Chapter # 26

ENHANCING MOTIVATION IN DENTISTRY EDUCATION THROUGH AN INTERDISCIPLINARY MULTIMEDIA PROJECT-BASED LEARNING APPROACH

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ABSTRACT
In recent years, fostering active student engagement and interdisciplinary learning in health sciences education has become increasingly important. This chapter presents an in-depth evaluation of the BioFilm project, an innovative Project-Based Learning initiative implemented with first-year Dentistry students at Universidad San Pablo-CEU, including both international and national students. Many dentistry students do not perceive the relevance of basic science subjects in their future profession, which can make learning process overwhelming. The BioFilm project was designed to bridge this gap by integrating Biology, Genetics, Biochemistry, and Physiology through collaborative didactic video creation. This approach promotes knowledge integration, encourages transferable skills development, and leverages Information and Communication Technologies (ICT) to enhance motivation. Drawing on the pilot project experience, this chapter offers a comprehensive analysis of its design, outcomes, and reflections from both students and faculty, highlighting key challenges and outlining recommendations for future implementation.

Keywords: project-based learning, interdisciplinary integration, student engagement, Information and Communication Technologies (ICT).

1. INTRODUCTION

Traditionally, first year curricula in health- related degrees, including dentistry have been structured in discrete subjects, often isolated from one another, limiting opportunities for integrated understanding and contextualization (Nehm, 2019). Furthermore, many dentistry students at the San Pablo CEU University struggle to see the immediate relevance of foundational subjects - such as Biology, Genetics and Biochemistry, and Physiology- to their future professional practice. This results in diminished motivation and fragmented learning experiences. Regretfully, this situation is common across Science, Technology, Engineering, and Mathematics (STEM) education, where educators must face the ongoing challenge of balancing knowledge acquisition with practical application (Freeman et al., 2014).

University dropouts and delays in academic progress often reveal significant issues related to learning motivation, which are influenced by the perception of interpersonal relationships and the functioning of the educational environment (Pedditzi & Spigno, 2012).

Student motivation is, therefore, a key factor in academic success, particularly in disciplines that require the integration of basic and applied knowledge. According to Self-Determination Theory (SDT) by Ryan and Deci (2000), motivation can be classified as intrinsic, when students engage out of interest and personal satisfaction, or extrinsic, when their actions are driven by external rewards. In the context of health sciences education, fostering intrinsic motivation is essential for achieving deep and lasting learning. However, many dentistry students perceive basic science subjects as disconnected from clinical practice, which can reduce their motivation and hinder knowledge integration.

Active learning methodologies such as Project-Based Learning (PBL) have gained attention due to their effectiveness in promoting deep learning, student autonomy, communication skills, and critical thinking (Pranjol et al., 2024). In this line of evidence, PBL fosters interdisciplinary understanding by encouraging students to apply knowledge across traditional subject boundaries within a real-world context. In this context, PBL engages students in a problem-solving scenario, promoting self-directed learning, the application of knowledge in practical settings, students' autonomy, capacity for communication and teamwork, and higher order thinking skills (Freeman et al., 2014). It also creates a dynamic learning environment where students actively participate, learn from diverse perspectives and knowledge areas, and build transferable skills (Pranjol et al., 2024).

The BioFilm project was specifically designed to promote interdisciplinary integration and active learning through the collaborative creation of didactic videos, with the aim of enhancing both intrinsic and extrinsic motivation among students (Ryan & Deci, 2000). This initiative seeks to demonstrate the relevance of basic sciences in clinical training, foster autonomy, creativity, and teamwork, and develop digital skills essential for the future professional practice of dentistry students.

2. BACKGROUND

The School of Medicine at CEU San Pablo University is characterized by its strong international orientation, offering Dentistry degree program in both Spanish and English. This results in a high proportion of international students from diverse geographical and cultural backgrounds, which enriches the educational environment. However, this diversity also presents challenges in fostering integration and in encouraging active participation from all students within the university setting. In fact, these factors, combined with the clinical orientation of the student cohort and the wide range of prior educational experiences, pose significant challenges when teaching basic sciences to first-year Dentistry students. Accordingly, not all students begin the course with the same foundational knowledge, which can hinder their ability to fully engage with both the subject matter and the educational project. Addressing these disparities requires the implementation of inclusive teaching strategies and personalized academic support.

This scenario was identified by the lecturers of Biology (1st semester), Genetics and Biochemistry, and Physiology (2nd semester). These three basic subjects are often perceived as heavily memorization-based, disconnected from the clinical aspects of dentistry and with new and complex concepts which may contribute to fragmented learning that decrease student interest and that intimidate and disengage students. Integrative approaches that promote interdisciplinary learning have therefore been promoted as key strategies to bridge this gap (Burgess et al., 2020).

Science, Technology, Engineering, and Mathematics (STEM) educators are often challenged and encouraged to refine their curricula to offer a balance between acquiring knowledge and its application to real-world contexts (Freeman et al., 2014). In dental education, several studies have highlighted the challenges related to student motivation and engagement in basic science subjects, such as Biology, Biochemistry, Physiology, and Genetics (McInerney & Fink, 2003, Taglieri et al., 2017). The BioFilm project, based on Project-Based Learning (PBL) strategies, was designed and tested in a pilot course during the academic year 2023/2024 in response to these educational needs, particularly focusing on increasing student engagement by integrating several foundational subjects across two semesters in the first year of the Dentistry program. Through collaborative creation of didactic videos, students synthesize and communicate complex scientific concepts, promoting not only knowledge acquisition but also transversal skills such as teamwork, project management, and digital literacy. Videos can also provide a student-centred resource that promotes peer learning and reflection. Furthermore, multimedia tools and video production into PBL contexts stimulates students' creativity and enhances the learning process by requiring students to organize and communicate complex information clearly and succinctly (Rasi-Heikkinen & Poikela, 2016). In fact, recent developments in higher education, accelerated by the COVID-19 pandemic, have underscored the imperative for effective integration of Information and Communication Technologies (ICT). The digital competence of students is increasingly recognized as a critical component of their employability and lifelong learning by the European Commission's Digital Education Action Plan (European Commission, 2020). Accordingly, the BioFilm project incorporates ICT tools strategically, tapping into students' familiarity with multimedia content to enhance motivation and learning outcomes. As this strategy not only promotes knowledge acquisition but also enhances communication, it would create a robust framework for effective and inclusive education given the multicultural origins of the CEU San Pablo University students. Thus, to ensure the integration of the acquired knowledge in the three previously mentioned subjects, first-year dentistry students were organized into work groups and selected a topic previously proposed by the lecturers. Throughout the academic year, they were encouraged to submit two videos, one per semester, in which they condense and integrate the knowledge from the different subjects in an engaging and informative manner. This pilot project has enabled the implementation of the suggestions for improvement informed by student feedback through final project surveys, as well as by the needs identified by the teaching staff throughout the project's development.

This context provides both the theoretical grounding and practical rationale for the design and implementation of the BioFilm project, highlighting its potential to strengthen interdisciplinary integration, enhance student motivation, and develop digital competencies within dental education. This chapter presents an expanded analysis of the BioFilm project, detailing its design, implementation, and outcomes, and reflects on lessons learned and future directions and aims to contribute to the broader discourse on innovative pedagogical approaches in health sciences education and to provide insights applicable to similar interdisciplinary educational initiatives (Panadero & Jönsson, 2013; Jönsson & Panadero, 2017; Tinoco et al., 2023).

3. OBJECTIVES

- To develop an innovative strategy aimed at increasing student interest and motivation in basic science subjects (Biology, Genetics and Biochemistry, and Physiology) by demonstrating their relevance to clinical practice and future professional development.
- To promote interdisciplinary learning by integrating concepts acquired over two academic semesters, enabling students to achieve a holistic understanding of biological systems relevant to dentistry.
- To incorporate information and communication technologies (ICT) in the presentation of project-based learning (PBL) outcomes, specifically through the creation and dissemination of didactic videos, fostering skills in digital content creation which are increasingly vital in health education.
- To foster the development of key transversal competencies, including teamwork, critical thinking, and the ability to communicate complex concepts—skills essential for students' future professional practice.
- To assess the short-term and potential long-term educational impact of these innovations by analyzing student and faculty feedback, satisfaction rates, and specific learning outcomes, and by comparing results across academic years.
- To explore the applicability and transferability of the BioFilm model to other health science curricula and multicultural settings, contributing to the wider discourse on interdisciplinary and digitally mediated learning.

4. METHODS

4.1. Participants

In the 2023/24 academic year, a total of 150 students participated in the BioFilm project. The majority were female (72.47%) and aged between 18 and 20 years. Students were organized into self-selected working groups of 5 to 6 members, promoting peer interaction and collaboration from the outset.

The project was supervised by nine faculty members from two departments: Basic Medical Sciences (School of Medicine) and Chemistry and Biochemistry (School of Pharmacy). Each group was guided through the subjects of Biology (1st semester), Genetics and Biochemistry, and Physiology (2nd semester).

The BioFilm project was approved by the Ethics Committee of Universidad San Pablo-CEU under reference number 776/23/96.

4.2. Group Distribution and Topic Assignment

Students freely formed their groups during the first week of classes and chose a topic from a set of ten interdisciplinary topics carefully selected by the instructors. These topics were designed to integrate key concepts shared among Biology, Genetics and Biochemistry, and Physiology syllabi, including renal physiology, cholesterol synthesis or glucose metabolism among others. Assigning relevant topics early facilitated effective work planning and coordination. Each group was assigned a dedicated tutor, who provided ongoing support and monitored progress through scheduled sessions, helping maintain focus and ensuring conceptual integration (Figure 1). The assigned tutor was responsible for monitoring and supervising the project to ensure its proper development and to guide students whenever the topic or content deviated from the intended objectives.

4.3. Project Design and Implementation

The BioFilm project spanned two semesters and included two major deliverables designed to scaffold learning progressively (Figure 1):

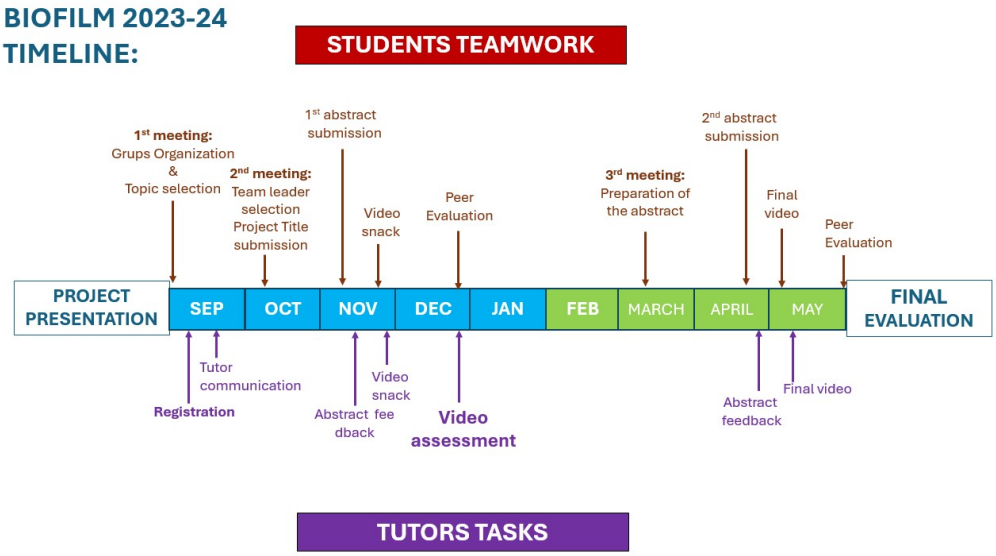
- **First Semester:** students worked on creating a short one-minute video or "snack", focused on the biological perspective of the assigned topic.
- **Second Semester:** Students developed a final integrative video lasting up to three minutes, synthesizing interdisciplinary content from Genetics, Biochemistry, and Physiology alongside content from the previous semester's Biology.

In both semesters, students submitted a preliminary script for their videos, evaluated their peer students and participated in tutoring sessions that provided guidance and support to enhance their work. This phased approach allowed students to build foundational understanding before developing more complex integrative outputs, promoting deeper learning and confidence.

4.4. Use of Technological Tools

The TEAMS platform was utilized as a virtual space to coordinate the project, enabling the submission of videos, script summaries, and tutoring sessions. Through this platform, professors continuously monitored and supervised students' progress. For video production, students had the autonomy to select video production tools best suited to their preferences and technical skills, encouraging creativity and diverse multimedia outputs.

Figure 1.
Project Biofilm timeline and key milestones of student and faculty tasks.



4.5. Evaluation and Assessment

The project assessment was multifaceted in order to capture various learning dimensions: First, the preliminary scripts for the videos were evaluated, contributing 5% to the final grade, encouraging preparation and organization. Second, a peer evaluation was conducted, which contributed 15% to the final grade with students assessing other groups'

videos using standardized rubrics aligned with learning outcomes. Lastly, tutors and faculty applied a rubric to evaluate the final videos (Table 1), considering aspects such as originality, integration of the subjects' content, ability to synthesize information, teamwork, communication skills, and production quality (80%). Additionally, each student evaluated their own group members and performed a self-assessment, using rubric to foster reflection, personal accountability, and professional development. This project grade weighed 5% of the final grade in the three subjects.

The continuous monitoring of students during educational projects and the use of rubrics as an assessment tool are widely recognized practices in educational sciences due to their positive impact on achieving learning objectives (Panadero & Jönsson, 2013; Jönsson & Panadero, 2017; Cockett & Jackson, 2018, Hawe et al., 2021; Tinoco et al., 2023).

Table 1.
Rubrics for video evaluation.

Skill	Excellent (4)	Very Good (3)	Good (2)	Fair (1)
Creativity	Highly creative and original, ideas, innovative thinking.	Selectively and appropriately applies to others' ideas.	Incorporates others' ideas without critical evaluation.	Insufficient evidence to assess
Oral & writing communication	No grammatical, diction, or spelling errors.	Some grammatical, diction, or spelling errors.	Several grammatical, diction, or spelling errors.	Many errors.
Work planning, teamwork communication	Fully meets all requirements and even surpasses expectations	Successfully fulfills all specified requirements.	One criterion has not been fulfilled.	Several key requirements were not satisfactorily fulfilled
Concept integration Critical thinking	The content is relevant and appropriately incorporates information from the initial video, fulfills expectations	Updated content on the topic that appropriately integrates information from the first video	Good content, but poorly integrated.	Insufficiently developed content that does not fulfill the purpose of the assignment
Digital	The video and sound quality are excellent.	The video and sound quality are good.	Quality is not great, but sufficient.	Video does not have sufficient quality.

5. RESULTS

Final project surveys were designed to evaluate students' perceptions of the new learning approach and their level of satisfaction with the PBL methodology.

5.1. Quantitative Results

Of the 150 participants involved in the Biofilm teaching innovation project during the 2023 pilot course, a total of 65 students (43.33% of participants) completed the final survey. The demographic profile was female (74%) and between 18 and 20 years of age, and a 29.21% of the students were international students reflecting the multicultural nature of the Dentistry program.

Overall, the results showed students rated their satisfaction with the BioFilm project at an average of 7.6 out of 10, and 83.1% of respondents indicated they would recommend the project to their peers (Figure 2).

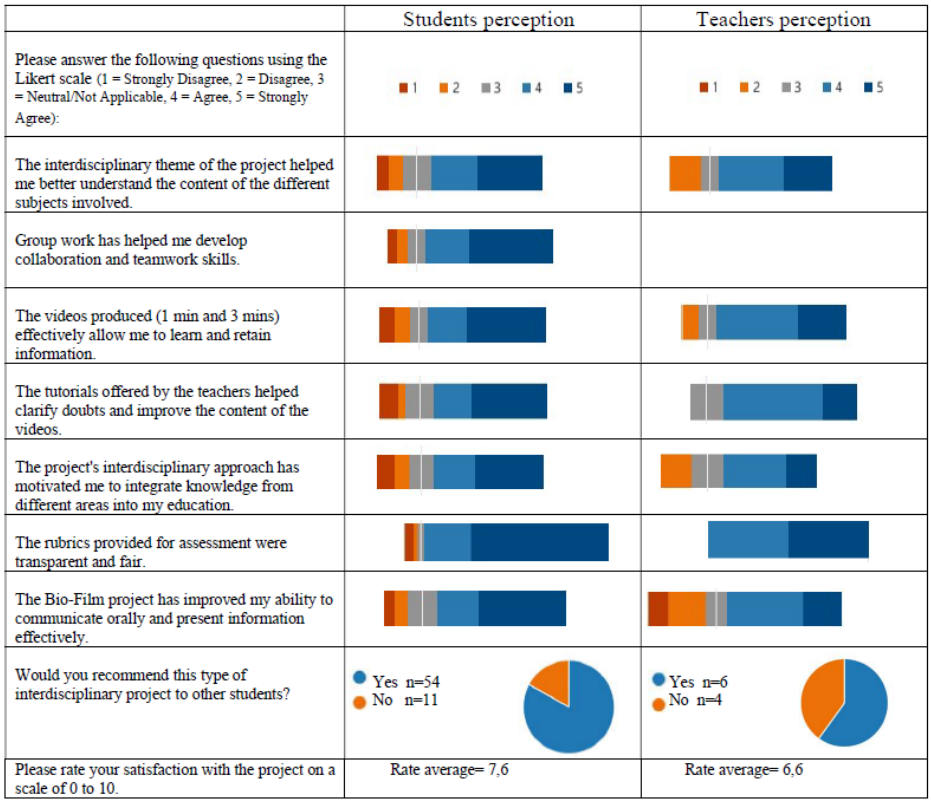
Most of the students surveyed agreed or strongly agreed that the interdisciplinary approach of the Biofilm project was effective in integrating the contents of the different subjects, that teamwork helped them to develop collaborative skills, and that videos helped them better understand the topic; the tutorials were useful in clarifying their doubts while completing the work. Moreover, the students also positively highlighted that the rubrics

provided for the evaluation were fair and clear and that the project improved their ability to communicate orally and present information from different subjects.

The BioFilm project aimed to balance intrinsic and extrinsic motivation. Autonomy in topic selection and creative video production nurtured intrinsic motivation, while rubrics provided structure and clarity, satisfying competence needs. However, as self-determination theory warns, excessive emphasis on grades can undermine intrinsic motivation (Ryan & Deci, 2020).

According to the survey, the perception of the educators regarding the usefulness of the project was only 6.6 out of 10, one point lower than the students' rating. However, educators were pleasantly surprised by the high quality of the video presentations submitted by students. These multimedia projects not only showcased technical proficiency but also demonstrated a deep integration of the knowledge acquired across the disciplines. The use of digital tools empowered students to creatively synthesize complex concepts, resulting in final products that exceeded expectations in both content and presentation. This experience highlights the potential of technology-enhanced PBL to foster meaningful learning and interdisciplinary collaboration. Moreover, the teachers unanimously agreed that the interdisciplinary focus and evaluation rubric were clear and effective. However, they noted challenges with tutorial follow-up, workload, and communication tools.

Figure 2.
Students´ and teachers' perception in their learning and teaching experience during BioFilm project.



5.2. Qualitative Feedback

Nevertheless, the implementation of PBL and multimedia projects faced several previously reported challenges, including initial student resistance, increased faculty workload, logistical complexities, and the necessity for adequate technological infrastructure and training (Shpeizer, 2019; Burgess et al., 2020). Students expressed positive sentiments including appreciation of the innovative learning method through video creation and the overall "perfect experience." The constructive criticism focused on inconsistent tutorial sessions despite repeated contact attempts, lack of accountability for non-participating group members, perceptions of excessive workload with limited consequence for those not contributing.

Effective integration requires robust institutional support, structured pedagogical frameworks, clearly defined assessment rubrics, and continuous formative feedback mechanisms (Freeman et al., 2014). Given the multicultural and multilingual composition of the student body at Universidad San Pablo-CEU, the project also needed to address issues of linguistic and cultural diversity. Research suggests that when appropriately scaffolded, interdisciplinary PBL in multicultural contexts fosters stronger cohort identity and mutual understanding (Pranjol et al., 2024).

The educators suggested improvements centered around enhancing tutorial quality and regularity, better scheduling to meet academic goals, reconsidering the communication platform by adopting Blackboard instead of Teams, and the need for additional time allocated within the curriculum for such projects. Some faculty perceived that many first-year students struggled to grasp the project's objectives, often treating it as a task to complete quickly rather than a learning opportunity. The use of assessment rubrics enabled educators to monitor the development of students' competencies throughout the entire program, providing feedback and promoting continuous improvement in achieving learning outcomes. This systematic tracking, supported by well-designed rubrics, helps students understand the evaluation criteria and align their work with educational objectives (Panadero & Jönsson, 2013; Jönsson & Panadero, 2017; Tinoco et al., 2023).

5.3. Discussion

Starting a health sciences degree as dentistry often presents challenges for first-year students. Many of them enter with high expectations directly linked with clinical or applied subjects. However, their initial curriculum is composed by foundational courses as Biology, Genetics and Biochemistry and Physiology. This conflict between expectations and academic reality can lead to frustration, reduced motivation, and, in some cases, course withdrawal. Understanding and addressing these motivational gaps is essential to support student persistence and success.

In this context, the BioFilm project was purposefully designed to motivate dentistry students by fostering engagement and interdisciplinary learning while maintaining a balance between intrinsic and extrinsic motivational forces, as conceptualized by Self-Determination Theory (SDT). According to SDT, intrinsic motivation refers to engaging in activities for their inherent interest and enjoyment, whereas extrinsic motivation involves performing tasks to obtain external rewards or avoid sanctions (Ryan & Deci, 2000, 2020). Within this project, autonomy was embedded through student choice of topics and the creative process of producing educational videos, which nurtured intrinsic motivation by promoting ownership, creativity, and personal relevance. These elements align with SDT's emphasis on supporting the basic psychological need for autonomy—a critical driver of deep learning and sustained engagement.

Overall, the BioFilm project was successfully implemented with first-year Dentistry students at Universidad San Pablo-CEU, was positively received and represents an innovative and multidisciplinary pedagogical initiative, grounded in Project-Based Learning (PBL) and the use of Information and Communication Technologies (ICTs). As PBL is not systematically integrated ~~as~~ into a teaching method in higher education, usually focused on a lectured format, it often relies on teachers its implementation and integration (Freeman et al., 2014, Shpeizer, 2019). Dentistry students commonly struggle to connect the theoretical content of Biology, Genetics, Biochemistry, and Physiology to their future clinical practice, resulting in low motivation and fragmented learning (Freeman et al., 2014; Nehm, 2019). BioFilm addresses these issues by fostering horizontal and transversal integration across disciplines through the creative production of didactic videos, promoting ownership of learning and collaboration. This chapter expands on the preliminary findings presented at the END 2025 conference (Arriazu Navarro et al., 2025), providing a more robust bibliographical framework and a comprehensive evaluation of the results.

The integration active methodologies such as Project-Based Learning and video creation appear to enhance both intrinsic and extrinsic motivation. Autonomy, creativity, and teamwork foster intrinsic motivation, while rubrics and grading serve as extrinsic incentives. Striking a balance between these types of motivation, as Ryan and Deci (2000) suggest, is essential for meaningful learning. The BioFilm project aimed to promote autonomy and self-assessment, while rubrics provides structure and clarity. However, some students reported challenges with workload and group coordination, highlighting the need for ongoing support and adaptation.

In this pilot test, first-year students were encouraged to freely form groups and choose their PBL topic (Burgess et al., 2020), where randomized group formation ensured a diverse background of students with different knowledge levels. Lecturers were responsible for designing and planning the different deliverables, assigning the tutors based on their area of knowledge for each topic, developing the rubrics, and selecting the format for the project presentation. Beyond the academic purpose, these kinds of projects supervised by a tutor can also influence the classroom dynamics. They promote a more collaborative atmosphere where students perceive lecturers as mentors rather than adversaries (Pedditzi & Spigno, 2012). This change in perception could lead to increased engagement during the theoretical classes and the regular attendance, strengthening the overall learning experience and promoting a sense of belonging within the academic community. Thus, this activity created an ideal environment for first-year students to meet integration into university life. Video creation in educational settings has demonstrated significant benefits in enhancing student learning and integrating various subjects. Thus, students not only consolidate their knowledge through the process of scripting, filming, and editing but also develop critical thinking and technical skills. This hands-on approach fosters a deeper understanding of the material, encourages creativity, and provides a platform for collaboration among peers. Moreover, the skills acquired such as digital literacy, storytelling, and project management, are invaluable assets that can aid students in their future academic and professional endeavors (Rasi-Heikkinen & Poikela, 2016).

At the same time, the use of rubrics and the integration of project outcomes into course grading introduced extrinsic incentives. When implemented thoughtfully, such structures can satisfy the need for competence and promote internalization of extrinsic motivation toward more autonomous forms (identified and integrated regulation). Clear criteria and constructive feedback help students perceive evaluations as informational rather than controlling, thereby reinforcing their sense of efficacy and supporting self-regulated learning. In recognition of the students' effort in creating the Snack and final video throughout the semesters, their

results were included in their final grade in each subject. This grade was based on both the professors' assessments and the students' evaluations through a peer review process, as well as the grades assigned among group members. While incorporating students' evaluations of their peers' PBLs into the overall grade can sometimes lack objectivity (such as potential conflicts arising from group work, lack of criteria for evaluation, and low engagement in reviewing videos), it can also encourage them to develop professional behavior and actively participate in the project. Moreover, peer evaluations provided valuable feedback on team cohesion and the perception of actual productivity (Burgess et al., 2020).

Consistent evidence supports that tracking students throughout a project, especially through the use of rubrics, is essential for achieving learning objectives (Panadero & Jönsson, 2013, Jönsson & Panadero, 2017; Cifrian et al., 2020; Hawe et al., 2021, Tinoco et al., 2023). Rubrics not only clarify success criteria but also promote self-regulation, self-assessment, and formative feedback-key elements in competency-based education. However, some studies warn that using rubric must be carefully designed to avoid rigidity and encourage creativity (Cockett & Jackson, 2018). However, SDT cautions that when assessments are experienced as controlling—focused narrowly on compliance or comparative performance—they can undermine intrinsic motivation and lead to controlled forms of regulation, often associated with anxiety and superficial engagement. To mitigate this risk, rubrics should be framed as tools for formative feedback, emphasizing progress and mastery rather than rigid compliance. Future iterations of the BioFilm project should strengthen autonomy-supportive practices by incorporating reflective self-assessment, peer feedback, and explicit rationales for evaluation criteria. These strategies transform grading from a source of external pressure into an opportunity for growth, maintaining the delicate balance between autonomy and structure that SDT identifies as essential for optimal motivation.

In general, the BioFilm project was positively received overall, particularly for its innovative integration of multimedia and interdisciplinary teamwork which students valued highly. The student agreement on the role of group work in developing collaboration skills highlights one of the core strengths of PBL strategies in health education (Taglieri et al., 2017). Moreover, the emphasis on the use of ICT aligns with the European Commission's Digital Education Action Plan, stressing digital competence as key to future employability and lifelong learning (European Commission, 2020). The integration of video production not only supports conceptual understanding but also enhances communication and digital literacy, critical skills for modern healthcare professionals.

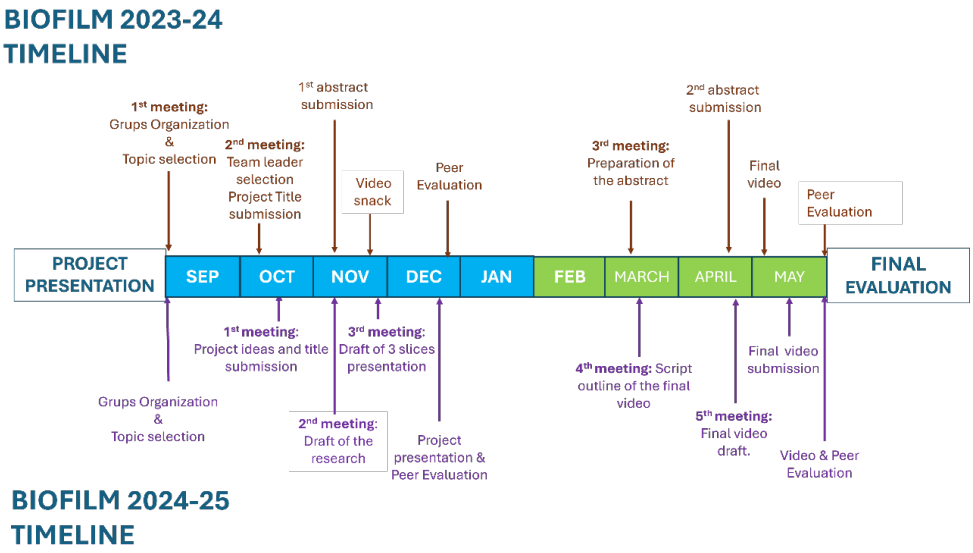
The learning strategies adopted by the students not only involve their participation in a PBL making a commitment to their peers in the working group but also imply a change in dynamics with an increased workload that generates discontent and dropout among some of the students. In general, students tend to prefer passive learning over the active despite the benefits of the latter (Taglieri et al., 2017).

Nonetheless, the results of the satisfaction survey conducted at the end of the course reflected a high acceptance of the BioFilm project among the students, with 83.07% recommending it. There was a high proportion of "agree" and "strongly agree" responses to questions related to the improvement of integration, communication, and teamwork skills (Figure 2). This result aligns with those obtained by McInerley and Fink (2003), where after implementing Team-Based Learning (TBL), 81% of the surveyed students rated the project positively, stating that it not only benefited their learning but also the development of critical thinking, integration of concepts, and improved problem-solving efficiency. However, there were some limitations in the project that included modest survey response rates and potential positive bias in feedback. Challenges remain in standardizing peer evaluation and ensuring equitable team participation. Students' qualitative feedback also invites reflection on the

timing and structure of the project. Analyzing institutional policies and support systems is required for broader adoption of this type of project-based, interdisciplinary models, addressing workload balance and curricular integration challenges (Pranjol et al., 2024).

Faculty qualitative feedback also revealed increased workload, coordination difficulties, and inconsistent tutorial engagement. These reflect well-known barriers in implementing active methodologies and underscore the need for institutional support, structured mentoring, and manageable workload distributions (Shpeizer, 2019; Burgess et al., 2020).

Figure 3.
Improvements in BioFilm project timeline and key milestones.



6. FUTURE RESEARCH DIRECTIONS

Faculty members and student feedback highlighted important challenges that have guided subsequent improvements. The satisfaction surveys conducted during the 2023/24 academic year were carefully considered, and the suggestions made by students, along with the improvements identified by instructors, were implemented in the 2024/25 academic year.

To streamline communication, submissions, tutorials, and announcements with students, it was decided to adopt Blackboard as the single platform instead of Teams during the 2024/2025 academic year. Since this is the system students regularly use for their courses, this change will minimize issues related to unfamiliarity with the tool, saving time and reducing frustration.

To ensure more personalized and detailed student follow-up, mandatory academic tutoring sessions were increased throughout both semesters (Figure 3). Furthermore, to enhance the structure and accountability of student-tutor interactions, students of 2024-2025 are now required to produce a written summary (meeting minutes) after each tutorial session. These summaries serve as a reflective tool and a record of progress, ensuring continuity and clarity throughout the development of the project.

Additionally, the video-snack activity used in the first semester was replaced by a three-minute oral presentation introducing the topic to be discussed in the final video. Also, given the 1st year experience, a special emphasis was placed on the creation of outreach videos using new technologies, moving away from traditional PowerPoint presentations.

The iterative adaptations introduced—mandatory tutorials, platform migration to Blackboard, refined deliverable formats—respond directly to these findings and are expected to enhance student engagement, clarify expectations, and optimize workload distribution to improve outcomes in future course editions.

Longitudinal studies and broader implementation assessments will be necessary to measure sustained impacts on academic success and professional skill development.

7. CONCLUSIONS

The BioFilm project demonstrates that combining Project-Based Learning (PBL) with creative video production is an effective strategy to enhance motivation and engagement in health sciences education. By promoting autonomy through topic selection and collaborative work, the initiative fostered intrinsic motivation, while rubrics and grading served as extrinsic incentives, reinforcing competence when applied as informational tools.

Furthermore, the project improved conceptual understanding, interdisciplinary integration, and the development of key skills such as digital literacy, teamwork, and project management. Survey results confirmed high levels of student satisfaction and perceived relevance. However, challenges related to workload and coordination underscore the need for ongoing support.

Future iterations should strengthen autonomy-supportive practices—such as formative feedback, self-assessment, and peer evaluation—while ensuring that assessments remain growth-oriented rather than controlling. Ultimately, the BioFilm project illustrates how technology-enhanced PBL can drive motivation, skill development, and academic success.

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