

EMULATING TUTORIALS in response to the Travel Ban

Face to face tutorials are the obvious preference to facilitate the exploration and deepening of learning of lectured content and the opportunity to address misconceptions or gaps in learning. But hosting the same experience virtually, as we are currently forced to do to suit the demand for remote learning, may not be as worse an option as you might first suspect.

Careful design of a synchronous and an asynchronous learning environment can enable positive student outcomes. Such a design would solve some pressing face to face tutorial issues as well as improving the capacity of the learner to deepen thinking as students are able to spend longer processing the material.

Tutorial Activity	Who it affects	Benefits	Disadvantages	Overall learning efficiency /10
Face to face in groups (as opposed to 1 on 1)	Tutor	<ul style="list-style-type: none"> - Frequent checking for learning - Quickly correct misconceptions or pivot tutorial direction - Detailed explanations - Immediate response to questions - Live demonstrations and workings of equations and mathematical solutions 	<ul style="list-style-type: none"> - Some students can dominate discussions and their responses mistakenly assumed as the group's general understanding - Addressing issues of a few can lead to expert-reversal effect for those who don't need the help 	8
	Student	<ul style="list-style-type: none"> - Discussions can deepen present understandings - Discussions can extend thinking 	<ul style="list-style-type: none"> - Superficial access to content is possible as the discussions can't be seen and thus re-read - Distraction is possible with inattention resulting in missing information that is likely pre-requisite for further sequences of learning. - If student misses opportunity to ask questions there may be no further avenues to address issues - Missing a tutorial results in missed learning opportunities to deepen/confirm/extend/address issues 	
Synchronous – using Zoom.cn	Tutor	<ul style="list-style-type: none"> - Tutor can still demonstrate workings through examples - Tutor can still engage in live discussion and pivot tutoring to address misconceptions - Detailed explanations - Immediate response to questions 	<ul style="list-style-type: none"> - Tutor can't see student working through problems to correct misconceptions - Student has to upload their workings for checking - Some students can still dominate discussions and checking ALL learning is difficult - 	7
	Student	<ul style="list-style-type: none"> - Discussions can deepen present understandings - Discussions can extend thinking 	<ul style="list-style-type: none"> - Keeping up with the session if having to upload content – cognitive overload - Technical issues – bandwidth; Wi-Fi dropping out - Less chance of engaging with a physical community 	

Asynchronous	Tutor	<ul style="list-style-type: none"> - Forces careful design of sequence of learning – incremental difficulty with worked examples - If heterogeneous pairs/small groups are established and learning promotes ‘near transfer’, lots of issues can be peer corrected, saving tutor time and promoting independence - Less face to face time freeing up time for other activities 	<ul style="list-style-type: none"> - Infrequent checking for learning - If worked examples are not correctly designed, it takes time to know - Misconceptions can spiral amongst peers if not addressed quickly – can make them difficult to unpick - If attendance in discussions not compulsory – difficult to monitor and manage - Academic integrity can be compromised 	6
	Student	<ul style="list-style-type: none"> - Ability to reread sections of the discussion to seek clarification or reaffirm existing thoughts - Students have a chance to ponder on learning and deepen understanding - Greater differentiation of learning materials and progression through them - More freedom and risk taking to express thoughts without social/peer pressure constraints or indeed that of the tutor (not wanting to appear wrong in front of them) - More use of dual coding is possible to reinforce learning 	<ul style="list-style-type: none"> - Worked examples have to be uploaded - Less chance of engaging with a physical community - Assigned partners may be detrimental to motivation to participate, and therefore learning 	

HOW TO ENHANCE SYNCHRONOUS LEARNING

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<p>Set the rules - It is vital that the tutor sets the expectations for the session as soon as possible. Students need to be taught how to engage in this medium: taking turns, clearly indicating that they have finished speaking, being polite when questioning another’s response, when they should only listen and when they should write on the discussion boards, how much writing they should include in their responses, whether they will be required to upload some of their workings in solving problems.</p> <p>All potential technical issues including what to do if their signal drops out should be discussed immediately and also presented as a resource in MyUni. Setting clear expectations and anticipating the need to troubleshoot technical issues will mitigate the cognitive overload that students will likely experience initially in this mode of learning.</p>	<p>Making use of models and examples – as much as possible, set up a situation where you prepare responses that build incrementally in difficulty. Ideally, you would be able to screenshare your work as you annotate and speak out loud your methods – see graph for options (the mobile camera or visualiser would be the best option).</p> <p>Conversely, the tutor will want to see the students’ workings, and this could either be uploaded to a designated space (in MyUni) or held up to the webcam.</p> <p>Choose 2 student examples - take the class through each example – perhaps rewriting them from the upload so all can see them. Often, if any misconceptions are present, it will serve as another teaching moment for the others in the group. If workings are correct, it will serve as a motivator for the successful student.</p> <div style="text-align: center;"> <pre> graph TD A[ZOOM shared screen] --> B[CAN write on screen using stylus] A --> C[CAN'T write on screen] B --> D[take screenshots for future reference] C --> E[have a mobile camera] C --> F[don't have a mobile camera] E --> G[can write on a page in pen] F --> H[will have to continually hold up your page to the camera] </pre> </div>	<p>Making use of discussions – when the tutor indicates, students should write responses on the discussion board. This is a way to check for understanding, and would emulate any writing the students would do in a face to face session.</p> <p>CRITICALLY, the tutor should always monitor the participation of all students and be aware of dominant voices. This will involve calling out particular students if they aren’t getting involved.</p>	<p>Be patient – there will undoubtedly be some glitches during this process, but once you and the students get the hang of it and work out the best way to see each other’s work, it should be relatively smooth. If Zoom lags too much then you can revert to an asynchronous approach, outlined below.</p>

HOW TO ENHANCE ASYNCHRONOUS LEARNING

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<p>Set the rules – as with synchronous, it is vital that the tutor sets the expectations for this type of communication as soon as possible (Prichard, Bizo, and Stratford (2006). Students need to be taught how to engage in this medium: what a good response looks like in terms of length and quality, how to be polite when questioning another’s response, whether they will be required to upload some of their workings in solving problem for example.</p> <p>There are excellent resources instructing how to use discussion boards effectively here. It’s also good to see how the discussion boards are advertised to students and how they are supposed to use them: here</p>	<p>Providing adequate resources – carefully designing the sequence of material presented to stimulate the discussions is crucial. Your discussions should act like a lecture, with clear boundaries made between chunks/stages of information, with each stage building in difficulty/complexity: initial questions should be more closed in nature until students are comfortable with the material and have developed the requisite schema to pursue more open-ended questions.</p> <p>An advantage of asynchronous communication is that the students have ample time to go over the resources and study the examples, so well sequenced design should mitigate many possible errors or misconceptions – or at least provide clear identification of students who still can’t understand the topics. Wiley and Voss (1999) showed that structured controversy produces better outcomes – presenting a correct and an incorrect solution could be an effective strategy when equations are needed, challenging students to explain why they choose either solution and presenting their reasoning.</p>	<p>Assigning teams – it may be beneficial to create small teams within the larger discussion that work together before they post into the whole class board. Creating pairs or threes of heterogeneous students will maximise the involvement of each participant and may be more ideal than larger groups. The stronger in the group benefits from tutoring the other, and the others benefit from being tutored probably quicker than they can be by waiting for the ‘real’ tutor. When the team eventually posts, they may be a step/stage ahead than if they posted individually.</p> <p>THERE IS A LARGE CAVEAT HERE THOUGH: Utilising peers is effective, but only when the design of activities promotes near transfer of knowledge. Near transfer is characterised by thinking that is ‘close’ to the original taught concept and can rely on the developed schema established in previous teaching to process the new content and problem. This condition is lessened the more the students’ schema is developed, as explained by the Expertise Reversal Effect.</p>

LEARNING is the ACQUISITION of SCHEMA

TOP TIP

It matters little what age or sector your students are in. Where they are on the cognition continuum determines the type of learning experiences you design, the questions you can ask and the quality of responses you can hope for. This is because the brain looks very different at each of these stages, stages that ultimately represent the amount of knowledge and understanding about a given topic.

The brain stores information by creating [schemata](#), or webs of interrelated ideas. The more knowledge a student has, the greater the number of connections that the schemata possesses and the more likelihood that more complex questions will be able to be processed, and answered.

