GROWTH & GOALS

A module to help students take greater ownership of their learning

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uOttawa

Goals for today's session

Introduction

The Module

The Evaluation

Interested in using the module?

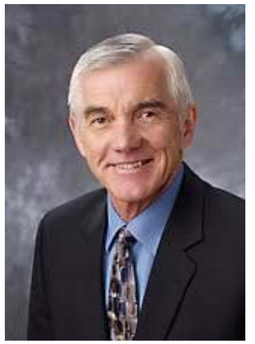
1 – 4 hours
Adapt existing template
No major course changes

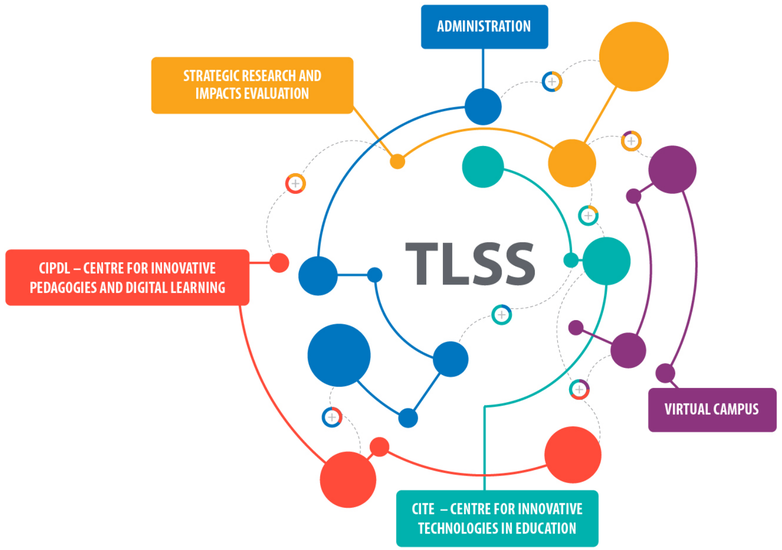
Instructions and
support provided

Results export
to spreadsheet

Reuse in
future years

Students are key members of the development and evaluation teams





FRG
FLYNN RESEARCH GROUP

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Why create the module?

Students need to:

- Know and continually monitor their learning (UDLE 5)
- Develop autonomy and professional capacity skills (UDLE 6)

However, most programs, courses, and online resources do not address or teach such skills

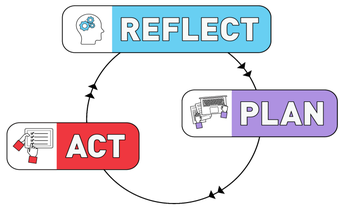
UDLE = Undergraduate Degree Level Expectation

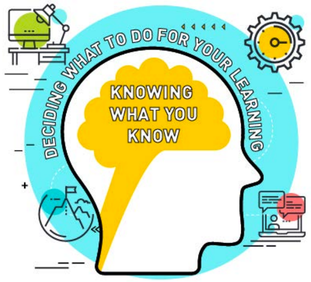
We set out to address three problems

Managing multiple course and life goals and demands

Dealing with failure

Identifying what you need to learn and how to get there





Self-Regulated Learning (SRL)

Growth Mindset

Metacognition linked to learning outcomes

Integrated in courses

Module's structure

Start of course: Learn concepts, reflect, plan

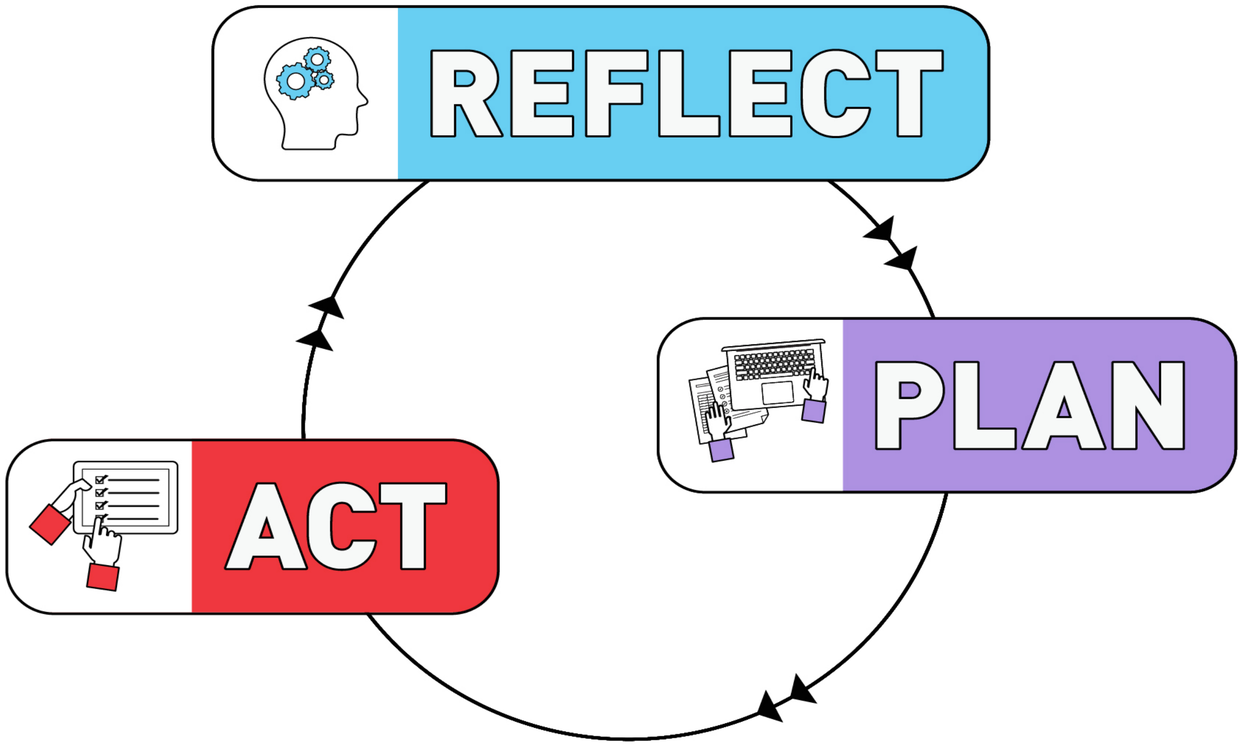
Check in before/after assessments

Wrap up and next steps

Piloted in 5 courses (year):
general chemistry (1), calculus (1),
biopharmaceutical sciences (2), organic chemistry (2),
education (grad)

Self-Regulated Learning (SRL)

Taking control of your thoughts and actions to attain goals



Growth Mindset

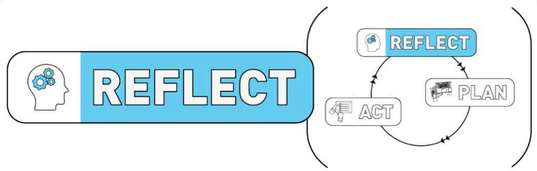
Abilities and knowledge can improve with effort, support, and strategies.

Failure is an opportunity to learn.

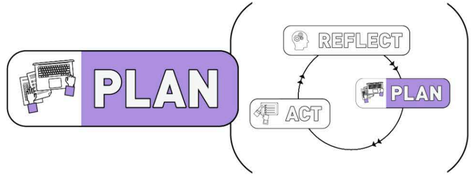
Abilities and knowledge are pre-determined

Failure shows the boundaries of abilities

Dweck, C. S. Mindset: The New Psychology of Success; Gildan Media Corp, 2007



Metacognition



1. Decide what you know and what you don't know about the course's learning outcomes.

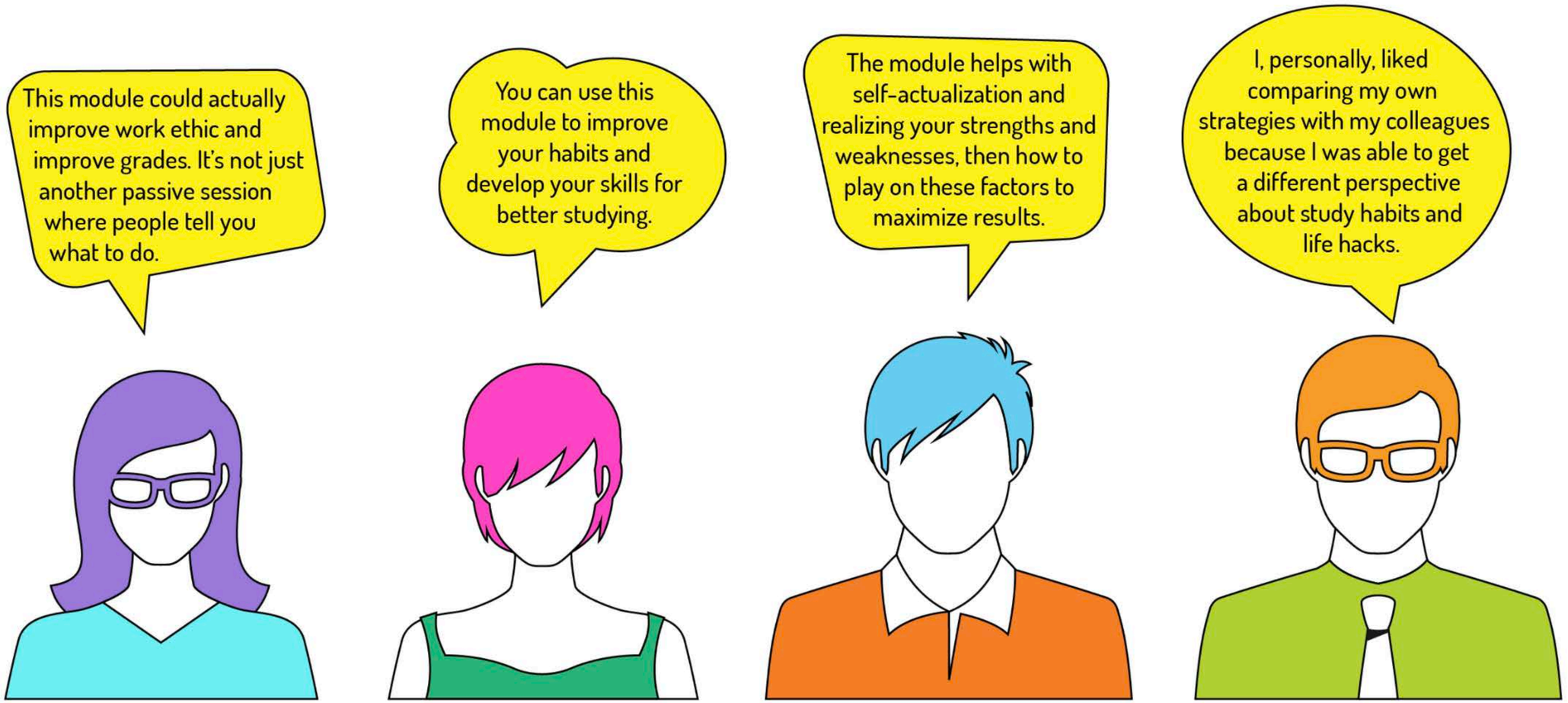
2. Decide what you need to do for you learning.

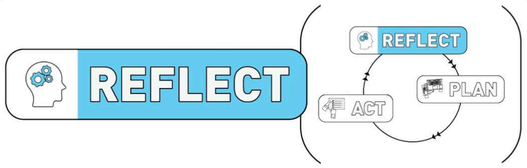
Welcome

WHAT IS SELF-REGULATED LEARNING (SRL) AND WHY SHOULD I USE IT?

> Self-Regulated Learning is the strategic control of thoughts, actions, and motivations to **achieve personal goals** and adaptively respond to environmental demands.
>
> — Zimmerman, B. J. *Am. Educ. Res. J.* **2008**, 45 (1), 166–183.

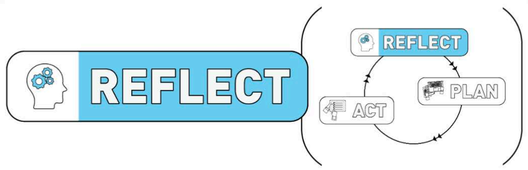
Starting off with SRL
Welcome





Meet Tracy

Meet Tracy, who is about to write her Organic Chemistry II final exam. She's having a hard time, but this module could help her!



Which statements have been true for you?

Does not plan out her study time

Crams for a few hours before the exam

Cannot gauge her academic preparation accurately

Thinks she's not good at this subject

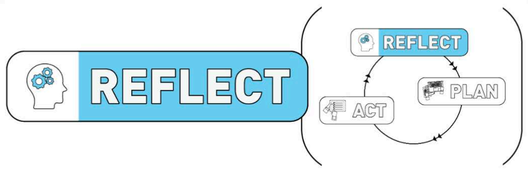
Very defensive about her study methods (they worked in high school!)

Does not ask for help

Is afraid of looking stupid

Doesn't find extra materials because she already has too much to learn

Has little self-confidence for achieving success



Identify learning myths

1) When it comes to learning, metacognition (*i.e.*, thinking about thinking) can be just as important as intelligence. [2]

- True
- False

2) A student's failure to learn is due to their limitations in intelligence.

- True
- False

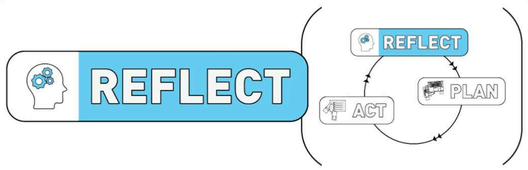
3) The professor is responsible for teaching me and making sure I learn.

- True

There are many things you can do to improve your learning. Find out more about specific things you can do in this module.

- ✓ False

2. Dweck, C. S. *Mindset: The New Psychology of Success*; Gildan Media Corp, 2007



What mindset do you have about this course?

Question 1

Read each statement and decide to what extent you disagree or agree with it.

#	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	My ability in this subject is something I cannot change.					
2	When a problem gets really hard, I give up.					
3	I feel smart when I can easily figure out a problem.					
4	I feel smart when I can figure out a hard problem.					

Dweck, C. S. *Mindset: The New Psychology of Success*; Gildan Media Corp, 2007

Explaining Growth and Fixed Mindsets

"Mindsets are beliefs – beliefs about yourself and your most basic qualities and abilities."

WHAT IS A GROWTH MINDSET?

"People believe their most basic abilities and qualities can be developed and cultivated through dedication and hard work. Brains and talent are just the starting point. This view creates a love of learning and a resilience that is essential for great accomplishment. Virtually all great people have had these qualities."

WHAT IS A FIXED MINDSET?

"In a fixed mindset, most people believe their basic qualities, like their intelligence or talent, are simply fixed traits. They spend their time documenting their intelligence or talent instead of developing them. They also believe that talent alone creates success–without effort. They're wrong."

Dweck, C. S. *Mindset: The New Psychology of Success*; Gildan Media Corp, 2007

Explaining Growth and Fixed Mindsets

https://www.youtube.com/watch?v=M1CHPnZfFmU&feature=youtu.be

Dweck, C. S. *Mindset: The New Psychology of Success*; Gildan Media Corp, 2007

The importance of failure

SUCCESS COMES THROUGH EFFORT AND FAILURE

As you watch the video, consider the ways you can relate this famous failure to your own experiences with effort, failure and success.

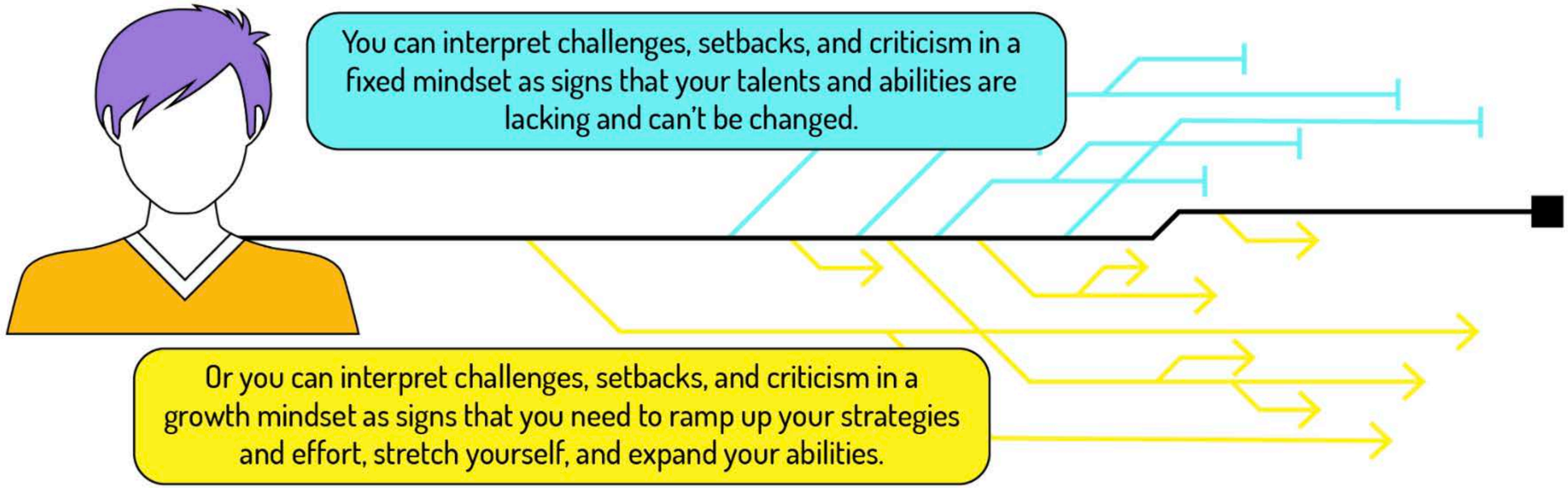
https://youtu.be/t7oyP-Wm9Iw

You can watch more inspiring videos about the amount of effort and failure it can take before achieving success or continue on with the module.

Failed rocket launches: https://youtu.be/RY1cEOzaf78

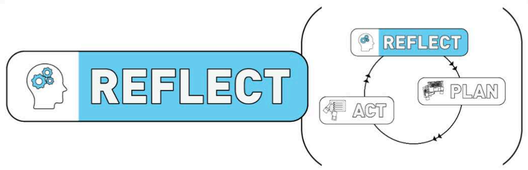
Changing your fixed mindset voice

How you interpret challenges, setbacks, and criticism is your choice.



So as you face challenges, setbacks, and criticism, listen to the fixed mindset voice and...

Changing your fixed mindset voice



Reflecting on values and motivations

Question 1

What really matters?

What's really important to you in your life?

Spend 5 minutes writing your answer (not shared with anyone else).

Can include anything! Big, small, dreams, etc.!

Question 2

Why am I taking this course?

How does this course fit into your life? Career, interest, program requirement, other...

What's important to you about this course?

What would success in this course look like to you?

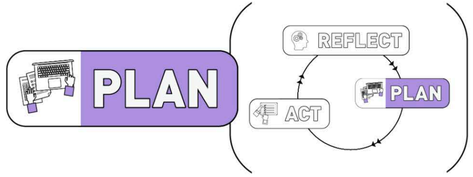
How important is that success to you?

Question 3

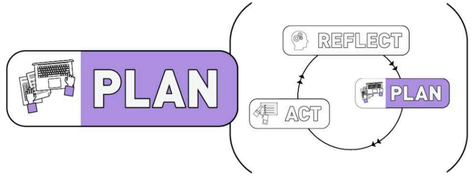
Thinking back...

Take 5 minutes to write down everything you can think of about how your last semester went (and years, if you want). Only you will be using this reflection - it won't be shared or handed in.

- What went well?
- what went poorly?
- What are you proud of?
- What do you regret?
- What helped you succeed?
- What barriers or events hindered you?
- What external factors affected you?
- Anything else you can think of?

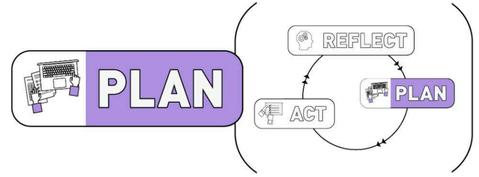


Plan phase: values, priorities, goals

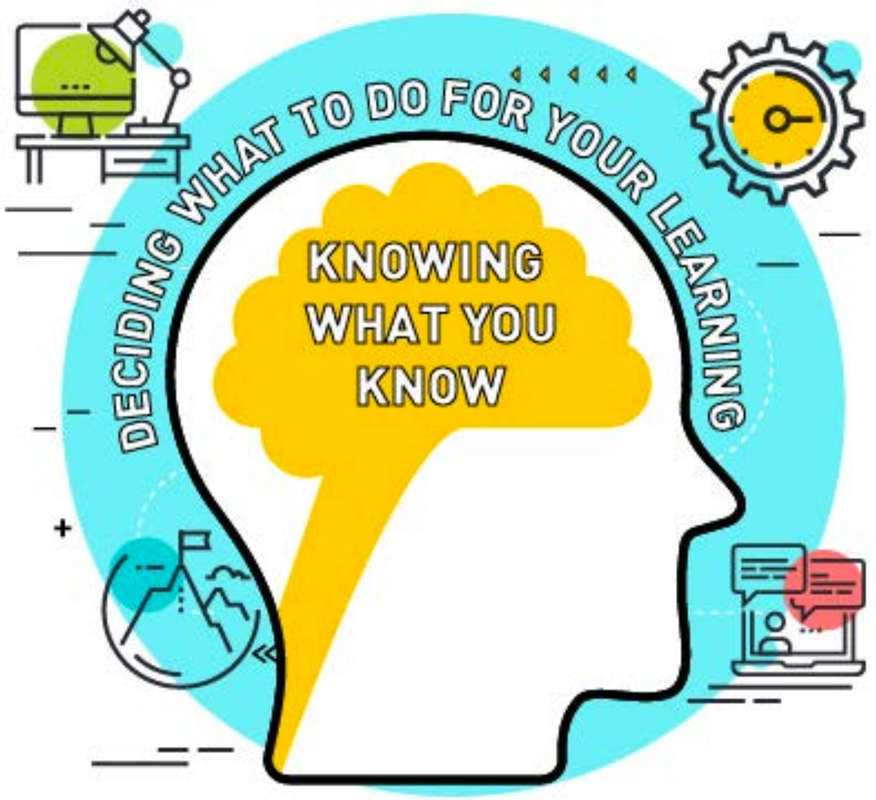


Identifying and setting SMART goals

Specific	• Try and make your goal as precise and defined as possible
Measurable	• Establish a criteria to measure your progress • How will you know when you are on your way?
Accountable	• Determine a person who will help you and keep you responsible for your goals
Reachable	• Set reachable goals that you will be able to attain (high expectations are good) • Set small goals toward bigger goals
Time specific	• Create a timeline • Having an end time will help you stay accountable to your goals

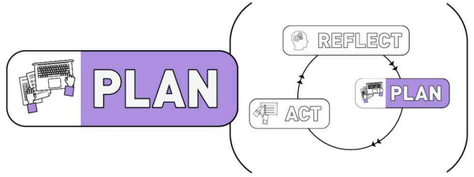


Metacognition
Knowing what you know and working accordingly



At this early stage in the course, you'll identify how well you know the prerequisite knowledge and skills for this course. Your professor has created this list of skills with the help of former students.

Here is the full list of LOs as a reference: Learning Outcomes for CHM2120A.pdf



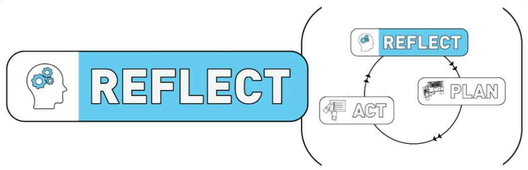
Metacognition
Rate your abilities on the **Intended Learning Outcomes**

Question 1

Rate your knowledge or skill at the following, with 1 being lowest ability (not able) and 10 being highest (mastery).

#	Statement	1	2	3	4	5	6	7	8	9	10
1	Quickly (<5 seconds) calculate the formal charge on an atom	○	○	○	○	○	○	○	○	○	○
2	Quickly (<2 seconds) indicate the direction of a dipole (δ^+, δ^-) of any bond.	○	○	○	○	○	○	○	○	○	○
3	Quickly (<10 seconds) draw a Lewis structure if given a line structure and vice versa.	○	○	○	○	○	○	○	○	○	○

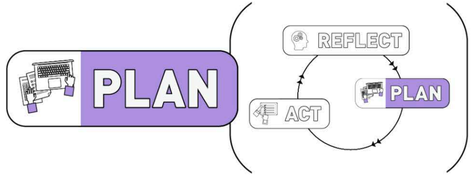

Handout



Identify growth mindset statements

1. ☐ My ability in this subject is something I cannot change.
2. ☐ When a problem gets really hard, I give up.
3. ☐ I feel smart when I can easily figure out a problem.
4. ✓ I feel smart when I can figure out a hard problem.
5. ✓ I get help when I get stuck on a problem.
6. ✓ I like to learn from my mistakes.
7. ☐ I feel smart when I don't make mistakes.
8. ✓ I will work on a problem for a really long time until I figure it out.
9. ☐ I'm not an organic chemistry person.
10. ✓ I like to figure out new subjects that I'm not good at yet.

Dweck, C. S. *Mindset: The New Psychology of Success*; Gildan Media Corp, 2007



Metacognition
Start to plan

Question 2

Ready to improve your knowledge and skills? Next we'll look at specific study strategies to help you get there.

The word "study" can mean different things to different people. Check off the five most common things from this learning (study) techniques questionnaire that you do when you are learning (e.g., preparing for an exam).

- [ ] Write down my goals where I can see them
- [ ] Make a to-do list
- [ ] Make a study schedule
- [ ] Test myself with past exams

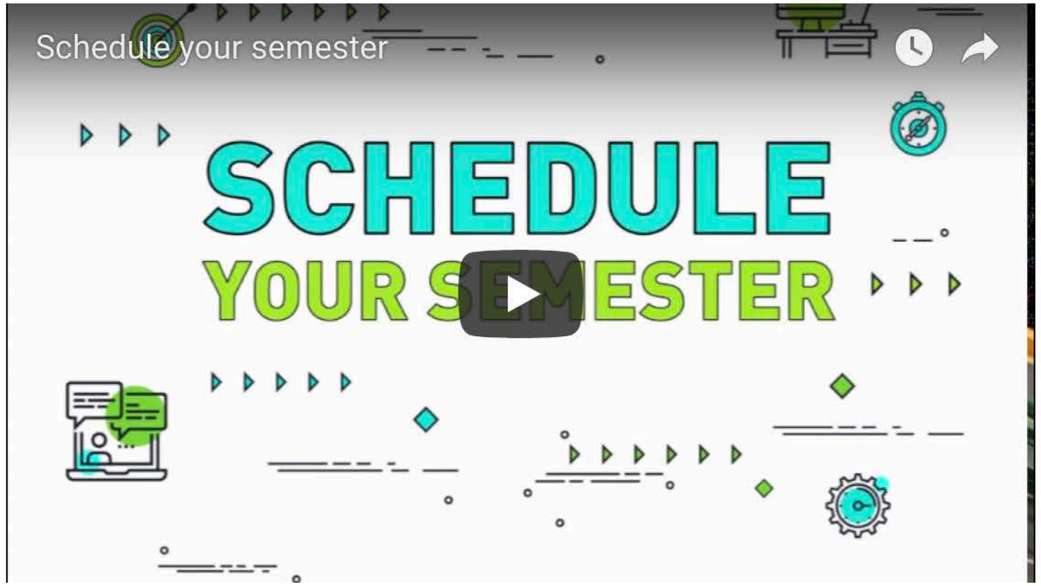
Question 3

Now that you've looked at the Prerequisite Learning Outcomes for this course and learned about effective study strategies, take some time to write down what you'll do to improve your knowledge and skills with regard to the LOs you gave a lower rating to.

Planning your time

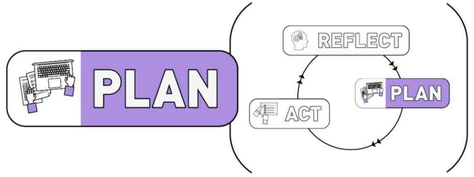
Watch Shaina schedule her semester:

Transcript (.pdf, 125 kb)



You can use whatever technology you wish to do this, such as the calendar on your phone, software such as Asana, scheduling software, etc.

Take some time to plan your semester now and put your schedule somewhere that you'll see or notice it frequently.



Identifying resources

Resources

Return to Content

In this activity, you'll identify resources that can help you achieve your goals. The most successful students will seek help to achieve their goals.

Question 1

What resources will you need to gather or seek out?

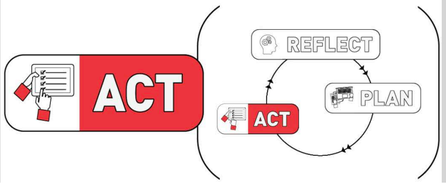
- [ ] Study groups are a great way to discuss common misunderstandings, work on problems, quiz each other, and get support as you work through tough courses.

  List the friends you might contact to study with or to set up a study group.

- [ ] Help Centres: The Help Centres are staffed by experts who can help you. The Chemistry Help Centre is open to all first and second year students.

- [ ] Your Science Buddies: This is a space where you can come and meet and chat with senior students who will answer questions and share their experiences and expertise. Students in all years come to meet with Your Science Buddies, who know that all parts of life as a university student are interconnected and who have developed strategies to succeed. Learn more

- [ ] SASS is uOttawa's Student Academic Support Service, which has many services to help students succeed: SASS



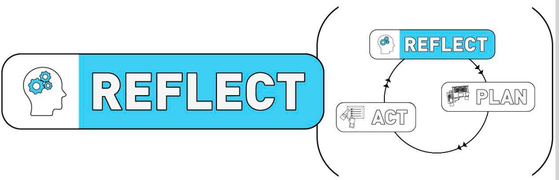
Time to Act!

Hopefully you've worked through this module, set your priorities and goals, decided on a schedule (that you've put in a visible place), and have identified study strategies and resources. Now you're ready to act!

We'll check back in with you so that you can reflect on the progress you're making, revise your plans if necessary and then act on them.

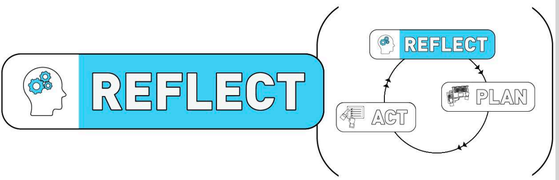
Keep working toward a consistent growth mindset and have a great semester!


Get started in SRL
Check in before/after assessments
Wrap up and next steps



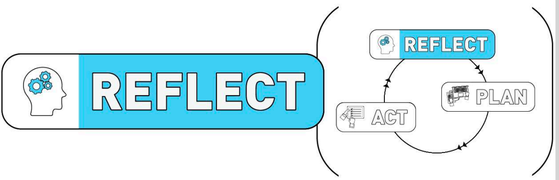
Checking back in BEFORE a major assessment (3–5 questions)
Progress toward learning outcomes

#	Statement	1	2	3	4	5	6	7	8
1	Identify the leaving group, alpha carbon, base, nucleophile, electrophile, and solvent in a given reaction	○	○	○	○	○	○	○	○
2	Decide whether a reaction is likely to proceed via an E1/S_N1, Decide whether a reaction is likely to proceed via an E1/S_N1, E2, or S_N2 mechanism or S_N2 mechanism	○	○	○	○	○	○	○	○
3	Draw a mechanism for an E1, S_N1, E2, and S_N2 reaction, given various starting materials	○	○	○	○	○	○	○	○



Checking back in BEFORE a major assessment (3–5 questions)
Basis for ratings

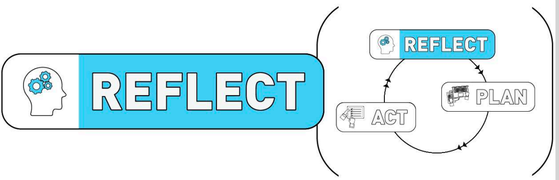
#	Statement	Never	Rarely	Occasionally	Regularly	Always
1	Intuition/feeling					
2	Read over the section/chapter/slides					
3	Summarized the section/chapter/slides					
4	Tested myself with problems I've seen before					
5	Tested myself with problems I've never seen before					
6	Worked with classmates to test each other					



Checking back in BEFORE a major assessment (3–5 questions)
Study strategies

Use the list of study strategies below to decide which ones will be most effective as you prepare for the next assessment.

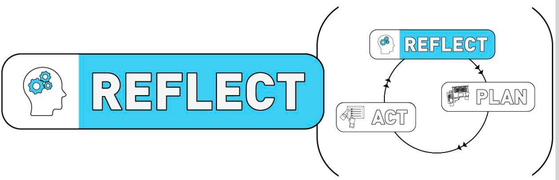
- [ ] Write down my goals where I can see them
- [ ] Make a to-do list
- [ ] Make a study schedule
- [ ] Test myself with past exams
- [ ] Read over past exams
- [ ] Do practice problems
- [ ] Make flash cards



Checking back in AFTER a major assessment (10 questions)
How did Midterm 1 go?

In the space below, spend 5 minutes writing down everything you can think of about how the course is going so far. You can include how you're feeling about the course and midterm or final exam, your effort level, how you're studying, outside factor affecting the course (positively or negatively), help you've sought (was it helpful?), friends, professor, etc.

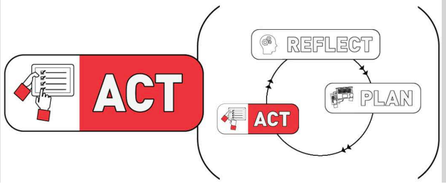
Now review your goals and study strategies from before the [assessment]. What changes will you make, if any?



Checking back in AFTER a major assessment (10 questions)
How did Midterm 1 go?

What is your current mindset towards the course? Remember your inner voice.

#	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	My ability in this subject is something I cannot change.					
2	When a problem gets really hard, I give up.					



Checking back in AFTER a major assessment (10 questions)
How did Midterm 1 go?

#	Statement	1	2	3	4	5
1	To what extent are you following the schedule you made at the beginning of the semester?					

What changes might you make to your schedule, if any?

Here's a link back to Planning Your Time in case you want to remake your schedule.

Use the list of study strategies below to decide which ones will be most effective as you prepare for the next assessment.

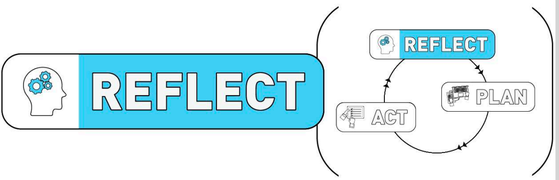
- [ ] Write down my goals where I can see them
- [ ] Make a to-do list
- [ ] Make a study schedule

What help could you seek?

- [ ] **Library:** The library has a number of searchable databases (for example, key chemistry databases), and many other resources (online and in print). You can also borrow technology, such as iPads and research study group rooms!
- [ ] **Friends**: Study groups are a great way to discuss common misunderstandings, work on problems, quiz each other, and get support as you work through tough courses.

  List the friends you might contact to study with or to set up a study group.


Get started in SRL
Check in before/after assessments
Wrap up and next steps



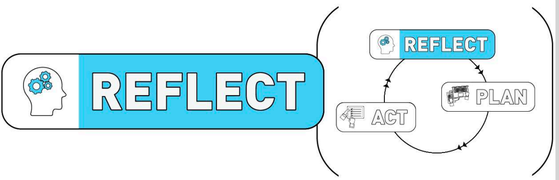
Checking in before the final exam

What progress have you made so far in progressing towards your SMART goals? Is there anything that you want to change now that you're in the final stretch?

#	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	My ability in this subject is something I cannot change.					
2	When a problem gets really hard, I give up.					

Rate your knowledge or skill at the following, with 1 being lowest ability (not able) and 10 being highest (mastery).

#	Statement	1	2	3	4	5	6	7	8	9	10
1	Give the definition of SRL and each phase (in your own words)										
2	Identify personal expectations for this module										



Course wrap-up questionnaire

To what extent do you agree with each of the following statements, which refer to this Hack Your Learning module about self-regulated learning and growth mindsets?

#	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	The module was an important component of this course					
2	The module improved my learning					
3	The module improved my awareness of my own knowledge					
4	The module improved my ability to be autonomous in my studies					

What did you learn in this course? Please list as many things as you can, which may be related to any part of the course or your experiences during the course, including the discipline's ideas, knowledge, skills, etc.

1) Take a moment to think about all the things you've done in this course and other aspects of your life (e.g., family, job, personal, other courses, etc.). What are you proud of? What would you change?

2) Take some time to look back over this Hack Your Learning module, with its components of growth/fixed mindsets, goal-setting, metacognition, scheduling, and more. What have you learned? How will you use these ideas in a future learning setting (course or regular life!)?

3) How will you use the knowledge or skills gained in the Hack Your Learning module in the future?

For your own course(s)

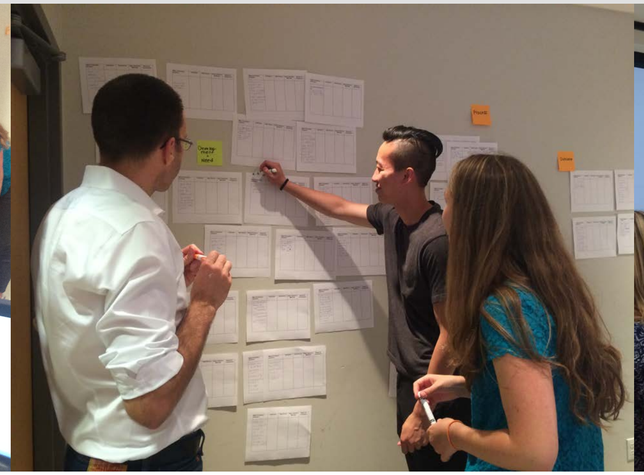
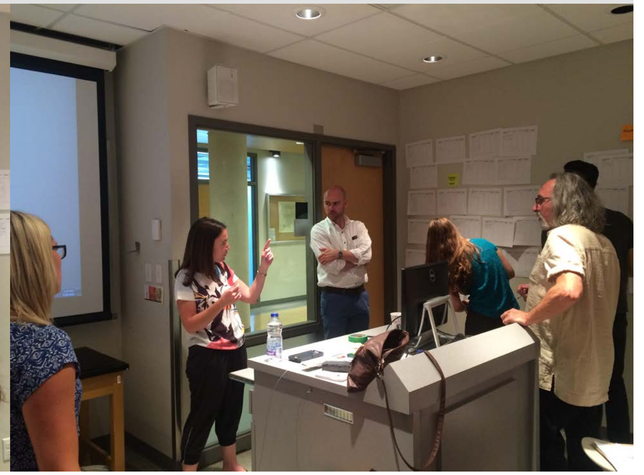
In what ways could you see integrating this module in one (or more) of your courses?

What do you see as potential challenges or barriers?

Does the module work?

The evaluation framework: Practical Participatory Evaluation

"The core premise of P-PE is that stakeholder participation will enhance evaluation relevance, ownership and utilization."
Cousins and Whitmore, 1998

Evaluating the Module: The Framework

How many students use the modules?

- Usage statistics

How do instructors perceive the modules?

- Questionnaires, focus groups

What resources are needed?

- Document review

How do students perceive the modules?

- Questionnaires, focus groups

To what extent do students achieve the modules' learning outcomes?

- Student assessment records

What elements can be transferred across disciplines?

- Faculty and student questionnaires

Module evaluation has been deemed REB exempt, based on the Tri-Council Policy on Ethical conduct for research involving humans. We provide information forms that tell participants how their data will be used, including how confidentiality will be maintained.

Preliminary findings

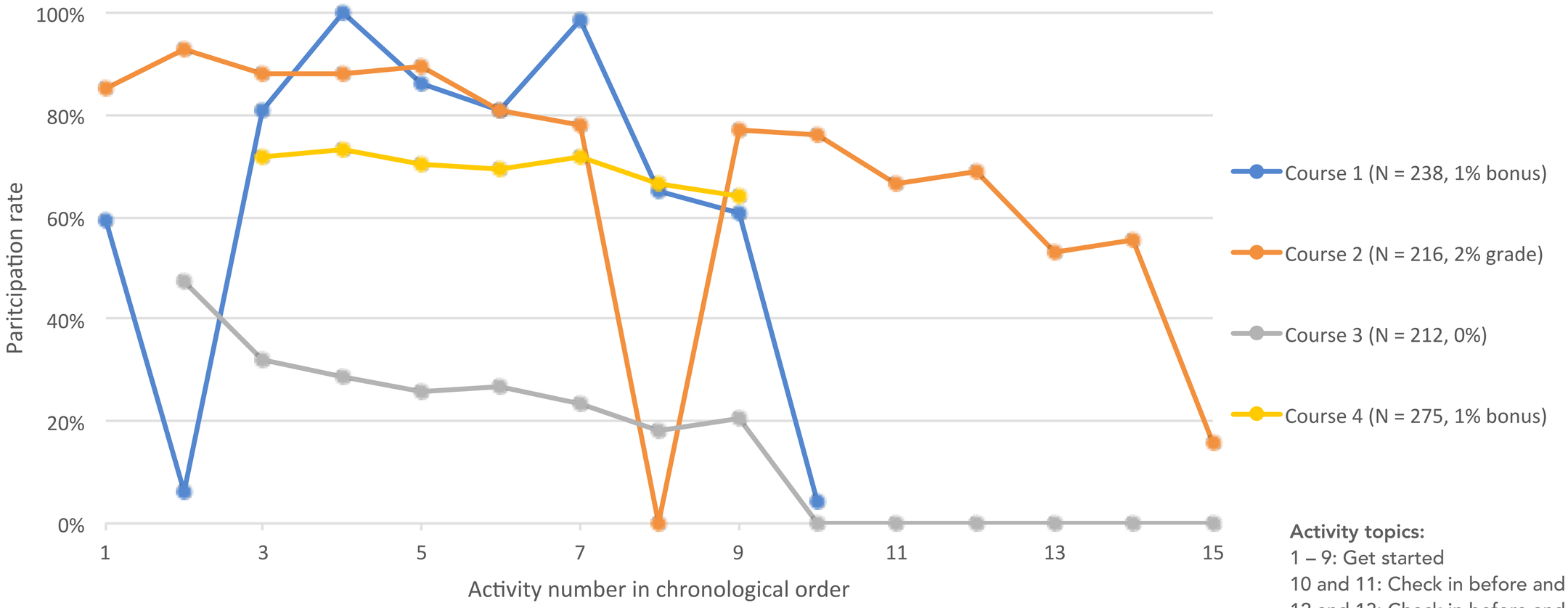
1656 Students have used the module

80% First time doing such training

82% Believe the module will improve their learning

How many students complete the modules?

Good participation rates when at least a bonus is given



Activity topics:
1 – 9: Get started
10 and 11: Check in before and after midterm 1
12 and 13: Check in before and after midterm 2
14: Check in before the final exam
15: Course wrap up questionnaire

What kinds of answers are students providing?

- Average words per response= 55 words
- Standard Deviation= 35 words

Example 1- 58 Words

I am taking this course since it is a career requirement. I used to really like chemistry but have had a hard time understanding it in university. Hopefully taking the time to do practice problems will help me improve my understanding in this course. I am expecting to pass but getting a mark over 75% is my goal.
-Alix

Example 2- 19 words

It is a requirement for my biology degree. I appreciate organic chemistry and I would like to do well.
-Sem

Example 3- 100 Words

This course is a program requirement in order to get my undergraduate degree. This course is important to me because I need to do well in order to get a good GPA so that I can get admitted into Med school later on. Success would be getting a final letter grade of at least an A. It is important to me because it will prove that I can become something more than what I am now, since I struggled with chemistry through my years of study and it will give me more confidance in achieving my dream of becoming doctor.
-Logyn

Pseudonyms are used to protect students' identities

How do students perceive the modules?
Growth and fixed mindset

Source: focus groups and end-of-course survey

I like that **a growth mindset makes you realize that it's okay to make a mistake** and fix it later on.

I tried to **apply it to other classes** as well.

I feel like **one thing *should* be repetitive: Making sure you're looking at your mindset.** It makes sure you're not on autopilot through the course. I think that's the main point of the module.

Going over the mindset stuff was helpful to **realize I had a fixed mindset and I had to change**.

Patton, M. Q. Qualitative Research & Evaluation Methods, 2014.

How do students perceive the modules?
Goals

Source: focus groups and end-of-course survey

I had known SMART goals since high school, but I never really had to break down our goals with those criteria. **I started doing that in all of my other classes too.**

It got me thinking about **how I was going to maintain and sustain and achieve that goal**

Patton, M. Q. Qualitative Research & Evaluation Methods, 2014.

How do students perceive the modules?
Rating skills/Learning Outcomes

Source: focus groups and end-of-course survey

The questions where I had to answer questions about my skill levels in all of the categories **helped identify where I needed to improve**

Without the module, I wouldn't have looked at the learning outcomes so carefully so I found the module really useful

Helped make the **course expectations more clear**

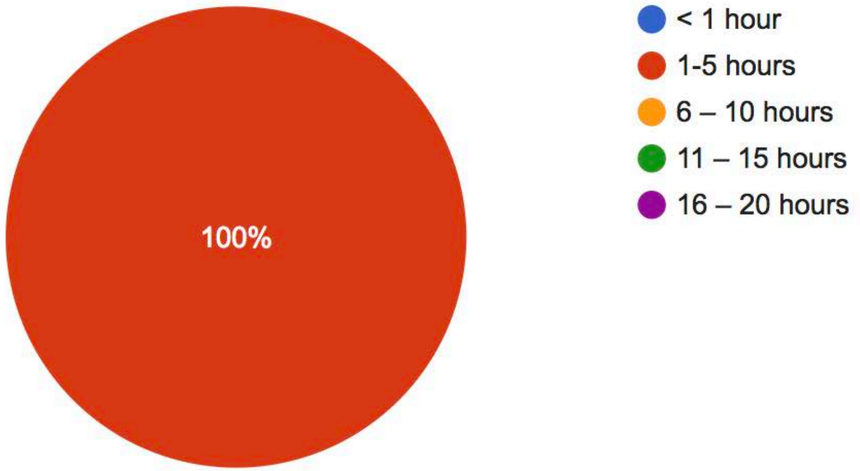
When I put a zero for a rating that really made me think and work on that thing

Patton, M. Q. Qualitative Research & Evaluation Methods, 2014.

How do instructors perceive the modules?

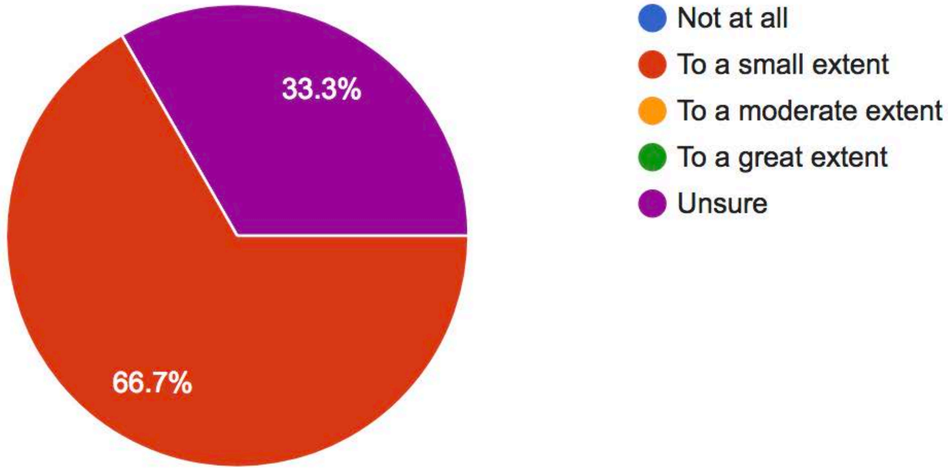
Approximately how many hours did you spend adapting the module to your course?

3 responses



To what extent do you believe you had to change the module to adapt it to your course?

3 responses



What are the effects of the modules on educators' teaching?

Created or refined the course's learning outcomes

Discussed self-regulated learning, mindsets, and metacognition in class and/or on syllabus

What elements of the modules are transferable across academic disciplines?

Production: Everything is transferable except learning outcomes which need to be tailored.

Students reported that they transferred some elements of the module to their other courses: Mindset, SMART goal setting, scheduling

Next steps

GROWTH & GOALS

Course start: learn concepts, reflect, and plan → Check in before and after assessments → Wrap up and transition to future courses and career

- ☐ Consultation on program-level module with vice-deans, directors, and chairs
- ☐ Course-level module propagation: TLSS workshop, webinars

November 21
12 – 2 pm

1 – 4 hours
Adapt existing template
No major course changes

Instructions and support provided

Results export to spreadsheet

Reuse in future years