

Technology-enhanced Multimodality in Encouraging Student Interaction: A Paradigm of a Flipped Second Language Classroom

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Keywords: Technology-enhanced learning, Multimodality, Curriculum Design, Flipped classroom, Second language learning.

Abstract. With the rapid development of multimedia technology, the digital environment in learning has become an up-going trend, promoting new learning models to emerge. Educators and researchers must realize the potential of technology for engaging students in interaction and collaboration. With qualitative analysis, this paper provides a discussion of technology-enhanced multimodality applied in learning, and how would that be improved to promote student learning in second language classrooms. Rather than in a traditional face-to-face classroom, a modified flipped classroom paradigm is presented to demonstrate an alternative approach in achieving high-quality student interaction.

1. Introduction

The issue of choosing suitable digital tools and materials in the classroom has become a challenge for modern teachers. With the ability to achieve communication regardless of the time and space limitation, teachers and researchers have been long wondering how technology would spur student interaction. One of the most prevalent applications would be multimodality with devices and materials, which not only provides a learning context with authentic materials but also enables students to engage in various types of interaction, inside and outside the classroom. The goal of this research is to discuss ways in which technology-enhanced multimodality can be effectively used in promoting student interaction in second language learning classroom. This paper takes an improved flipping classroom model as an example to illustrate the principles and method of curriculum design and implementation.

2. Overview of technology Application in Education

The intimate integration of technology into people's daily life has never stopped being more ubiquitous each day. The usage of informational technologies crossed disciplines is drawing attention from social scientists and humanitians concerning new perspectives toward their research and practices. Among them, language educators and linguists seem to have been benefiting from this new trend in a more manifest way attributed to the prevalence of their work. Researchers of Second Language Acquisition (SLA) have long been pondering how technologies, with the potential to abasing distance obstacles and augmenting learning context, can enhance learning.

The early approaches use computers over traditional language learning. Typical methods of this kind includ but not limited to reading after tapes (input), showing pictures and videos (sense-making), speaking and writing with computers (output), and clicking to answer multiple-choice questions (assessment). However, these approaches are narrowed in scope due to their finite efficacy in different learning steps, and "no significant difference" in outcomes (Dunkel, 1991 and Pederson, 1987). Also, with the capability of bridge-building between people and places, technology could be the cure for lacking interaction in many learning environments for SLA. Sociocultural theories assert that students are better able to process knowledge when learning was developed in various forms of interaction (Lightbown & Spada, 2013), however, even though Computer-Assisted Language Learning (CALL)

has been accused as "overly technology-driven" (Egbert & Hanson-Smith, 1999, 2007), it ceases to function for maximum efficacy.

To maximum technology's potential in facilitating sense-making, how to choose suitable teaching materials appears to be the key question to ask. Multimodality theories argue not only how each model function in learning, but also how the interaction between different model serves to construct meaning for learners (Zhu, 2007). With that being said, three aspects of media selection can be taken into consideration: learning target, number of types, and purpose of technology. Multimodal materials should be chosen related to the target and content of learning since mishandle and unrelated materials could draw away students' attention and therefore interfere with their cognition process. Second, students' learning styles should be taken into the discussion of types of multimodality. The VAKTIG model (Reid, 1987) describes six of the most considered learning styles: Visual, Auditory, Kinesthetic, Tactile, Individual, and Group. Understanding learner's styles could help teachers in choosing effective types of multimodal materials, as well as to differentiate students. Third, multimodality serves to achieve different purposes in learning. Teachers and educators may use technologies to supply a learning gap, enhance a certain point, draw students' attention, create emotional resonance, and clear vagueness (Zhang, 2009).

To conclude, the development of technology has equipped educators and researchers with efficient tools in designing and enriching students' learning environment as well as promoting interaction. Emerged in respond to that, subdisciplines like CALL, and CMC have been integrated across formal and informal learning environments. With the facilitation of related techniques, multimodality learning materials should be selected and applied by using technologies in considering three aspects: learning target, number of types, and purpose of technology.

3. Flipped Classroom – an Inversed Paradigm

3.1 What is a Flipped Classroom

The Flipped Classroom is one of the most revitalized model by technology and multimodality as it weighs heavily on materials outside classrooms and interacting inside classrooms, therefore, it is selected as a further example. "Flipped Classroom" or "Inverted Classroom" is a pedagogy model that originated from the United States of America, which is practiced initially by two teachers at the Woodland Park High School, in 2007. In a flipped classroom, the students start the schema building process before the class with prepared materials from the teacher, and then participate in classroom discussions with questions and reflections. Predate this practice, Lage and Platt (2000) elucidate the concept and their research of "Inverted Classroom". They describe the implement of Flipped Classroom model as "events that have traditionally taken place in the classroom now take place outside the classroom and vice versa" (Lage and Platt, 2000, Page 32). For example, the step of lecturing inside classrooms is supplanted by instructional videos before the class; and the traditional way of discussing after the class is implanted inside the classroom.

3.2 How Does a Flipped Classroom Work?

Compared with the traditional classroom, the Flipped Classroom revitalizes the interaction which is of special significance for language learners as their languages are spontaneously tools for interaction. According to Lage and Platt (2000), there are two prominent benefits of this enhanced interaction: it helps clear up students' confusion effectively and is a continent for teachers to monitor students' performance and comprehension. In discussions with peers and teachers, students have more opportunities to engage in novice-novice and expert-novice interaction than in a traditional classroom. Besides, with modern technology, students can participate in computer-supported collaboration whenever and wherever they need through personal devices. Technology digitalizes and visualizes traditional teaching materials, and to better apply them, reconsiderations of relative teaching methods and models are crucial.

Another beneficial feature of the technology-enhanced flipped classroom, which overshadows the traditional classroom, is that it creates various types of interaction. The reason for that lies in its ability

to appeal to various types of learners (Lage and Platt, 2000). It is of a low possibility that learners with different learning styles experience equal qualities of learning through the same kind of interaction. But within a multimodal flipped classroom, language learners of different learning styles can choose one or several interaction methods that they like. Some of them may prefer online interaction over face-to-face communication, while some may prefer group work over pair work. As technology has developed, both the amount and the type of interaction have been pushed up to the next level, so does that of multimodal materials. As Alexander (1995) states, the new learning opportunities provided by multimedia are impossible with any other media.

3.3 Limitations and Possible Solutions

Still, the Flipped Classroom model requires further deliberation in practice. First, the plethora of workload and cost of preparing course materials and supplements could reduce the practicality of this model. One of the unique features that a flipped classroom has is the diversity of teaching materials. Yet, it is not as convenient for teachers as that for students as the chances that every teacher and school will have enough time to collect materials for students are slim. Even if modern technology has equipped instructors with free access to the Internet, certain student groups do not have any digital devices. One way to bypass that is by sharing. There are websites and organizations like ShareMyLesson and EdSurge that allow teachers to upload their resources at an online community. A collaborative e-portfolio is another alternative. For the lack of personal devices, schools could build computer labs for students to access digital materials, or selectively transforming computer-based materials on another media, such as television and PowerPoint.

Besides, a new model would naturally need time for students to adapt to. Students who are used to the traditional lecturing may suffer insecure when suddenly be granted with the initiative of their learning since their cognitive process weight largely on input by their teachers. To avoid the above-stated problem, worksheets can be applied in classrooms. Teachers could provide worksheets with questions of what they would like their students to notice, and in this way, students learn from the materials with questions, which helps them to concentrate, and scaffolds their understanding from an overall view of the logic and connection within the materials.

4. An Implementation of the Technology-enhanced Flipped Classroom model

As what has been discussed, technology-fostered multimodality facilitates interaction and differentiation in a flipped language learning classroom. However, between the two language skills that required more creative reflection, speaking and writing, the importance of interaction in writing is often neglected. Having good writing skills is prominently necessary for second language learners as it is widely used in both academia and professional fields. Collaborative writing allows students to learn from their peers and this interactive learning is now enhanced by the Internet and software, such as Google doc. Besides, writing courses can be more smoothly flipped than courses of other language skills since writing inherently requires a preparation process that could be facilitated with multimodal materials. Based on that, this paper exemplifies how to use the revised model through the curriculum design of a English Language Learning (ESL) class of writing in a university context.

In this eight-week course, ESL undergraduate students mixed in majors would learn and practice how to write a research proposal in English. The reason why the training focuses on research proposals is that firstly, the ability to conduct research is crucial for university students in conducting their thesis and their future work in academia; secondly, the time cost by a complete research project vary from projects and disciplines. Learning happens in three stages in this curriculum (see Figure 1): pre-class, in-class, and post-class. And in each stage, teachers, and students interact through technology-enhanced multimodality.

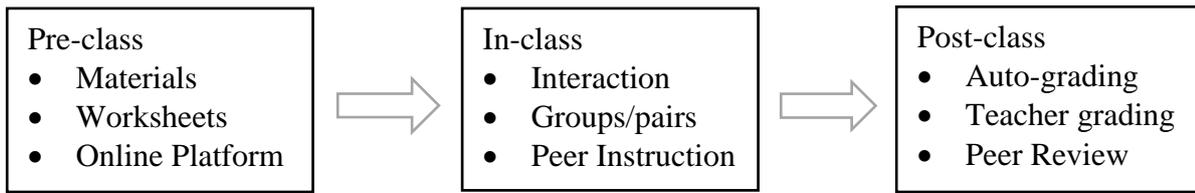


Fig. 1. Course design of the stated ESL writing class.

4.1 Pre-class

Teachers' primary role on this stage is preparing materials and supplement aiming at the learning target. Teachers would upload multimedia materials with questions each week on an online community built within a platform like Dropbox or Google Drive. To manage students' participation and pointing out key knowledge in the materials, each student is required to fill out a worksheet and upload it on the platform. Questions on the worksheet can be divided into three aspects: key points in the materials, prior knowledge, and reflections. According to their purpose, the materials content three aspects: instructions, samples, and inspirations. Of each part of a research proposal, instructions on how to write, samples of writing, and other materials to inspire students' creativity would be provided. Besides, this online community should be enabled for students to access through their personal devices, like cell phones and personal computers.

Students' role is to start schema building by using the provided materials. After filling out the worksheets, they would have meaning formed by the materials and their prior knowledge. Then they could read their classmates' worksheets and reflect in forums and chat-boxes, or conduct their own search of more materials they recognize as related to the topic and upload them on the platform. After the students' decision of whether they would like to complete their research proposals individually, in pairs, or groups, group meeting videos regarding the post-class materials and their writings should be posted on the online platform arranged by topics.

4.2 In-class

The teachers' role in this stage is to participate and monitor students' interactions. Besides what questions to ask students, worksheets can be used as references to predict what questions students would ask. To ensure sufficient interaction, at least two rounds of group or pair discussions should be planted in each class, one for students' questions, and the other for the teacher's question. Students are grouped or paired up according to seats, majors, or grades. After each discussion, each group or pair report their results and exchange ideas with the teacher. Other than answering student's questions and fostering inspiration, multimedia can be used to demonstrate and visualize knowledge by using PowerPoint, micro-lectures videos, and educational games, etc.

Students should finish their work on the online platform before coming to class. In their interaction with peers and teachers, they would take notes of what would benefit their own learning. In this case, the notes should be helpful for their research proposal. Other than that, they would also be asked to keep notes on their group members' performance for a final peer-review.

4.3 Post-class/Assessment and Reflection

The assessment of this course contains two parts: formative assessment and summative assessment. Formative assessments of a student's work require evaluations from the teacher and his/her peers. The teacher would grade students' writings after the second week's meeting when they start their research proposal. Also, students could rate their group members on the online platform, and the platform would calculate the grade of each student with a preset score ratio of each homework.

As for the summative assessment, the grade includes two parts: the final research proposal, and the presentation of it. Students can choose to do group work with peers who share the same topics or to complete the proposal by themselves. The final papers would first be uploaded on the online platform for an automatic grading system to check spelling and grammar errors, then the teacher would review and grade them for student's writing skills. Ideally, the platform would also include anti-plagiarism algorithms, and natural language copra to give suggestions for improvement. Each research

proposal would be presented in front of the class at the last class meeting and received oral and written reflections and suggestions from other students and the teacher.

4.4 Discussion

Writing classes can be complicated. Like in any other classes, teachers wonder what output students should be able to give out in order to prepare input targeting to that. This target-oriented design strategy can be more difficult for writing teachers. Thanks to modern technology, this process has become easier. Narrowing down in course planning, there are two ways for teachers to start researching appropriate materials, top-down and bottom-up, and they can be used together as a closed-loop. Top-down means to start the teaching from the beginning of building up the course. The first step is to collect related materials and then sift them again considering the student's needs. Like what has been asserted above, three aspects should be taken into consideration before the application: learning target, number of types, and purpose of technology. The bottom-up strategy overlaps with techniques of Data-driven Learning (DDL), Target-oriented Learning (TOL), and learning analytics. It functions in modifying the material selection by analyzing students' behavior and formative assessment to check if they are heading to the learning target and if they are not, how could teachers help. Fortunately, modern technology has been facilitating teachers on that, leveraging existing technologies on scaffolding learning.

5. Summary

The purpose of this study is to improve the quality of interaction with ESL classrooms by integrating technology-enhanced multimodality. Interaction is particularly significant for language learning as language is inherently interactive, and modern technology has a positive impact on promoting and facilitating interaction inside and outside classrooms. Although interaction has been stated as the process within where learning happens, traditional classroom constraints students' collaboration and interaction within a limitation of time and space. Rather than team works without teacher's monitoring, students could achieve high-quality collaboration after a facilitated preparation in a carefully designed classroom. Today's classroom requires higher effectiveness for both teachers and students to deal with new knowledge boosts, and technology has a huge pedagogical potential of achieving that. Also, the ever-evolving quality of technology would continue to push researchers and educators to create and use new tools in learning environment design. Learning has already been free from the classroom step by step, from blended learning, to distance learning, online learning, and place-based learning. And with information science and artificial intelligence, learning has become quantifiable for analyzing. The demand for new technologies to participate in learning would only continue to grow.

Acknowledgement

I would like to expressed the deepest appreciation to the universities I have attended, which not only equipt me with knowledge but also guided me on the path of being a researcher. All my teachers and friends deserved to be thanked here as they have inspired me with their illuminating suggestions and ever-positive spirit in adversity. Great gratitude also goes to my families who have supported and encouraged me during this research and every other days in my life.

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