# Flipped Learning Symposium Poster Abstracts

**What flipping can look like (Part 1)?**

**Day 1: Monday 14th November 4.30pm-6pm, SAHMRI**

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This work-in-progress project is focused on helping university teachers to design and implement effective flipped classes. It is evident that the flipped classroom has become a core model of e-learning in contemporary teaching and learning. This pedagogy incorporates a group of learning strategies including blended and active learning. It is well documented if students are able to preview key concepts, face-to-face classes can be more effectively used for active learning. A 2012 University of Adelaide-funded flipped classroom project validated many of the professed advantages of this pedagogy. Teachers participating in the project indicated a clear willingness to use flipped learning. However, widely-shared obstacle identified by the teachers from this study, was a lack of confidence to apply concepts of flipped learning into practice. This may be the 'weak link' that's compromises flipped learning implementation. Therefore, as universities promote flipped learning as a contemporary teaching approach – there is an underlying challenge - that teachers are being asked to implement a pedagogy that many may not fully understand. Our work-in-progress project runs from February 2015 to December 2016. By implementing teacher development workshops, construction of an interactive website and developing flipped classroom resources, we aim to build staff capacity to use this e-learning approach to enhance their students learning experience. Twenty professional development workshops for some 350 university teachers across Australasia are scheduled during the project. Data from workshops run so far indicates 98% of participants felt more confident to design flipped classes, whilst 100% would recommend the workshop to their colleagues. Developing the 'Seven Key Steps to Flipping' has been a major outcome of the workshops and these steps are subject to peer review in subsequent workshops. This rigorous approach ensures a scholarly strategy to creating effective flipped classroom through its ‘road testing’ in a wide range of disciplines and institutions.
Student predisposition toward pre-learning

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Key words: Flipped learning, Team-Based Learning, pre-learning, learning aspects

It is important to find ways to develop self-direction in students who are required to learn course content before a class session. It is also important to help them to understand aspects of learning, so that they may benefit from the pre-learning process (Dunlap & Grabinger 2003; Black et al. 2006) inherent in Flipped Learning and Team-Based Learning (TBL). This research was carried out in several deliveries of the same foundation entrepreneurship course taught using TBL.

Students in different deliveries of the same entrepreneurship class were asked, in the very first session of each class, to reflect on what they personally considered to be the most important aspect of learning (Smith 2008); (1) learning information (including facts, principles, concepts), or (2) learning how to apply or use that information in new situations, or (3) learning how to learn (or to develop lifelong learning skills). They were also asked to identify which they could do effectively outside the classroom on their own, and which could be achieved in class, working with their classmates and the lecturer. Results were compiled, and presented to students in the following session.

In each class, a majority of students considered that the most important aspect of learning for them was either learning how to use information, or to develop lifelong learning skills. In most classes, a majority considered that they could most effectively learn information by themselves outside the classroom, and that the classroom was best used for learning how to apply or use information in new situations. This pattern was found to be significant and has important implications for students and educators. Evaluations show that students gain useful insights from this exercise, and build their disposition toward lifelong learning (Dunlap and Grabinger 2003), as well as to improve engagement (Jarvis et al. 2014).
Encouraging student engagement in pre-work

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Key words: Pre-work, student engagement, content delivery, videos, formative assessment

One question that is often asked about the flipped classroom is: “How do you encourage students to do the pre-class work?” Let’s face it, if students fail to come to class prepared, it is difficult to move forward with the planned activities. Where does that leave you? What effect will this have on prepared students? How will you cover the required content?

In 2016, we flipped two first year bioscience units for allied health students. In flipping our classroom, we eliminated the didactic delivery of content via lectures enabling us to increase our small-group face-to-face time. Content which was previously didactically delivered in lectures, was provided to students as pre-work in the form of text and short videos and made available to students via our online learning management system (Moodle). This allowed us to extend, apply and consolidate student understanding of the online material in class.

To encourage completion of pre-work, we set a compulsory 80% hurdle requirement on pre-work completion and tested student knowledge at the start of each of our workshops. Students completed a short summative quiz (worth 1% each week) in engineered groups that encouraged collaborative learning and increased their sense of responsibility to engage fully in pre-class materials. Over the course of one semester, 96.5% of students completed their pre-work prior to their first class each week and this led to a perceived increase in student understanding and their engagement in class materials and activities.

Based on evidence gathered from our surveys, student written reflections and focus group discussions, we present some of the data and successful strategies that were employed in our flipped classroom to encourage students to engage with and complete pre-work.
Implementing team-based Learning (TBL) in accounting courses

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Key words: Team-based learning, diversity, RATs, CATME

Most universities include collaboration as a graduate attribute, many specifically refer to teamwork as a desirable outcome. Whilst there is general acceptance that students should engage in group work activities they are not popular. Replacing this paradigm with one of team-based learning (TBL) overcomes many of the negative aspects of group work and provides considerable benefits. TBL is grounded in the theoretical framework of social constructivism where learners were integrated into a knowledge community placing more emphasis on the social context of learning (Vygotsky, 1978). There is much pressure today on academics in all disciplines to adapt their teaching styles to better suit new millennial learners. Accounting faces additional challenges with considerable evidence, both anecdotal and from a large body of research, suggesting a significant proportion of students have negative perceptions of accounting subjects (Warren & Young, 2012), in part due to the highly technical nature of the subject matter. Using a pre-test post-test survey instrument, this study examines the perceptions and expectations of students in a number of accounting courses. Students are organised into permanent strategic groups to create a cooperative learning environment for the whole semester and work on multiple group activities to improve learning via development of self-managed learning teams. One such activity is a Readiness Assessment Test where students are required to do some pre-class preparation (flipped approach) and then take a short in-class online quiz to test key concepts. Referred to as RATs, they are first taken and submitted on an individual basis via mobile technology (e.g. Socrative or Kahoot) which automatically marks the submitted answers. The same RAT is then taken again as teams, which must come to a consensus on the answers, so lack of preparation will hinder the team effort. Timely feedback on individual team members’ performance and team dynamics is essential and teams undertake a peer-review process to assess the contributions of each team members via an online peer evaluation tool twice during the semester.

In particular, their perceptions of team-based learning (TBL) as a key pedagogical component of their learning activities were investigated. Key elements of implementing the flipped approach, for successful implementation of TBL such as readiness assessment tests (RATs) and use of web based technologies for feedback, assessment and evaluation such as CATME to enhance TBL outcomes are discussed.
MCQs are OUT: Engaging undergraduates with varied in-class activities

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Key words: Team-based Learning, flipped classroom, application exercises, engagement

During their in-class time in a flipped classroom, students gain practice in applying the specialist knowledge of a field to solve real-world problems. Providing students with a safe environment to ‘have a go’ essentially scaffolds them through the higher levels of Bloom’s taxonomy, application, analysis, and synthesis. Design of the in-class activities is critical, to engage the students and promote higher level discussions.

We have used an example of a flipped classroom, Team-Based Learning (TBL) for >5 years. The rule of effective in-class application activities during TBL relies on the 4Ss: 1) Significant problem (needs to be authentic and meaningful); 2) Same problem (all students work on the same problem); 3) Simultaneous reporting (teams either report at the same time, or their results are posted and discussed at the same time), and; 4) Specific choice (responses have a defined structure and are not open ended). Provided these rules are met, in-class activities are unlikely to totally fail. However, there is a difference between activities that go OK, and activities that reverberate with energy and ideas. In our experience, the repeated use of MCQ flash cards and other simple reporting systems results in a rapid decline in energy. By varying the style of application exercise and the way in which the groups or teams of students report back to the class, the students remain fully engaged for longer periods of time. Careful design of these exercises also ensures that the team’s success is dependent on the contributions of all of the students in the group.

We will provide details of applications that have proven successful in terms of improved learning outcomes, information retention and synthesis of multiple complex items in the curriculum. These include an application activity requiring movement and artistic creativity, preparation of a flow chart, use of post-it notes and A3 sheets of paper to get students to post decisions and reasons to back them up around the lecture room, use of Plickers (https://www.plickers.com/) as an alternative reporting tool, and use of the new Echo360 recording system in Canvas. These ideas will resonate with teachers in all discipline areas and are modifiable for any teaching method.
Flipping the Practical: Encouraging self-regulated learning and improving student engagement in second year science courses

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Key words: Flipped classroom, practical classes, online, Articulate Storyline, blended

Objective: Enhancing student preparedness, understanding and engagement in science practical classes.

Significance: Practical classes are compulsory and we noticed an obvious problem; students were not required to do any preparation prior to class and were therefore disengaged and confused in class. The student attitude seemed to be: “we just have to attend the practicals because they are compulsory.” Many students did not read their laboratory manual prior to class to ensure they understood the principles they were about to learn. This made it difficult for students to make the link between theory and application. Therefore, we designed interactive, online pre-class activities to “Flip the Laboratory” to encourage student preparedness for practical classes.

The Flipped Design: Interactive activities were developed using Articulate Storyline which were released to students 1 week before practical classes. The activities included videos and short multiple choice quizzes (check points) to allow students to test their knowledge, with unlimited attempts and immediate feedback. The pre-practical activities carried a small weighting to encourage motivation and participation. The activities also included safety information and calculations which students were required to apply in class, where teaching staff could answer specific questions. The practical activity in-class allowed data to be collected for assessment by a summative practical report.

Outcomes: Sustained improvement in average and distribution of practical grades has been observed in our courses over the last 5 years. Failure rates have also declined despite a 25% increase in student enrolments. Students also indicated the pre-practical activities encouraged independent learning, and reassuringly, 70% of students enjoyed the activities.

Conclusion: Flipping the Laboratory resulted in more effective use of class time. Students asked more thoughtful questions which indicated higher level thinking and metacognition. Overall, students had a better understanding of what was required in the practical and begun tasks with limited instruction.
Adopting a Flipped Classroom approach to foster learning and engagement in science and technology education at the undergraduate level

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Key words: flipped learning, science education, inquiry-based learning

One of the challenges of improving science education in undergraduate primary teacher education students is to move away from the traditional in-class lecture and tutorial based teaching. This poster outlines how the author developed a component of an elective undergraduate unit titled, ‘Scientific Discovery and Inventions’ offered by the School of Education at Western Sydney University. The author adopted a model that used a flipped classroom approach in the delivery of content through on-line lectures and a mixture of on-line and face-to-face inquiry-orientated tutorials. For the first half of the unit, the author focused on the nature of scientific discovery while a colleague developed the second half of the unit with a focus on inventions. The poster will elaborate on the content and delivery of the first half of the unit, equivalent to 4-5 weeks of study. The content focused on topics such as the origins of the Universe, earth history, plate tectonics, and conditions for life, biodiversity and evolution as a context for motivating undergraduate students in scientific discovery. The first face-to-face tutorial explored how life may be detected on Mars and other planetary objects in our solar system and drew on the scientific discovery of extremophiles and what conditions can life exist and what makes a planet Earth-like and thus could harbour life. A variety of YouTube clips were used together with a series of slides/images and text points to highlight key points plus a series of inquiry activities to help students engage, explore, explain, elaborate and evaluate key ideas or concepts. The author will discuss how he orchestrated the learning and discuss some of the challenges that impacted on curriculum development and the assessment of student learning.
Flipping the Endocrine System: 
Enhancing Student Learning Outcomes in Blood Glucose Control

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Key words: glucose homeostasis, endocrine control, online games, case based scenarios

Students studying first year anatomy and physiology are required to understand the homeostatic control of the human body which is well illustrated by blood glucose control. Traditionally, students have measured blood glucose homeostasis in fasted subjects in response to a drink of Glucaid© during endocrine practical classes. This has been problematic in that students have not always been willing volunteers to fast and have their blood sampled, and, ethics approval has been required for the practical session to proceed. As a result, a shift in pedagogy was implemented for students to participate in active learning in laboratories by reviewing case-based scenarios related to glucose homeostasis, identifying normal and abnormal responses. This involves a knowledge of the glucose tolerance test which was presented online using a short recorded lecture, a relevant website, a conceptual quiz and an online memory game to enable students to self-test their knowledge of blood glucose control concepts prior to practical sessions. In 2015, 53% of students accessed the online module prior to attending the face-to-face practical session. Implementation of this flipped design resulted in tutors observing active engagement in practical classes with respect to the case based scenarios and a 4.8% improvement in summative assessment performance, related to the face to face class, was observed in the 2015 student cohort. Students indicated that the online module, particularly the self-tests, assisted their understanding of the topic. Flipping this aspect of the endocrine system effectively enabled students to apply foundation knowledge of blood glucose control. Importantly, student learning outcomes related to blood glucose homeostasis were improved by adopting this flipped pedagogy.
Treading water or developing understanding?

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Key words: Flipped classroom, Human bioscience, student-centered, collaborative learning

Over the past three decades we have been teaching human bioscience to allied health cohorts using a traditional didactic approach that is content heavy. Despite having consistently excellent SETUs and positive feedback from students, it was difficult to engage students in their learning. With an ever changing student cohort, technological advances and altered student expectations, we embarked upon the design of two new units, using the flipped pedagogical approach. Therefore, in 2016, we flipped our classroom.

In flipping our classroom, we eliminated the didactic delivery of content via lectures enabling us to increase our small-group face-to-face time. Content, in the form of text and videos, was made available to students via our learning management system (Moodle), allowing us to better utilise the face-to-face time for higher level thinking in small group classes. Students were engineered into semester-long groups to promote collaborative learning. Our face-to-face classes consisted of 4 hours of collaborative student-centred learning focussed towards extending, applying and consolidating understanding of the online material.

To evaluate the effectiveness of our approach, we surveyed the students prior to the academic year and at the end of each semester. Additionally, students were asked to complete regular reflective journals and participate in focus group discussions. The data generated from this analysis indicates that although students were resistant to the flipped approach initially, they quickly realised the improved learning opportunities and, by the end of two semesters, became strong advocates for this style of learning.
The discipline of Speech Pathology is undertaking a redevelopment of the Anatomy and Physiology curriculum of their Bachelor and Masters courses. We have tailored a topic that combines backwards by design pedagogy, flipped classroom resources and speech pathology specific learning experiences to offer students a relevant and engaging learning experience.

We have created a series of learning modules that students progress through during the topic. Each module can be taught as stand-alone and can therefore transfer to other topics within their program, both within the same year and across year levels. The objectives of this redevelopment project are to ensure that the topic's learning outcomes are consistent with accreditation standards to provide scaffolding for cohorts who have a wide diversity of knowledge in this area and to develop authentic assessments to encourage deep and creative learning. These objectives are being achieved by clearly and consistently communicating learning objectives, providing multi-modal and relevant learning resources for online and in-class use and creating a variety of assessment methods that encourage deep learning.

We present our preliminary experiences of flipping the Anatomy and Physiology classroom for our first year undergraduate cohort.
Flipped learning is theorized to drive student driven learning and engagement. This study reports on student’s perceptions of a ‘Flipped Learning’ experience, which was part of a large cross institutional study, with first year students, studying bioscience units. Students were located on 3 campuses (Melbourne, Sydney, Brisbane) at the Australian Catholic University. Students were invited to complete a ‘learning experiences’ survey and a follow up post–flipped experience survey online. Forty nine students completed the first survey consisting of questions about learning style and goals for learning. Following the survey students experienced a two week ‘Flipped Learning’ module on the Pharynx and swallowing control. Students participated in online self-paced learning activities containing self-testing elements before attending a ‘flipped lecture’. Face to face classes following the lecture revolved around students teaching each other content and utilising the feedback from the diagnostic questions in the online activity. Only 33 students undertook the follow-up survey. In the first survey, many students reported that they were prepared to increase their workload to learn more effectively however there were mixed responses about whether students preferred face to face classes or online delivery. In the second survey, almost all students (97%) reported their interest in the topic was stimulated by the flipped activity, and 94% stated that the experience helped them to see the important of learning the topic for their future career. Students found the learning activities helped them identify effective ways for learning a new topic (85%) and many students (88%) also reported that they actively participated in the follow up face to face class and felt more prepared to do so. There were mixed responses in the written comments. The theory behind flipping, the ‘Flipping Kit’ used in this study as well as the full results of the surveys will be presented.
Flipping human anatomy lectures:
Engaging students using digital media and mini lectures

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Key words: flipped classroom, anatomy, forearm muscles, engagement, Quizizz

Research shows that the average attention span of students is currently between 15 and 20 minutes and steadily declines after the first 10 minutes. The pressures of work and family responsibilities combined with the relatively recent introduction of online learning technologies, means students are choosing to listen to recorded lectures rather than attending face-to-face lectures. Students that do choose to attend lectures become easily distracted by activities on their mobile devices. Thus, a significant number of students only attend compulsory classes and hope to gain understanding from these short activities. This approach has proven difficult for students learning the content-heavy discipline of human anatomy. At Western Sydney University, it has been observed that one area in particular that suffers from a lack of engagement is the anatomy of the forearm, with the details consistently proving difficult for students to remember. Students often resort to memorizing large amounts of content and perform poorly in later assessment tasks. The aim of this project was to 'flip' what is traditionally a didactic lecture on the forearm in a first year unit for the Clinical Health Sciences and a 2nd year unit in Medical Science. Pre-and post-class activities were developed with checkpoints for students to encourage (and test) retention of the information. In-class activities were developed to link to the pre- and post-class activities. Pre-class activities involved students watching three videos and completing a quiz based on the information relayed in the videos. The first in-class activity was developed using a free application called “Quizizz.” A case study was used as a post-class formative assessment to test understanding of content and whether they can apply their knowledge in clinical contexts (particularly important for the clinical health science students). The flipped classroom approach will be formally evaluated through student surveys and focus groups to determine how students feel about this learning approach as a method learning and retaining difficult content.
Applying Flipped Learning to Placement Preparation and Employability Skills: Can it be done?

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Key words: Flipped Learning, placement preparedness, employability, reflective practice, graduate attributes

Purposeful reflective practice is crucial to students’ learning and in allied health practice, differentiates between the ordinary and the extraordinary. Despite the importance of reflective practice, the literature and experts concur that this skill is not taught well and by final year students have disengaged from it. Employers want graduates competent at reflective practice and other employability skills such as effective communication, interpersonal skills, teamwork and competency managing a demanding workload. This study addressed the question whether 18 hours of classroom teaching could be delivered as Flipped Learning over a two day intensive to prepare final year dietetic students for 40 weeks of placement and teach employability skills.

The aim was to prepare students through an increased understanding and application of (1) underpinning skills such as reflective practice, giving and receiving feedback and managing critical conversations (2) competency-based learning and (3) an awareness of self and emerging professional identity.

Pre-class features included presenting the basic concepts students needed to remember and understand as bite-sized videos, online narrated powerpoints with embedded checkpoints and short online quizzes. In addition, students completed a validated questionnaire prior to Day 1 and prior to Day 2.

In the classroom, students worked in small teams and using reflective practice applied what they had learned about themselves and from the pre-class work to problem-based scenarios from practitioners, hypothetical client situations and to themselves. On completion of the two days, students submitted a reflection which was peer-reviewed. Process was evaluated with an online daily quiz. While on community placement, learnings were further consolidated in fortnightly reflective practice tutorials.

Placement readiness and teaching employability skills can be effectively done through Flipped Learning. Direct instruction moved from groups to the individual and then in subsequent interactive and practical tutorials, the educators guided students to apply concepts and engage meaningfully in skills for placement and employability.
A flipped approach to fostering collaboration for paramedics learning to manage mental health presentations

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Translating concept into practice: flipped learning approaches in health sciences

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Key words: flipped Learning, collaboration, paramedicine, communication, mental health

This project aimed to engage students of paramedicine in a collaborative learning process in order for them to develop understandings of a range of mental health presentations using a flipped learning approach. A further aim of this project was to use the learning design adopted as a vehicle to develop students’ interpersonal skills.

Paramedics need to manage a range of mental health related emergency presentations. In order to do so they need to have sufficient understanding of the nature of a range on mental health issues and draw upon well-developed communications, interpersonal and negotiation skills. The teaching strategies used in this project assisted to develop both the knowledge and skills required to effectively operate as a practitioner in this challenging field.

Previous strategies used to teach mental health management have been more teacher driven and not designed to meet the specific knowledge and skills requirements of paramedicine students.

Students complete an online learning package related to a specific mental health presentation in 5 weeks of the semester. In corresponding weeks, student groups are assigned to present an overview of this presentation to the remainder of the class. Pre-exposure to basic aspects of the specific mental health condition means students are able to engage in discussion with presenting students.

In the online survey completed by students there was evidence that the flipped learning approach fostered engagement with both theoretical information and other students.

Students generally reported favorable outcomes in relation to both knowledge of mental illness and development of interpersonal skills.
Have we achieved what we planned?
Staff and student outcomes following implementation of flipped capacity building workshops.

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Key words: evaluation, staff and students, flipped design, RATED CLASS A

Evaluation is integral to learning design so we can understand the impact of our designs. When planning our capacity building project for staff, we developed an evaluation plan to monitor the progress and outcomes of the project. This planning involved refining our project’s purpose, outcomes, approaches for data collection, and required resources. Our key stakeholders were identified as the Office for Learning and Teaching, Project Team, staff from workshops and their students. Outcomes related to staff engagement in the workshops and capacity to design flipped classes post-workshop, as well as exploring their students’ experiences of their flipped classes. Data collection was organised using a framework (Scott, 2009) that addressed workshop design, support for staff/students, delivery and impact. The criteria used for making judgements about these various aspects were the RATED CLASS A checkpoints (Scott, 2009). Overall, staff have been satisfied with the workshops regarding supporting their skills development for flipping (>98% agreed to a moderate or great extent), as well as workshop format (>94% agreed to a moderate or great extent), and available feedback and support (97% agreed to a moderate or great extent); the majority of staff (>90%) indicated they would recommend the workshop to colleagues. Staff who participated in workshops designed flipped classes in their courses. Preliminary survey data from their students have highlighted areas for review (e.g. scope of induction information; student completion of pre-class activities; and feedback and assessment links). The students' experience has been positive overall (>80% agreed to a moderate or great extent that they actively participated in class; and >75% agreed to a moderate or great extent that they linked theory to practice). Collectively these data demonstrate the workshops have assisted staff in designing and implementing flipped classes that students have responded to positively.


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