
- Lisa Marshall. Making things open book seem to help, perhaps advising students to prepare a formula sheet, which helps with studying.
- David Bigelow. Exam-based system can lend themselves to more stressful (and create more allure) of cheating. More detailed, takehome assignments are hopefully more useful.

- Chehra Aboukinane. Multiple types of assessment seem to be helping: diversifying types of assessment (group testing, randomization, project/application based, etc.) will help give a sounder basis with which grades can be calculated. For example, Kahoot helps to increase engagement.
- Jeffrey Ha. Remember that students may not have a comfortable situation at home, and may have difficulty juggling micro-assignments. Suggest to take a quick survey or poll to make sure that we are not overly disadvantaging students by increasing the number of connection points.
- Erin Beveridge. The situation of the employee strike at UNBC caused a similar situation (an abridged semester). One idea that helped was creating an online calendar for the students, and adjusting the length to a maximum of 2 pages (single pdf) for max 30 minutes.
- Justin Gray. Reduced weighting on final exams (more frequent assessments), avoid questions that could be easily searched for online, multiple versions of exams, students handwrote and scanned/submitted exams (scan of ID card at the start page to confirm identity). Questions not necessarily more difficult, but a bit less standard in language to make searching less likely. Breaking exams into shorter pieces. SFU examining live proctoring over zoom with mobile phones on a side view, and are working on guidelines for the fall.
- Natasha Davidson. Concerned that live zoom proctoring is an invasion of privacy, so there are concerns here, and is surprised that any student would be accepting of this type of a situation.
- Stephen Brown. Multiple versions, students scan and submit pdf. Shared <https://www.gradescope.com/>
- Asia Matthews. Oral exam/interviews are an option for smaller classes.
- Mateen Shaikh. Presentations may be worth a portion of the assessment.
- Eugene Belchev. Implement online testing, with a limited amount of time to pause for each answer, as well as randomization.
- Peter Sinclair. Chegg was used extensively, and it was useful to pursue it after the fact, from an accountability perspective. Questions need to be uniquely identifiable (with some element of randomization) to do this well.
- Justin Gray. SFU Academic integrity coordinator has been able to get information from Chegg.
- Susan Oesterlie. Deterrence was useful to tell students in advance to avoid cheating.
- Kseniya Garaschuk. Preventing cheating is more useful (3 factors: pressure – what are the stakes, opportunity – is it easy to do, rationalization – is it ok to cheat?) Discuss with students what cheating

is, and not just read them an honour code. Considering these three factors will help prevention.

- Chehra Aboukinane. Reserve the right to immediately suspend an exam on the instructor's decision to move to an oral exam. Be clear about the rules, and follow-up with students who stepped outside these.
- Deanna Baxter. All exams are open book and open notes, as this is extremely hard to police. Post-exam follow-up interviews to review the exam. Ask students to scan and submit all of their work (even for multiple choice).

16. Adjournment. (3:08) The Chair thanked everyone for their participation, and appreciated the honour of continuing as chair. Special acknowledgement was noted for Jane Butterfield for the outstanding service as secretary.

Motion: To adjourn the 98th BCcupms meeting. M- Suzanne, S- Natasha. Consensus.
Approved - consensus

Meeting adjourned at 3:10.

Attendee List

Institution	Last name	First name
Acsenda School of Management	Aboukinane	Chehra
	Banerjee	Partha
	Mahyari	Zahra
BC Institute of Technology	Jolfaee	Simin
	Merchant	Sandi
Camosun College	Chen	Susan
	Montgomery	Patrick
Capilano University	Anderson	Marsha
	Ottaway	Paul
College of New Caledonia	Wall	Tracy
College of the Rockies	Hyde	Andrea
Columbia College	Culibrk	Ana
Coquitlam College	Belchev	Gera
Douglas College	Davidson	Natasha
	Henschell	Dan
	Oesterle	Susan
Fraser International College	Alaei	Navid
Kwantlen Polytechnic University	Macleod	Colin
	Nyenhuis	Michael
Langara College	Belchev	Eugene
	Lo	Michael
North Island College	Cameron	Jeannie

Northern Lights College	Cui	Hongbin
Okanagan College	Brown	Stephen
	Hurtubise	Claude
Quest University	Matthews	Asia
Selkirk College	Henderson	Doug
Simon Fraser University	Gray	Justin
	Perera	Harsha
Thompson Rivers University	Boroushaki	Shirin
	Feldberg	Suzanne
	Rahmati	Saeed
	Rollans	Shane
	Shaikh	Mateen
Thompson Rivers University – OL	Pardoe	Iain
Trinity Western University	Pimentel	Sam
University of BC Okanagan	Broughton	Wayne
University of BC Vancouver	Dunham	Bruce
	Nagata	Wayne
University Canada West	Ha	Jeffrey
University of the Fraser Valley	Affleck	Ian
	Garaschuk	Kseniya
University of Northern BC	Beveridge	Erin
University of Victoria	Butterfield	Jane
	MacGillivray	Gary
Vancouver Community College	Karavas	Costa
Vancouver Island University	Bigelow	David
	Slonowsky	Dean
Yukon University	Semple	Jaclyn
Undetermined/Retired	Hosseini	Amir
	Neufeld	Leo

98th BCCUPMS Meeting Statistics Subcommittee Meeting Minutes June 18, 2020

Venue: Zoom online meeting

Time: 11:00 am to 12:15 pm

Present:

Chehra Aboukinane (Ascenda), Ian Affleck (UFV), Mahshid Atapour (Capilano), Stephen Brown (Okanagan College), Susan Chen (Camosun), Bruce Dunham (Chair, UBC-V), Dan Henschell (Douglas), Simin Jolfaee (BCIT), Zahra Jiwani (Ascenda), Costa Karavas (VCC), Kevin Keen (UNBC), Mary Lesperance (UVic), Michael Lo (Secretary, Langara College), Colin Macleod (KPU), Harsha Perera (SFU), Sam Pimentel (TWU), Shane Rollans (TRU), Mateen Shaikh (TRU), Peter Sinclair (Capilano), and Dean Slonowsky (VIU)

1. Approval of Agenda
 - The Chair added an item about the Statistics Subcommittee Chair Election after Item 6.
 - The approval of the modified agenda was moved by Susan Chen and seconded by Dan Henschell.
2. Approval of Minutes from Statistics Subcommittee Meeting from 97th Meeting
 - The approval of minutes was moved by Chehra Aboukinane and seconded by Costa Karavas.
3. Matters Arising from Minutes
 - Item 5 (High School Statistics 12) was brought up for further discussion. We are encouraged to have a chat with local high school. Susan did contact some school teachers but did not get any response. The Chair suggested to contact BCAMT (BC Association of Mathematics Teachers) for the reaching out. He also shared his experience with high school teachers near UBC-V.
 - Item 6 (Open Access Resources) was also brought up for further discussion. There was encouragement to register for StatSpace (<https://statspace.elearning.ubc.ca/>) as instructors to get access to extra resources.
 - Item 9 (Camosun Department Name Change) got updated. Camosun Dean and VP believe the name would be reverted back, but it is not confirmed yet. Susan is appreciative about the support this group has provided.
4. Block Articulation of Statistics Courses
 - The Chair mentioned that UBC-V would try to avoid unassigned science credits as it creates more anxiety among students and more work for the faculty.
 - If one-to-one does not work it is highly encouraged we consider doing “block transfer” of sets of courses, where appropriate.
 - Courses should ideally be under the same subject code (like MATH or STAT).
5. Articulation of Data Science Courses
 - UBC-V has been running DSCI 100 (Introduction to Data Science) for about two years. It only has MATH 12 as pre-requisite.
 - There will be a new second year Data Science course (STAT 201) with DSCI 100 as pre-requisite. STAT 201 has similar content as STAT 200 but with more Data Science favour.
 - DSCI 100 and STAT 201 will be part of the Statistics major in the future. They also form part of the Data Science minor.
 - The Chair encouraged others to consider creating data science courses and establishing transfer credits.
 - TRU has a Master of Data Science and they are planning to roll out a few 1-credit lower division courses. It is believed that it might be hard to articulate one-for-one.
 - Interested parties were invited to contact the Chair for more information about DSCI 100 or STAT 201.
6. Teaching, Assessment, and Resources for Online Learning in Statistics (Susan Chen, Camosun)
 - Susan asked if there were any recommendations in online teaching Calculus-based Introductory Statistics.
 - Mateen was planning to have more low-stake project-based assessments.
 - Andrea was planning to introduce more statistical thinking in the assessment, ask students to bring in statistics-related things happening around them. Grades will be based more on collaboration and presentation.

- Kevin Keen used proctored exam in undergraduate courses. He also used multiple choice questions in lower-division courses on Blackboard.
 - The Chair shared his experience with WeBWork and encouraged others to explore it.
 - Zahra tried an assessment with an online part and a hard-written part.
 - Susan shared with us that 80% surveyed students wanted to have asynchronous classes.
7. Election of the Statistics Subcommittee Chair
- The two-year term of the Statistics Subcommittee Chair for Bruce Dunham is up.
 - He was willing to stand for election again but also welcomed others to participate.
 - Bruce was nominated by Susan and seconded by Costa.
 - Bruce was the only candidate and he will the Chair for another two years by acclamation. (Voting: 16 Yes, 2 Abstain, and 0 No)
8. Any Other Business
- Articulation agreement will be kept intact during these times.
9. Motion to adjourn
- Susan Chen moved to adjourn and seconded by Dan Henschell