

GOOD Flipped Classroom CASE



HTI 33012 & 34012

Class size

80

Students

Undergraduate Students
(Year 2 & Year 3)

19

Instructors

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Department

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Details of Flipped Classroom IMPLEMENTATION

Why did the instructor use the flipped classroom approach?

Martin and Daphne adopted the flipped classroom approach, incorporating virtual microscopy and online learning materials to address challenges in traditional histology teaching. The conventional teaching method faced two primary issues. Firstly, students struggled to gain a deep understanding of complex histological knowledge and receive sufficient personalised guidance from teachers due to restricted class time. Secondly, students had limited access to microscopes and few opportunities for collaborative learning due

to the limited availability and inconsistent quality of clinical specimens. By implementing the flipped classroom approach, Martin and Daphne effectively addressed these problems, enriched students' learning experiences, improved the quality of classroom teaching, and established a strong foundation for students' future careers.

How was the flipped teaching approach implemented?

Preparation of materials

→ Martin and Daphne carefully implemented the flipped teaching approach by preparing comprehensive materials, primarily comprising a digital slide collection and first-person perspective videos. The digital slide collection included digital histology slides, annotations, and narrated videos. To create this collection, they initially selected digital histology slides based on tissue quality, staining clarity, and key features, using virtual microscopy technology that converts traditional histology glass slides into digital formats. To make the slides more informative and engaging, annotations were added, and voice narratives were recorded.

First-person demonstration videos illustrating histological techniques were developed specifically for the practical sessions. A GoPro action camera was used to record the practical steps, including embedding, microtomy, and special staining. The footage was then edited using DaVinci Resolve 18 video editing software and uploaded to the Blackboard and Panopto learning platforms. Additionally, short video clips of digital content were created and shared on social media platforms such as Instagram and YouTube to enhance accessibility and engagement.

Pre-class activity

→ Students were required to study the materials from the slides and videos mentioned above and then complete quizzes on Blackboard. Martin and Daphne monitor students' learning progress through the platform's backend data, analysing participation rates, video engagement, quiz performance, and more. This analysis allowed them to identify common issues and adjust class plans to address any knowledge gaps.

In-class activity

→ Class time was dedicated to collective video viewing, typically involving one or two short clips (2–3 minutes each) that presented a third-person perspective of specimen staining procedures. These videos provided a visual context that complemented the lecture content, enabling students to better grasp the practical techniques being discussed. Martin would pause at key moments to elaborate on specific still images, highlighting important details and clarifying complex steps.

After the video, students had focused discussions as Martin answered quiz questions and clarified key concepts. Before the practical sessions, students reviewed specimen structures via digital slides, which allowed them to begin hands-on tasks promptly. During the practical component, students worked in groups, using traditional microscopes to observe specimens and engage in peer discussions that reinforced their learning. This structured preparation made in-class activities more efficient, technically focused, and intellectually engaging.

Post-class activity

→ Students reviewed learning materials available on Blackboard and revisited short video clips shared on social media to consolidate their knowledge and facilitate further learning. Sharing short videos on social media platforms such as Instagram and YouTube provides online learning materials for students, allowing them to review the content learnt in class conveniently.

What was the impact on student learning?

The adoption of the flipped classroom approach, combined with virtual microscopy and online learning materials, had a notably positive impact on student learning. According to the student feedback survey, 68.5% of students agreed or strongly agreed that they would recommend this approach for histology studies. Key strengths highlighted by students included: pre-class digital slides that aided preparation for practical specimen analysis; virtual specimens embedded in lecture notes that facilitated self-paced learning; and pre-practical quizzes that reinforced core concepts. Longitudinal tracking of eSFQ further demonstrated consistent, statistically significant improvements in learning experiences from the academic year 2020/2021 to 2023/2024.

Besides improved learning experience, the flipped approach also helps prepare students for future careers by enhancing hands-on microscopy skills and fostering early competence in digital pathology. The healthcare system is currently transitioning from traditional to digital histology. Students who have acquired in-depth technical skills in the class and developed the ability to transition between traditional and digital histology methods can position themselves well for the evolving demands of the field.

What are the good practices that can be learnt from this case?

Developing Digital Resources to Enhance Students' Self-Learning

- Traditional teaching methods often face limitations due to the scarcity of high-quality and rare specimens, which are insufficient to meet the diverse learning needs of students. By creating a narrated digital slide collection, this approach ensured consistency and accessibility. Each student could engage with high-quality specimens for self-directed learning, regardless of their location or schedule. This method effectively overcame the spatial and temporal constraints of laboratories, allowing students to access specimens at any time and from any location.

Utilising Social Media to Increase the Accessibility of Learning Materials

- To enhance accessibility, short clips of digital content were uploaded to public social media platforms, such as YouTube and Instagram, rather than being restricted to internal systems like Blackboard. This allowed students to view the content on personal devices conveniently. By leveraging the open accessibility of social media platforms, this approach broadened the availability of learning materials and helped students consolidate their knowledge.

What were the challenges encountered during the implementation and what solutions were used?

Low Pre-Class Participation Among Some Unmotivated Students

- During the implementation of the flipped classroom approach, one challenge was ensuring that all students consistently engaged with the assigned pre-class materials, such as instructional videos and digital slides. While the majority of students completed these tasks as required, a small group of about 10 per cent did not complete the tasks. As a result, these students missed out on participation points and entered class less prepared. To address this challenge, clear expectations regarding pre-class preparation were communicated to all students. The importance of completing these tasks was regularly reinforced through reminders. Additionally, the completion of pre-class assignments was formally integrated into the grading system. This made it clear that active engagement with preparatory materials was an essential component of the course. These measures helped to improve participation among the small group of students and encouraged more consistent involvement from all students.

Challenges in Time Management

- In implementing the flipped classroom approach, Martin faced time management challenges, which manifested in both the pre-class preparation phase and the in-class teaching sessions. During the pre-class preparation phase, the flipped classroom required a significant time investment to create high-quality digital content, such as videos and slides. To address this problem, Martin effectively reduced his individual workload and improved preparation efficiency by streamlining the content creation process and encouraging resource sharing among instructors. In the classroom, the highly interactive teaching method occasionally caused discussions to extend beyond their scheduled time. Despite this, students responded enthusiastically to these extended discussions, valuing the opportunity for deeper engagement and clarification. Therefore, instead of rigidly adhering to time constraints, Martin chose to adjust the lesson pacing to allow for greater flexibility. This strategy shifted the focus to fostering meaningful interaction, which ultimately enhanced student engagement and satisfaction.