



Developing and Implementing a Video Lecture Series for the Scientific Research Methods Course Using the Flipped Classroom Model

ABSTRACT

This study examines how effective the Flipped Classroom (FC) model is in a Research Methods course for second-year students at a university in Vietnam. The flipped model focuses on self-learning through video lectures before class, freeing up class time for group activities. A mixed-methods approach was used to gather data from surveys and focus group discussions to evaluate students' views on the FC model and the quality of the videos. Results show that students liked the flexibility, independence, and group learning that the flipped model provided, which helped improve their research skills and critical thinking. Nonetheless, students pointed out issues with workload, managing time, and needing feedback from instructors. They also recommended enhancements, like better support and interactive features in the videos, such as quizzes. The study concludes that the FC model can boost student engagement and independence, but successful application needs a balance between self-learning and guidance from instructors. Adding interactive assessments, regular feedback, and time-management strategies can make the flipped approach more effective for challenging topics like research methods.

Keywords: *Flipped Classroom, Research Methods, Self-Directed Learning, Video Lectures, Student Engagement.*

Nguyen Bich Dieu

*Department of Foreign
Language Studies, University
of Danang,
Danang, Vietnam.*

I. Introduction

The demand for innovation in teaching and learning methods has made the flipped classroom (FC) model increasingly relevant. This model emphasizes self-study outside of class to save in-class time for active learning. According to Hamdan et al. (2013), FC shifts learning from group spaces to individual ones, using technology to facilitate the process. Developing video lectures plays a crucial role in supporting this model. The Research Methods course has some challenges because it is complex and has little class time, being only two credits. Even with these issues, students must gain research skills that are important for their academic progress, especially for entering research contests at their university, where student research is growing.

Using technology through the FC model helps students get comfortable with digital tools and allows them to study whenever and wherever they want. This method not only stops boredom but also lets students learn at their own speed. Adding video lectures and activities is key in meeting students' academic needs and improving their research skills.

This study aims to explore the effectiveness of the flipped classroom (FC) model in a Research Methods course through video lectures. It focuses on investigating students' perceptions of the FC model, developing and evaluating a series of high-quality video lectures, and gathering student feedback to enhance the model. The research aims to address the following key questions:

How do students perceive the effectiveness of the FC model for the Research Methods course?

How do students evaluate the video lecture series for the Research Methods course?

What strategies can improve the FC model for the Research Methods course?

II. Theoretical Framework

Social constructivism highlights how social interactions and cultural settings affect learning. It connects with the FC model, where students study materials at home and use class time for group work. This change from traditional teaching supports self-directed learning and boosts participation, leading to better learning results (Nouri, 2016; Zhu, 2023). Active engagement in class is important in FC, deepening the connection between students and teachers. Studies indicate that students in FC settings report higher involvement and satisfaction levels (Tan et al., 2015). The FC model also permits varied learning, as students can go over materials at their own speed, addressing different learning needs (Flores et al., 2016). However, some students may find FC challenging due to the lack of experience with self-regulated learning. It is vital to offer adequate support to help all students thrive in this setting (Cho & Kim, 2019).

Another relevant framework is Vygotsky's Zone of Proximal Development, which describes the difference between what learners can do alone and what they can do with help. The FC model backs this idea by letting students work with materials before class, getting them ready for collaborative activities later on. This method encourages students and enhances higher-order thinking (Barrons, 2015). The FC model promotes self-directed learning by allowing students to access content at their own pace before class, preparing them to engage actively in group tasks (Kausar et al., 2021). It also supports varied instruction, catering to students with different levels of prior knowledge.

Mayer's Multimedia Learning Theory shows that using both visual and audio ways to share information can help people understand better. Good educational videos that follow this idea lower cognitive stress and boost memory (Mayer, 2010). Videos that are broken into smaller sections with clear directions improve understanding (Ibrahim et al., 2011). Also, the emotional aspect of multimedia content is important for motivating students. Studies suggest that videos that engage emotions lead to better learning experiences, thus raising motivation and involvement (Plass et al., 2014). Moreover, multimedia tools cater to different learning styles, aiding those who learn better visually and orally (Lin, 2012). The use of multimedia across various areas like language learning and healthcare shows its effectiveness in education. For instance, multimedia has benefited language learning and motivation for English for Specific Purposes (ESP) students (Zainuddin & Sahrir, 2016). This study will look at how the Flipped Classroom (FC) model, backed by video lectures, can improve learning results in the Research Methods course. Based on social constructivism, ZPD, and multimedia learning theory, the FC model supports student independence, group learning, and tailored teaching. While there are challenges, good planning and adaptive teaching can enhance the rewards of this method. By changing from just listening to being actively involved, the FC model changes the way education is traditionally viewed, helping students connect with the material more and build important research skills. As education changes, using multimedia tools and interactive techniques will be vital to meet the varied needs of learners.

III. Literature Review

Definition of the Flipped Classroom Model

The flipped classroom model is different from old teaching methods. It puts lectures and direct instruction outside of the classroom, usually using videos or online content. In-class time is then used for hands-on activities. This method is based on constructivist theory and focuses on students being active in their learning. It has been shown to help engagement and understanding in areas like language, science, and math (Alsmari, 2020; Kenwright et al., 2016). It encourages students to learn on their own before class, which allows for deeper discussions and problem-solving during lessons (Najmi, 2020; Wong et al., 2014; Swart et al., 2015).

Flipped learning uses technology and changes teaching styles, making students accountable for their own education. Research shows that students in flipped classrooms tend to be more motivated and involved than those in traditional settings (Wong et al., 2014; Swart et al., 2015). This method helps them remember more through active participation and critical thinking (Jensen et al., 2015; Sakti et al., 2023).

Yet, there are still issues, such as students being unprepared and needing quick feedback, which can affect how well the model works (Lo & Hew, 2017). Teachers need to create good quality materials and make sure assessments match active learning objectives to get the most out of flipped learning (Porcaro et al., 2016; Sardi, 2018).

Benefits of the Flipped Classroom Model

The flipped classroom fosters interactive learning environments by delivering lectures outside class and reserving classroom time for discussions and collaborative tasks. It enhances learner engagement, improves academic performance, and nurtures self-directed learning (Hew & Lo, 2018; Kiang & Yunus, 2021). Research by Rachmawati et al. (2023) shows that students in flipped classrooms display higher motivation and engagement, while Nouri (2016) highlights the approach's benefits for weaker students by enabling them to study at their own pace.

Flipped classrooms also improve academic outcomes. Hew and Lo (2018) conducted a meta-analysis demonstrating improved performance in healthcare education through flipped learning, a finding echoed by Sajid et al. (2016) in Saudi Arabia. The model allows instructors to clarify misconceptions and provide real-time feedback during class, further enhancing understanding.

The approach promotes self-regulated learning by encouraging students to manage their learning independently, developing time-management and critical thinking skills (Linur & Mubarak, 2022;). Moreover, flipped learning supports collaborative learning, where students work together on tasks, enhancing communication and teamwork skills, as Zhu (2023) found in physical education settings.

Teachers also report greater satisfaction with flipped classrooms, as they can engage more meaningfully with students (Caviglia-Harris, 2016). By shifting from traditional lecturing to facilitating discussions, teachers create dynamic, responsive classrooms (Pierce & Fo, 2012).

Challenges in Implementing the Flipped Classroom Model

The switch to flipped learning has many problems. A big issue is that students need to manage their own learning, which can be hard for those used to regular teaching styles (JiMei, 2024). Some students might resist this method because they do not know the necessary technology or think their workload is getting heavier (Hew & Lo, 2018). Teachers must set clear goals and provide support to aid students in adjusting to this new way of learning (JiMei, 2024).

The quality of teaching materials is very important for this method to work well. Badly made video lectures or insufficient pre-class resources can make it hard for students to stay engaged (Mark, 2017; Zainuddin & Halili, 2016). Teachers have to juggle their teaching tasks while also creating engaging content, which can take a lot of time and need skills they might not have (Suwartini et al., 2021).

Access to technology is another major issue. Students from low-income families may not have reliable internet or devices, making educational gaps worse (Kashada et al., 2017). Schools should look for ways to provide technology access or consider using blended learning to help reduce these inequalities.

Teachers also struggle with the change from traditional roles to being guides for active learning. They may need extra training to apply new methods successfully (Nouri, 2016). Additionally, managing ongoing assessments and providing feedback along with their regular teaching tasks can be too much (Lo & Hew, 2017).

Lastly, flipped learning calls for a new look at assessment methods. Regular tests might not capture what students learn in flipped classrooms, where working together and thinking critically are keys (Nouri, 2016). Teachers need to create assessments that align with the goals of flipped learning to accurately track students' achievements.

Impact of the Flipped Classroom Model on Research Skills

The flipped classroom model fosters essential research skills through active and collaborative learning. It encourages students to take an active role in their learning, promoting independent thinking and self-regulation (Kiang & Yunus, 2021; Ying & Ayub, 2022). This autonomy allows students to explore topics in-depth, improving their research capabilities.

Collaboration is another key component of research skill development. The model encourages teamwork, idea-sharing, and discussions, fostering a research-oriented mindset (Jin et al., 2019). Students in flipped classrooms exhibit higher levels of engagement and responsibility, traits essential for successful researchers (Moffett & Mill, 2014).

The model's flexibility allows students to tailor their learning to personal needs, enhancing ownership of their education (Låg & Sæle, 2019). As Boevé et al. (2016) found, this leads to improved academic performance and more effective learning behaviors.

Technology integration in flipped learning supports research skill development by providing access to diverse resources. The use of digital tools enables students to explore topics beyond classroom limits, enhancing digital literacy - an essential component of modern research (Nouri, 2016).

Flipped classrooms also accommodate various learning styles, promoting inclusivity in research tasks (Yang et al., 2019). Additionally, the model encourages metacognitive skills, such as self-reflection and strategy adjustment, which are crucial for effective research (Zeng et al., 2017).

The flipped classroom model represents a significant shift in educational practices, emphasizing student engagement, collaboration, and self-directed learning. While the approach offers numerous benefits, such as enhanced academic performance, student satisfaction, and research skill development, challenges related to technology access, student resistance, and the need for high-quality materials must be addressed. Educators must adapt teaching strategies, assessments, and resources to ensure the model's success. With thoughtful implementation, the flipped classroom offers a promising strategy to develop the skills necessary for academic and professional success in an increasingly complex, information-rich world.

IV. Research Methodology

This study uses a convenient sampling method with 45 second-year English language education students from the Faculty of Foreign Language Teacher Education at the University of Danang - University of Foreign Language Studies, which took place between December 2013 and May 2024. The faculty was selected because the researcher works there, making it easier to conduct research and lessening logistical issues. The university has a strong technological setup and focuses on educational innovation, making it a good environment for trying new teaching methods.

The design of instructional videos is important in today's teaching, especially in higher education. Good video design follows Cognitive Load Theory (Mayer, 2021), which reduces unnecessary cognitive load so learners can focus on important content. Using multimedia elements like images and sound helps improve learning by addressing various learning styles and simplifying complex ideas (Eckhard et al., 2022). Another important rule is coherence—all information included should be relevant to minimize distractions (Mayer, 2021). Videos should also use signaling techniques to emphasize key content and guide learners (Giannakos et al., 2014).

Breaking material into short pieces is vital for keeping learner interest (Lo & Hew, 2017). Videos should follow the temporal contiguity principle, showing visuals and audio at the same time to improve understanding. Pre-training students on key concepts before they watch the videos can enhance comprehension, especially for complicated subjects. Practical aspects include making sure videos work on all devices, keeping them between 5-10 minutes long, and providing subtitles for all learners.

This study takes a mixed-methods approach, combining both quantitative and qualitative data to gather various perspectives on student views of flipped classrooms. Quantitative data is collected using Likert-scale surveys to evaluate aspects like teaching methods, interaction, teamwork, and self-directed learning. Additionally, qualitative data is obtained from focus group interviews, offering deeper insights into students' experiences with flipped classrooms and video lectures.

Using a mixed-methods approach provides triangulation, boosting the trustworthiness of the findings through verifying data from different sources (Powell et al., 2008). This method ensures a full understanding of student experiences, which is important for making effective interventions.

Participants

There is 46 second-year students in the Scientific Research Methods course. The students, who are 19 to 21 years old, come from various backgrounds in Vietnam. This variety helps in understanding different student experiences. Since the researcher is also the course teacher, it is simple to give out surveys and hold focus group talks. This situation helps build trust and make the data collection more reliable.

Course Structure

The Research Methods class uses a flipped classroom approach, mixing self-study before class with interactive activities during class. Learning materials, like video lectures and extra readings, are available on the Learning Management System (LMS). Students prepare for class by watching videos and thinking about what they learned, while class time is used for discussions, group work, and practical research tasks.

Students take part in group discussions and exercises to use research ideas. Teachers give feedback during class to clear up confusion, and classmates also provide feedback to promote critical thinking. After class, students reflect on what they learned, and they work on research projects throughout the semester to gradually use their skills.

Assessments in the flipped classroom include formative and summative parts. Formative assessments are quizzes, reflective writing, and participation in class. Summative assessments involve research proposals or small research projects, graded with clear standards like research methods, data analysis, and result understanding. This broad assessment plan aligns well with active learning goals.

Research Instruments

The survey used in this study is based on earlier work by Newman et al. (2016) and others. It includes 30 Likert-scale questions that assess how students feel about the flipped classroom. The survey has two parts: demographic details and views on the flipped classroom. A pilot test ensured the survey was clear and reliable, with a Pearson correlation coefficient of 0.87 showing its internal consistency. Experts provided feedback that resulted in small changes to better fit the course context.

Focus group interviews also support the survey by examining what students think about the clarity of video objectives, their self-directed learning experiences, and how multimedia affects understanding. Students share their thoughts on interaction quality, the feedback they receive, and give ideas for improving video content and course delivery.

Data Collection

Data gathering happened over a two-week period. Surveys were given during class to make sure students took part, while group interviews took place later. Groups of 5-7 students were involved in 45-minute talks, either in person or online, encouraging joint thinking about their learning experiences.

Data Analysis

Quantitative data from surveys is looked at using simple statistics, finding average values, standard deviations, and frequency counts to show main trends in how students feel. High average values suggest good feelings, while standard deviation shows how varied the answers are.

Qualitative data from group interviews is examined by looking for common themes, like how clear the video content is, how effective the multimedia is, and the level of student independence. Combining both quantitative and qualitative data through mixed-methods analysis checks quantitative trends against qualitative findings, giving a complete view of student experiences.

The flipped classroom model, which uses video lectures, has a lot of potential for improving student participation, independent learning, and research abilities. Even though there are issues like student resistance and access to technology, careful planning, training for teachers, and support from the institution can help overcome these problems. Using both quantitative and qualitative data gives valuable information for making flipped classroom methods better, helping both teaching and learning in higher education.

Findings and Discussion

This study shows that students view the flipped classroom model positively in the Research Methods course. Students noted that using pre-class video materials made them feel prepared for class activities. With a mean score of 4.05 (SD = 0.98), participants felt confident in completing tasks after watching the instructional videos. This is similar to Nouri's research (2016), which indicated that the flipped model boosts understanding through self-paced learning. Some students said having content access beforehand helped them engage more in class discussions. However, several students felt there was a need for more direct teaching in difficult areas. This matches observations from Flores et al. (2016), who said while the flipped model aids preparation, students might face challenges without live instructor support.

The study also points out how the model affects student independence. Survey results show that students felt they could control their learning pace and became less dependent on lectures, resulting in a mean score of 4.0 (SD = 1.05). This aligns with Nouri's findings (2016), showing that flipped classrooms promote self-directed learning by allowing students to manage their study timelines. Nonetheless, transitioning to independent learning was hard for some students. Several participants noted they had to rewatch videos to grasp difficult topics fully, indicating a need for more support. This is consistent with Cho and Kim's (2019) research, which highlighted that students might feel overwhelmed by independent learning responsibilities. While students appreciated the flexibility to study at their own pace, they expressed a wish for more structured help, like extra resources or regular check-ins with instructors.

Another positive aspect of the flipped model was its focus on collaboration. Students remarked that the format offered more chances to ask questions and engage with peers, reflected in a mean score of 4.1 (SD = 0.88). This supports Zhu's findings (2023), who noted that flipped classrooms encourage collaborative learning. Participants felt that preparing beforehand made them more confident during group activities, improving teamwork and discussions. Nouri (2016) also pointed out that flipped classrooms enhance social skills by creating environments for collaborative problem-solving. However, some students mentioned that focusing on group tasks meant less interaction with instructors, which could be a downside. This is in line with Lo and Hew's (2017) findings, which indicated that while flipped classrooms support student collaboration, they may restrict direct instructor engagement. To remedy this, students suggested adding more opportunities for individual consultations or online Q&A sessions.

Students stated that the flipped model boosted their motivation to engage with course content. With a mean score of 4.1 (SD = 0.95), participants felt that learning new material through videos before class made the experience more engaging and manageable. This agrees with Rachmawati et al. (2023), who found that the flipped model lessens cognitive load during classes, helping maintain motivation. However, some students found it hard to sustain this motivation, especially when managing multiple courses with pre-class assignments. This reflects Lo and Hew's (2017) findings, where additional workload in flipped learning can create pressure. Despite these issues, students recognized that using theoretical videos along with in-class practice helped them retain information better.

Video content quality became important for students' learning. Students gave a mean score of 4.2 (SD = 0.82) on the clarity and organization of the videos, saying they helped understand difficult concepts. These results fit with Mayer's (2010) multimedia learning theory, which highlights visual aids for better understanding. Students liked being able to pause, rewind, and rewatch videos to study at their own pace. However, a few said that while the videos helped, they sometimes struggled with topics needing more explanation. This connects with Nouri's (2016) argument that video learning is better with prompt instructor feedback. Some students suggested adding quizzes in the videos for instant feedback to improve understanding.

Flexibility and access were important features of the flipped model. Students said being able to watch videos on different devices, like phones, tablets, and laptops, made learning easier. This supports Zhu's (2023) findings that flexible resources meet different student needs. Students enjoyed the chance to study anytime and anywhere, making them more satisfied with the course. Still, some pointed out needing better time-management strategies to manage coursework. Even with the flexibility of the flipped model, some had trouble keeping up without more guidance. This shows that educators could improve the model by offering time-management workshops or study plans to help students organize their learning.

The flipped model also showed positive effects on critical thinking and problem-solving skills. Survey results show students believed the flipped method improved their critical thinking about the material (M = 3.9, SD = 0.95). This matches Swart et al.'s (2015) findings that flipped classrooms encourage deeper engagement by focusing on applying and analyzing during class time. Some students mentioned practicing concepts in class reinforced their learning, though some wanted more time for detailed exploration of complex subjects. This mirrors Lo and Hew's (2017) notes on the need for careful time management in flipped classrooms to enhance student involvement. Some suggested longer class discussions or extra problem-solving sessions could improve learning results.

Overall, satisfaction with the flipped classroom was high, with a score of 3.95 (SD = 1.10). Many students found the flipped method more engaging than traditional ones and liked being able to revisit content as needed. This agrees with Caviglia-Harris (2016), who noted students find flipped classrooms more fun and interactive. However, satisfaction levels varied, with some saying the model fit better for certain subjects. This indicates the need for adapting the flipped approach to the specific needs of different courses or disciplines.

The study's results connect with constructivist learning theories, especially Vygotsky's (1978) social constructivism, which stresses active involvement and teamwork in knowledge construction. Similar to Zhu's (2023) study, students valued the collaborative chances in the flipped model. Yet, as noted by Cho and Kim (2019) and Lo and Hew (2017), students faced challenges adjusting to self-directed learning demands. This highlights the need for structured support in such learning environments. The need to balance independence with organized support is crucial for student success.

To summarize, the flipped classroom model used in the Research Methods course has shown good results in improving engagement, teamwork, and self-control. However, it also brings difficulties related to workload, managing time, and the necessity for instructor feedback. Students generally appreciated the model and showed interest in using it more widely, yet they highlighted the need for more support systems. Educators should merge independent learning with structured help and modify the model to fit various disciplines. Adding interactive assessments, consistent feedback, and time-management assistance will make flipped learning more effective. If implemented carefully, the flipped classroom model can be an effective way to encourage student independence, critical thinking, and collaborative learning in higher education.

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