From Paper to Screen: Exploring the Effectiveness of Digital Charts in Teaching Modals

Lungguh Halira Vonti[1], Pujiati[2], Mullynanda Pontiaka[3], Artika Riestiyaningtyas[4],
Muhammad Pandu DaniAji[5]
[1, 3, 4, 5]Universitas Pakuan
[2]SMAN 1 Bogor
Corresponding E-Mail: lungguh@unpak.ac.id

Abstract

Providing a good chart makes a good impact as well for the learning, especially students' understanding. This classroom action research aimed to enhance senior high school students' understanding of English modals through the use of multimodal digital chart media. The study was conducted in two cycles at a senior high school in Bogor, involving 31 students of XI grade. Each cycle consists of: planning, action, observation, and reflection. The study employed a mixed-methods design; collecting data through pre-tests, post-tests, and documentation including feedback from the English teacher and students' test scores analyzed via Quizizz. In the first cycle, static printed charts were used. Due to unclear layout and small font size, students' engagement and comprehension remained limited, as reflected in the average post-test score of 62%, up from 50% in the pre-test. In the second cycle, digital charts were integrated into PowerPoint presentations, which offered clearer visualization and better accessibility. This resulted in improved understanding, with average scores rising from 66% in the pre-test to 71% in the post-test. The result shows that well-designed digital charts combining visuals, keywords, and structured content can significantly improve students' grasp of abstract grammatical topics like modals. The study recommends incorporating visually engaging, relevant, and culturally appropriate digital media to support English language teaching and to foster deeper cognitive engagement in the classroom.

Keywords: *modals, multimodal chart, digital media, classroom action research*

Introduction

Indonesia's current curriculum emphasizes developing students' creativity, critical thinking, and independent learning (Arifin, Febriani, & Anasruddin, 2021). It is reasonable that the current curriculum, Kurikulum Merdeka, takes Bloom's framework to decide students' development in learning. Bloom (1956) suggested that there are three aspects of learning: cognitive, affective, and psychomotor. There are six learning levels in the cognitive domain: remembering, understanding, applying, analyzing, evaluating, and producing (Anderson, Krathwohl, & Bloom, 2001 in Chandio et al., 2016).

Those levels mean that students need to achieve them one at a time to master the highest level, which is creating. Bloom's revised taxonomy (2001) was also implemented in English learning for senior high school. It is found in one of the English high school textbooks that Bloom's cognitive domains were reflected in all language competences (Edi et al. 2024). It implies that to be able to use English and create something using English, students need to understand first what they learn.

Developing students' understanding of English is supported by many factors, one of which is the media. In teaching and learning, media are everything that is used to transfer knowledge in order to stimulate students' thought, feeling, attention, and interest (Sadiman, 1996). One of the media commonly used in learning English is a chart. A chart is a picture of some organized, short information. It gives simple information to understand the materials (Nurjayanti & Ririen, 2024).

Providing a good chart makes a good impact as well for the learning, especially students' understanding. Deciding on a good chart should be followed by some factors to consider. Bowen (1994 in Nurjayanti & Ririen, 2024) stated that there are five factors to determine a good chart, those are:

1) Appeal
   The picture and information that are displayed on the chart should be appealing. It means that the chart should attract students' interest and imagination.

2) Relevance
   The chart should contribute to the learning goals. If the learning goal is to make students understand, then the chart is supposed to be informative and interactive.

3) Recognition
   The chart's key characteristics should align with students' background knowledge and cultural understanding. In the learning process, significant features mentioned could be the content and keywords. Those features cannot be completely new information for the students; otherwise, the chart cannot facilitate students' in adding to the knowledge they have.

4) Size
   It is surely that the chart should be in a large and visible size so all students in the classroom can focus on the information immediately.

5) Clarity
   To minimize confusion, the details must be seen, have a strong outline, keywords, and contrast in color and tone.

The use of charts in learning English is widely implemented among education levels in Indonesia. Based on the previous research, wall charts could help junior high students enhance their vocabularies and its meaning, spelling correctness, and pronunciation (Patria, Sudarsono, & Rosnija, 2020; Mufidah & Khofifah, 2024). Another study found that using chart effects improves students' writing and speaking skills at the university level (Nurjayanti & Ririen, 2024). However, studies focusing specifically on enhancing students' understanding of English modals remain limited, particularly in the context of senior high school education. Therefore, this study offers classroom action research on the use of charts for learning modals at the senior high school level.

Method

The research method is Classroom Action Research (CAR). This study was held for two cycles, each cycle consisting of one meeting in the classroom. According to Kemmis and McTaggart (1988), later synthesized by Sukardi (2013), a cycle of Classroom Action Research (CAR) is divided into four steps: (1) action planning, (2) action implementation, (3) observation, and (4) reflection. The participants are 31 students of the eleventh (XI) grade at one of the senior high schools in Bogor, West Java. The research design that is applied in this study is mixed-methods. It is because the data was collected quantitatively and analyzed by using qualitative descriptive methods.

The data collection techniques are tests and documentation. The test serves as a tool to collect data for assessing the actual abilities of the research subjects (Yuliastuti et al., 2023: 37). The tests are given at the beginning and ending of each cycle/meeting. The pre-test and post-test were used to see how much using charts helped improve students' understanding. Documentation is used to strengthen the data by providing concrete evidence and a visual representation of the research implementation as it occurs (Daryanto, 2014: 6 in Sulfemi et al., 2021: 113). In this study, the documentation includes test results from Quizizz, the charts, and the English teacher's feedback.

The data analysis method follows the qualitative approach outlined by Miles, Huberman, and Saldana (2014), involving three main steps: data condensation, data display, and conclusion drawing. Qualitative data analysis is an ongoing and cyclical process. It is also more flexible and allows the researchers to understand the data more deeply and contextually.

Results

Students' understanding is determined from the score or percentage on the Quizizz. There were 10 pre-tests and post-tests. Quizizz shows the numbers of students, correct and wrong answers, and the total percentage. The total percentage is taken from the total points from the correct and half-correct answers divided by the total points for the quiz and the total number of students.

Based on the Quizizz results, the students got 50% understanding on the pre-test of the first cycle. In the first cycle, there were 31 students who participated among 34 of them. The learning objective was to find the modals in texts and their meaning. On the post-test, the students got 62%.
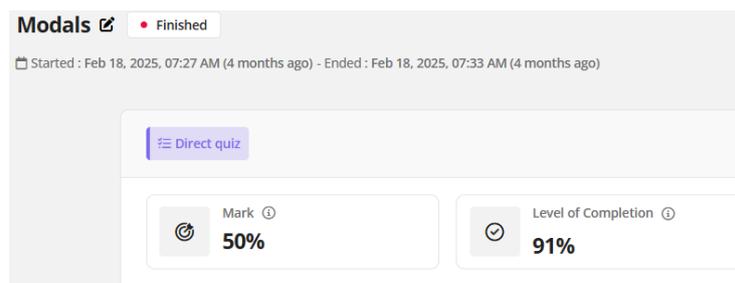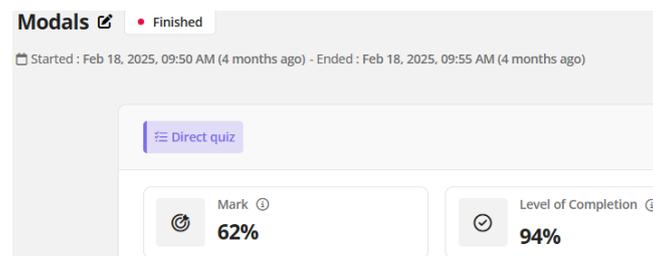

Figure 1: Pre-test cycle 1 result

Figure 2: Post-test cycle 1 result

After conducting data condensation, the researchers will display only the results of the students who participated in both the pre-test and post-test. So, there were 31 students who participated in the first cycle.

Table 1: Participants of pre-test and post-test cycle 1

No	Students	Pre-test Cycle 1	Post-test Cycle 1
1.	AMP	10	3
2.	IPAN	8	10
3.	TCM	8	7
4.	RWR	8	7
5.	ASR	7	7
6.	MM	7	8
7.	GABS	7	5
8.	WD	7	2

9.	CAA	6	6
10.	AF	6	10
11.	VRZ	6	10
12.	ZKA	6	10
13.	NNIM	6	7
14.	AFM	6	6
15.	ANF	5	8
16.	FFN	5	8
17.	BRP	5	7
18.	AFD	5	7
19.	SCH	5	7
20.	AH	5	7
21.	NPM	5	2
22.	NA	5	8
23.	KRBP	4	7
24.	ASNS	4	3
25.	NY	4	5
26.	AJS	3	8
27.	MGFN	3	10
28.	NFN	2	3
29.	MANR	2	3
30.	BG	2	5
31.	NSS	2	7

In the second cycle, the learning objective was that students are able to analyze the function and meaning of modals in sentences or texts. In addition, teachers had clearer charts to guide the students in learning about the modals' functions (ability, permission, advice, possibility, and obligation). In this cycle, the number of students who took the pre-test and the post-test varied due to time constraints and students' attendance. On the pre-test, the percentage was 66%, and on the post-test, it was noted as 71%.
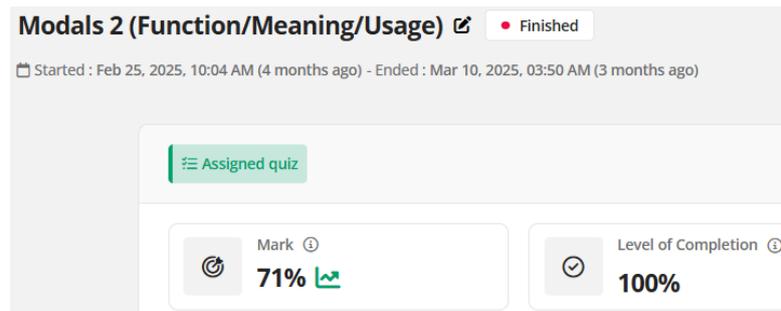

Figure 3: Pre-test cycle 2 result

Figure 4: Post-test cycle 2 result

Among 29 students who participated on the pre-test, there were 12 of them who made it into the data display below.

Table 2: Participants of Pre-test and Post-test Cycle 2

No	Students	Pre-test Cycle 1	Post-test Cycle 1
1.	MGFN	10	10
2.	NA	9	2
3.	BRP	8	10
4.	AFD	8	7
5.	AJS	7	10
6.	NSS	6	8
7.	ANF	5	10
8.	ASR	5	6
9.	GABS	5	5
10.	SCH	5	7
11.	NY	5	7
12.	WD	4	7

Discussion

In this paper, students' understanding means there is an increasing percentage from the pre-test to the post-test. Both pre-tests and post-tests are the instruments to find out participants' understanding of the learning material (Yaumi and Damopolii, 2014). It is shown in the first cycle test results that the students had a lack of understanding. As described by Kang (2015), a chart consists of a large card or paper with images, text, or diagrams that teachers can attach to a wall or board for presentation or practice.

This differs from the practice of the researchers, as based on the English teacher's feedback, the chart used was unclear, and the font size was too small. That condition also affected the students' lack of learning involvement. Patria et al. (2020) also pointed out that the chart served as a medium intended to replace the projector for teaching language (one of them is vocabulary). However, the classroom used in this study was already equipped with a functional projector. Therefore, the researchers aimed to enhance the instructional media used for the students.

Additionally, a chart is a type of diagram that uses visual symbols to present facts or ideas in a way that makes it easier and more engaging to explain, compare, contrast, or summarize information (Mohanty, 2017). With this understanding, a clearer chart was implemented as the media in the second cycle to summarize and contrast the various functions and meaning of modals, such as ability, permission, advice, possibility, and obligation.

In the second cycle, the researchers used a digital chart, which was displayed on the PowerPoint presentation. Digital charts help both teachers and students to present and understand the materials. It is pointed out that the advancement of technology has strengthened the role of English across various fields such as medicine, engineering, and especially education, where English is essential in that area (Ilyosovna, 2020: 23 in Nurjayanti & Ririen, 2024: 416). Implementing more than one medium, like charts, text, and technology, allows teachers to involve students through various modes of learning. This combination of media is commonly called multimedia. Warschauer and Healy (1998) noted that the use of multimedia facilitates the integration of language skills, as the variety of media supports the combination of listening, speaking, reading, and writing in an activity.

Figure 5: Paper chart on the whiteboard in the Cycle 1
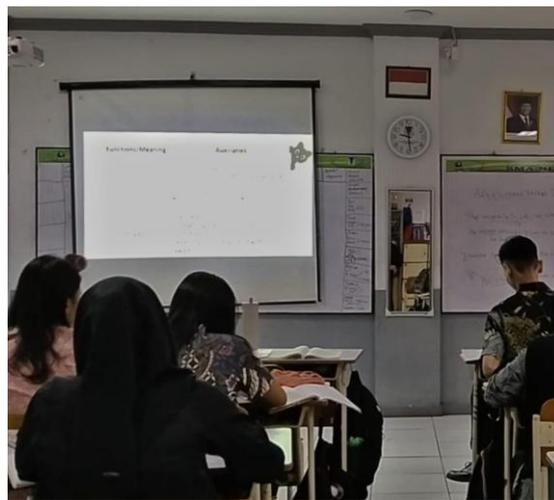
Figure 6: Digital chart in the Cycle 2

Figure 7: The look of the digital chart in the Cycle 2 that was shown on the PowerPoint presentation.

Another research study about the impact of technology-based environments by Rostami, Akbari, and Ghanizadeh (2014). They used PowerPoint presentations and the World Wide Web and proved that Smart Schools Programs have a positive influence on students' reading comprehension ability and retention of reading materials (Ghanizadeh & Razavi, 2015). Considering that today's students are digital natives, integrating technology into the current curriculum is an effective way to attract their interest, capture their attention, increase engagement, and reduce boredom (Prensky, 2001; Jones & Cuthrell, 2011; Guo, 2013 in Numonova, 2024).

Conclusion

This classroom action research was conducted to improve high school students' understanding of English modals through the use of chart media. The results from two cycles showed a steady improvement in students' comprehension. In the first cycle, the use of static and unclear charts limited student engagement and affected their ability to identify modals in context. After revising the media into clear,

digital charts in the second cycle, students demonstrated better understanding, reflected in the increase of test scores from 50% to 71%.

The use of multimodal digital charts, which combined visual design, color coding, and structured information, enabled students to process grammatical concepts more effectively. This finding emphasizes the importance of well-designed learning media that align with students' cognitive levels and learning needs. Teachers are encouraged to utilize varied, accessible, and appealing media to support the teaching of abstract topics such as Modals.

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