

Case Study on Use of “Back to the Future” in English Instructions for Engineering Students

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Abstract

This study presents an educational practice that integrates the American movie *Back to the Future*, directed by Robert Zemeckis, into English language instruction for engineering students in Japan. Participants included four classes from a Japanese college dedicated to training future engineers and one university class specializing in technical sciences. Using Google Forms, students from two classes that incorporated the movie into their English lessons provided their impressions. The students found movies valuable for improving everyday conversational skills, expanding vocabulary, understanding cultural and social contexts, and gaining insights into nonverbal communication. Post-viewing analysis revealed that while the students conducted detailed scene analyses using their engineering knowledge, their comprehension of English vocabulary and expressions remained equivalent to that of lower secondary to early high school students in Japan. The study concluded that the main insights gained from the movie were engineering-related, with limited progress in language acquisition. To enhance the effectiveness of using movies in engineering education, teachers should include previewing activities focusing on conversational expressions, vocabulary, and engineering concepts in their classes.

Keywords: American Movie, Engineering Expertise, English as a Foreign Language, Google Forms

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Introduction

The Ministry of Education, Culture, Sports, Science and Technology (MEXT, 2024) outlines its vision for national universities in its publication, *Policies for the Reform of National Universities*. It highlights the need for a future society that embraces sustainability, inclusion, and diversity, emphasizing that education should be structured around these core principles. The report also stresses the significance of undertaking comprehensive reforms to achieve these educational objectives.

In addition it aims to cultivate individuals with interdisciplinary and integrated knowledge across both the arts and sciences, while ensuring sufficient learning time and rigorous graduation standards.

In Japan, it is said that English education traditionally focuses on linguistic skills such as grammar and vocabulary, often neglecting the broader goal of fostering well-rounded English proficiency. To develop globally competent individuals, educators must not only enhance students' language abilities but also integrate subject-specific knowledge, such as engineering, into their English instruction.

Sakaue (2015) explored in the study that student engagement by applying text-mining techniques to analyze feedback on classroom activities. The research highlighted the importance of motivating students to learn and to enhance their learning outcomes. With the context of a 15-session English course, educators can focus on the four core language skills—listening, speaking, reading, and writing—while simultaneously fostering cultural understanding.

In this study, the authors aim to improve their management in usual classes by taking a look at students' free-text feedback collected during a course. The questions were given to identify insights for improving lesson design and classroom practices. By examining recurring themes and patterns in student feedback, the research seeks to develop strategies that address both linguistic and interdisciplinary educational objectives more effectively.

Methodology and Participants

This study incorporated the American movie *Back to the Future*, directed by Robert Zemeckis, into English language instruction for engineering students.

Participants included four classes of students at a Japanese college that focused on training future engineers and one university class specializing in technical sciences:

- At Kosen College A: 160 participants (total of 4 classes).
- At University B in the field of Technology: 22 participants.

At Kosen College A, the academic year is divided into two semesters, and English classes mainly focus on reading and listening skills. Among the 30 90-minute lessons conducted annually, two sessions were allocated to lessons that incorporated *Back to the Future*. Typically, classes are conducted using an authorized textbook without incorporating movies. The participants were all second-year students aged 16–17.

The class activities mainly included reading and listening exercises based on the textbook, followed by comprehension and practice problems. In addition, in the Computer-Assisted

Language Learning (CALL) classroom, students engaged in listening exercises, repeating activities, and shadowing activities, culminating in recording their voices and submitting them as assignments. While English presentation and writing activities were not included, basic exercises such as sentence rearrangement and fill-in-the-blank activities were partially incorporated into textbook-based lessons. Overall, the subject is characterized by strong reading and listening skills.

All four classes comprised students with varying degrees of proficiency, some of whom had difficulty learning English but demonstrated motivation to engage with the lessons. The class progressed without any significant challenges. Instructions for the movie-based lessons were provided orally by a designated teacher, and a teacher answered any questions raised by students before watching a movie.

In English classes at University B, teachers improve all four language skills, reading, listening, speaking, and writing. For instance, reading and listening activities are conducted using a textbook similar to the text used at Kosen College A. However, the textbook is a nonauthorized version that includes engineering-related topics. Writing activities involve composing short sentences as part of the class. In some classes, English presentations are mandatory, and students should engage in writing while preparing their scripts. In addition, in those classes, all students were required to deliver English-only presentations during the 15 lessons in a semester, and a teacher evaluated these presentations. The participants were all second-year students aged 19–20.

Among the 15 90-minute lessons per semester, two sessions were allocated to lessons incorporating the abovementioned movie. Students in this class generally have clear future goals, such as pursuing graduate studies, and demonstrate motivation for learning. However, several students struggle with English, and while classes proceed without significant challenges, maintaining motivation remains a challenge. Some students in the class had never experienced lessons involving movies, as revealed through an oral survey conducted by the teacher. Instructions for the movie-based lessons were provided orally by a designated teacher, and a teacher answered any questions raised by students in advance.

For both colleges, a teacher told their students to write their impressions of the lessons that used a movie by using Google Forms after each class. The questions were given to them in their native language (Japanese), and the students wrote their responses in Japanese:

1.工学的な観点で面白いと思った点について説明してください。(in Japanese)

Please explain what you find interesting from an engineering perspective.

2.印象に残った英語表現を記載してください。(in Japanese)

Write an English phrase or sentence that leaves a strong impression on you.

3.今日の授業について自由にコメントをしてください。(in Japanese)

Can you provide your comments on today's class?

These are standard questions typically used in regular English classes to hear students comment for teachers to improve their class management.

Data Collection

The authors reflected responses on Google Forms onto an Excel sheet. It focuses on the responses to three questions. Frequently mentioned keywords that students mentioned were identified through text search and manual review. The authors recorded the number of

respondents referencing each keyword. The Open-ended responses regarding impressions of the class were categorized into the following three themes:

- Comments related to English expressions.
- Comments related to posture or gestures (e.g., "posture").
- Other topics.

Responses in each category were counted. Then, frequently mentioned answers were identified. The author utilized the search function of an Excel sheet. Through this way, the authors were able to see the area that students focused mainly on. By examining the categorized feedback, the impact of the movie became evident. It would lead to better class management in English classes.

Activity

The book of ATEM (2012), it clearly showed that using the movie *Back to the Future* in classroom practice can facilitate conversation practice based on previously learned grammatical structures through worksheets. However, this approach puts an emphasis on the potential of using movies to support the acquisition of natural conversational skills.

The primary purpose of introducing movies in this study was not to engage in the meticulous research of English expressions but to encourage students to practice critical thinking during lessons. Moreover, the activities aimed to encourage students to reflect on the engineering technologies that were shown in the film. They also share their ideas and experiences of cross-cultural elements presented in the movie.

At Kosen College A, the lessons were conducted in a CALL classroom, while at University B, they took place in a traditional classroom setting. They watched the first part, which comprised approximately 70 minutes of the film. After viewing the part, a teacher told the students to submit their reflections on the lesson through Google Forms. A teacher showed the movie's second half in the following lesson, after which students once again submitted their reflections using the same method.

Results

In several classes, response rates varied between the first and second sessions. Additionally, as shown in Class 3 (Figure 1), while the response rates before and after the sessions were nearly identical, the overall response rate remained relatively low.

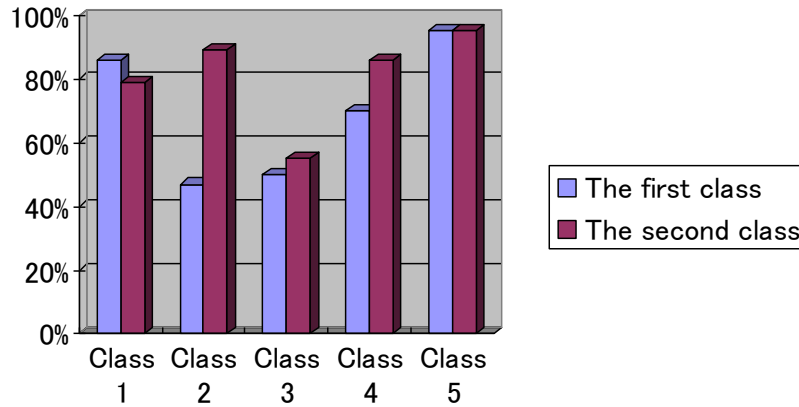


Figure 1: Response Rate for Feedback Across Classes

Table 1: After the First Class

	Class 1	Class 2	Class 3	Class 4	Class 5
the highest number	Plutonium, Fuel 10	Plutonium, Fuel 8	Time Machine, DeLorean 5	Time Machine, DeLorean 10	Time Machine, DeLorean 8
the second-highest number	electric current, electricity 3	Time Machine, DeLorean 4	Plutonium, Fuel 3	Plutonium, Fuel 6	Plutonium, Fuel 6

Table 2: After the Second Class

	Class 1	Class 2	Class 3	Class 4	Class 5
the highest number	Time Machine, DeLorean 9	Time Machine, DeLorean 17	Time Machine, DeLorean 10	Time Machine, DeLorean 4	electric power, lightning 14
the second-highest number	Plutonium, Fuel 5	Plutonium, Fuel 4	Plutonium, Fuel 8	Plutonium, Fuel 6	Time Machine, DeLorean 3

In this study, words related to “plutonium” and “fuel” were counted when they appeared as exact matches, and similar terms with closely related meanings were used in the context. Since students in Japanese wrote the comments, it was easy to determine contextual understanding.

For Question 1, across Classes 1–5, students consistently focused on and frequently mentioned terms such as “plutonium,” “fuel,” “time machine,” and “DeLorean.” This pattern remained essentially unchanged in the first and second sessions. However, in Class 5, after the later sessions, several students shifted their focus to terms such as electric power and lightning.

In addition, as for Question 2, responses varied considerably, making it challenging to identify clear trends. The English sentences mentioned by the students were generally of a

level equivalent to what Japanese students in Grades 8 through 10 would learn. Some students reported that they “could not catch” or understand the English dialogue in the movie. For Question 3, there was a significant trend in which references to the linguistic aspects of English and second language acquisition increased across three of the five classes, with six additional students commenting on these aspects. Conversely, the number of students who mentioned linguistic elements decreased in the remaining two classes. These two classes revealed that while some students recognized the importance of English language learning, others were more interested in the storyline, mechanical design of time machines, and other specialized fields.

The results of this study indicate that incorporating movies into English lessons at Kosen College A and University B effectively stimulated students’ motivation for future English learning. Teachers achieved this by engaging students in activities that encourage them to express their opinions using their existing engineering knowledge. Though students’ academic year and age are different, it could be curious that they draw similar perspectives from the same film. This would indicate that incorporating movies into English education can offer us meaningful insights in order to create future English education policies.

While this study focused on using movies, previous research by Fujita (2019) suggests that TV dramas, regardless of the student’s proficiency levels, can also be highly effective teaching materials. It allows dramas to be incorporated into English lessons as an alternative or supplementary resource. In addition, Kadoyama (2017) indicated that both English for General Purpose and English of Specific Purpose materials significantly motivated learners and led to statistically significant improvement in listening skills.

In light of these findings, it is evident that TV dramas, like films, can be valuable teaching resources that cater to various proficiency levels. These studies could suggest that English teaching materials including films, are suitable as listening materials. In other words, they would also potentially improve students’ listening skills. Additionally, creating complementary speaking and writing exercises and designing methods for analyzing these activities presents significant challenges for future research.

Post-viewing Analysis

The post-viewing analysis of students’ reflections revealed that students were able to interpret scenes from the movie from an engineering perspective based on their technical knowledge. However, their understanding of English vocabulary and expressions was limited to the level typically observed in Japanese lower-secondary to early high school students. This indicates that the need to enhance the practical aspects in English conversation activities as an important challenge for future curriculum development.

Conclusion

This study concluded that though the primary insights gained from the movie were engineering-related, there was limited progress in terms of language acquisition. To enhance the educational impact of film in English education at Colleges of technology, the study suggests that previewing activities should be introduced, focusing not only on engineering concepts but also on conversational expressions, vocabulary, and listening.

As a limitation, this study primarily focused on classroom practices rather than conducting a research-oriented investigation. Consequently, there were discrepancies in class size, the number of classes, and the timing and duration for feedback on written assignments in classes. Moreover, in some courses at Kosen College, the submission rate for feedback was relatively low. For future research, it would be beneficial to standardize these elements across both institutions. In addition, adopting unified participation practices, such as having at least one instructor observe all classes, could enhance the consistency of the research.

The classes in this study were conducted separately at two different schools. When teachers implement lessons for research purposes, it is essential to standardize survey questions and the timing of collection and conduct preliminary observations of the students' characteristics.

This study gave some insights into effective classroom management through examining students' reflections on English lessons using a film. From the results, future improvements in lesson design and future data analysis would be possible to boost students' motivation in future English learning in classes.

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