Educational Potential of Student-Generated Visuals for Learning English as a Second Language in the Age of Artificial Intelligence

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Abstract

The study explored the educational potential of the application of student-generated digital visual content for learning English as a second language (ESL) by undergraduate students enrolled in the course Foreign Language which is actually Introduction to Legal English. This study used a mixed-methods approach. The researchers designed a quasi-experimental design to examine whether the students' creation of visual content, supported by structured use of artificial intelligence (AI), could improve second language learning outcomes, increase motivation, and promote critical engagement with digital tools. The experimental group was tasked with creating personalized visual learning materials. The applied approach was structured in several steps, from creating simple forms including infographics and comparative charts to poster presentations and digital video passion projects. The algorithm for collaboration with AI and the work with specific features of AI-generated materials was applied aimed at making a student a critical consumer of this content and mitigating potential drawbacks of using AI. To assess the learning outcomes after the intervention, the post-test was administered, which revealed that the studied instructional design had a positive impact on language development across all aspects checked. The questionnaire, which included both open-ended and closed-ended questions, investigated students' perceptions of the applied methodology and faced challenges. The findings showed that students perceived integrating visual creation and structured AI-supported activities into English language learning as beneficial for language skills development, boosting motivation and interest, and the advancement of digital literacy.

Keywords: AI, learning English as a second language, learning outcomes, motivation, student-generated digital visual content

Foreign language education in the digital age is being revolutionized with unprecedented speed as a response to modern demands and challenges. One of the latest requirements for language teaching in higher education is to train language learners to be competent contributors to a digitally and culturally complex workplace environment (Dressen-Hammouda & Wigham, 2022). It means that there is a need to combine teaching linguistic aspects with digital, multimodal, and communicative practices. Considering the psychological characteristics of modern students who eagerly navigate in the world with multiple forms of media, prefer interactive content, social and collaborative learning, and are highly adaptable to new technologies, language educators try to find new methods to keep pace with current requests. The integration of multimodal techniques requires intensive attention to the work with visual content and helps address the complexities of real-world interactions and prepare students for them. The importance of this approach can be seen in language teaching curricula of several countries, such as China (Zhong, 2024), where viewing was introduced as the fifth skill alongside reading, listening, writing, and speaking. *English Curriculum Standards for Compulsory Education* in China regard viewing as skills of understanding meaning by making use of graphics, tables, animations, symbols, and videos in multimodal texts (Ministry of Education of the People's Republic of China, 2022). Today students are not only exposed to teacher-generated visuals they are also actively involved in the generative learning process. The constructive potential of student-authored visual content for students' language acquisition as well as performance, engagement, and motivation has been studied in various research studies (Guenier, 2023; Jiang & Ren, 2020; Lecumberri and Pastor-González, 2020). Despite the interest of scholars in this technique, limited attention has been given to the impact of the introduction of AI on the creation of visual content by students and their language development. Addressing this gap, the present research aimed to enhance the understanding of how the engagement of students in creating visuals and the use of a structured approach to AI could benefit language learning, motivation, and interest. The practical recommendations for managing both the challenges and advantages of AI in language education can help to inform more effective and responsive practices of teaching English as a second language.

Literature Review

The Psychological Considerations of Digital Multimodal Content in Education

One of the foundational theories guiding the design of educational multimedia is the Multimedia Learning Theory by Richard Mayer (Mayer & Fiorella, 2022). Most works related to visual tools and cognitive processes at the present stage, in one way or another, refer to his 12 principles of multimedia learning, which are considered an important resource for curriculum developers, methodologists, and educators. Among them is the modality principle, which states that people learn better from visuals and spoken words than from visuals and on-screen text. Other principles, important in this context, are the dual-channel assumption principle that individuals possess two distinct channels for processing auditory and visual information, spatial contiguity principle stating that text and visuals should be presented close together on the screen to maximise learning, and the temporal contiguity principle pointing out

that students learn better and build meaningful connections when words and pictures are presented at the same time rather than sequentially (Mayer & Fiorella, 2022).

Modern research on psychology tries to enhance the understanding of integrating visual media effectively into learning to improve retention and support comprehension. Schoenherr et al. (2024) observed that various visualization exercises and strategies enhance students' visual abilities and strategic knowledge thus contributing to both short-term and long-term learning. According to Patel (2025), visuals influence short-term memory by engaging quick and unconscious information processing as well as active memorization. Goujon et al. (2022) highlight that meaningful images positively affect long-term memory by making information easier to store and retrieve. The improvement of deep cognitive processing of information, leading to better academic performance, was reported due to the multimedia content (Lv et al., 2024; Mangaroska et al., 2021; Stankovic et al., 2018). However, cognitive overload was observed when students completed multimodal composition tasks (Hellmich et al., 2021). In modern research, little attention has been given to empirical studies on effective teaching strategies to make learning both stimulating and cognitively manageable.

Student-Authored Multimodal Content in Education

Digital multimodal composing (DMC) was applied in second language learning as a multi-skill practice. The technique aimed to engage students in the "use of digital tools to construct texts in multiple semiotic modes, including writing, image, and sound (to name a few)" (Hafner, 2015, p. 487). In such a situation, students became not only consumers of learning materials but also digital designers who often had to work in collaboration with peers as the learner-generated content was supposed to be shared with other learners to support learning (Lecumberri & Pastor-González, 2020). Even though various research reported the beneficial impact of this activity (Guenier, 2023; Jiang & Ren, 2020; Lecumberri & Pastor-González, 2020), there remains a need for further exploration of effective instructional strategies that can allow educators to optimize the use of multimodal projects to maximize student engagement and learning outcomes as well as sustain self-regulated learning.

Insightful observations were made by Lecumberri and Pastor-González (2020) who studied content acquisition through multimedia content in two stages. First, they gave the students the assignment to create a poster presentation showing a given template. This activity helped to develop basic skills in data management. Second, they assigned a task to create a video, a more complex task, which provided the opportunity to enhance creativity and critical thinking. The researchers considered that these digital practices helped to master language, explore cultures, and make the process meaningful. The suggested approach is of notable interest as it manages to enhance students' engagement by gradually increasing the cognitive demand and making the learning process both accessible and intellectually stimulating.

Jiang and Ren (2020) examined the use of DMC in second language learning and revealed contrasting perspectives between teachers and students. Teachers primarily employed this technique to support the acquisition of linguistic forms, whereas students perceived digital

modes as more engaging and effective for self-expression. The researchers argued that these different perspectives could create at the micro level internal barriers to student investment and at the macro level external barriers, as students' digital and multimodal competencies risk being undervalued in traditional assessment. These findings show that educators should consider the meaning-making potential of multimodality and refrain from restricting students' engagement.

Integrating AI tools in English Language Teaching

The use of AI technologies in language teaching has attracted significant attention in recent years. Kostikova et al. (2024) studied the process of a new language course creation using AI. Mananay (2024) reported that AI is actively used to enhance language instruction through interactive simulations, adaptive learning, and individualized feedback. The improvement of learners' motivation, engagement, and attitude as well as a decrease in learning anxiety, were noticed by AlTwijri and Alghizzi (2024). The ability of AI to create more personalized and engaging learning experiences was observed (Ahmed et al., 2024; Islam et al., 2024; Lee, 2024; Levy & Windmann, 2020).

Studies indicate that AI can improve language learning. AlTwijri and Alghizzi (2024) and Mohammed & Mahdi (2025) demonstrate that AI tools positively influence various aspects of language learning, including receptive and productive skills, vocabulary acquisition, grammar, comprehension, and intercultural competence. Guo and Wang (2024) highlighted that AI-based strategies enhanced writing skills by providing individualized instruction and timely, personalized feedback, leading to improved accuracy and overall language proficiency. Zhang et al. (2024) reported that interacting with AI supported speaking development, as students explained concepts to chatbots in a dialogical exchange. The beneficial impact on speaking competencies was also noted by Du and Daniel (2024) and Yang et al. (2022).

At the same time, researchers observed various challenges connected with the integration of AI in language teaching. AI-powered writing tools can impact academic integrity (Roe et al., 2023). The risk that over-reliance on technology can potentially diminish the human element in teaching was acknowledged by Mohebbi (2024). Mohamed (2023) emphasized the essential role of teacher presence in second language learning, arguing that AI tools alone cannot foster deep understanding, creative language use, or mastery of linguistic logic. Another problem is the information reliability issue as AI-generated content can be incorrect, and references can be invented. Asscher and Glikson (2023) highlighted that even the most sophisticated translation tools may misunderstand the context or provide wrong meanings of field-specific terminology. Gerlich (2025) also warns that heavy dependence on AI can lead to a decrease in students' critical thinking skills and problem-solving abilities. These findings show that further studies are needed to investigate approaches to working with AI tools critically, design targeted instructional strategies for their educational application and effectively utilize their capabilities. This is the gap the researchers wanted to address in this study.

Considering the findings of previous studies, the researchers put forward the hypothesis that learners' participation in constructing digital visual content in learning English as a second

language may have a beneficial impact on students' learning outcomes as well as interest and motivation if instructional methods are carefully designed to train students to critically engage with multimodal and AI-generated content. The work aimed to answer the following research questions:

RQ1: Does participation in the creation of visuals and a structured approach to using AI contribute to enhanced learning outcomes in foreign language education?
RQ2: How do students perceive the impact of creating visuals on their language development, motivation and interest?
RQ3: What are the main difficulties students experience in the process of creating visuals and working with AI?

Methodology and Methods

This study used a mixed-methods approach, combining quasi-experimental design, pre and post testing, and a questionnaire, that included open-ended and closed-ended questions, to investigate the impact of visual content creation and structured use of AI by students on foreign language learning outcomes as well as to explore learners' perceptions and challenges. These approaches were informed by previous studies, such as quasi-experiments (Chastnyk et al., 2024; Reichardt et al., 2023), pre- and post-testing (Kumar, 2021; Pan & Sana, 2021), and questionnaires (Bang, 2024; Sajko, 2024).

Participants

The research was conducted during the 2023–2024 academic year at Yaroslav Mudryi National Law University. The participants (N = 114) were first-year undergraduate students enrolled in the compulsory academic course Foreign Language which is actually Introduction to Legal English. The sample included 61 female and 53 male students, aged from 17 to 19 years. A purposive stratified sampling strategy was applied to ensure equivalence in English language proficiency across the experimental and control groups. At the beginning of the academic year, all students enrolled in the course took a standardized English language proficiency test (pre-test). Based on the test outcomes, 6 academic groups with nearly equal proficiency levels were chosen from a total of 10. These 6 groups were randomly assigned to either the control group (3 groups; N = 56) or the experimental group (3 groups; N = 58). The study was conducted in compliance with ethical standards for research involving human participants. Ethical approval was obtained from Yaroslav Mudryi National Law University before the commencement of the quasi-experiment and data collection. Prior to participation, all students were informed of the research purpose and participated voluntarily.

Research Design and Tools

To address research question 1 (RQ1) about the impact of the suggested instructional design, including visual content creation and structured use of AI, a quasi-experimental design was used. Initial comparability of the control and experimental groups was ensured by

administering the pre-test. The groups showed nearly identical pre-test scores across all criteria. Then the independent-samples t-test was conducted on the pre-test scores to verify that there were no statistically significant differences between the control and experimental groups before the intervention. To confirm the validity of the t-test results assumption checks were performed. The results of the Shapiro-Wilk test indicated that all variables were approximately normally distributed, all p-values were above 0.05. The findings of Levene's test showed that all p-values were above 0.05, which indicated that variances between groups were equal for all language skills. In the independent-samples t-test all p-values were above 0.05, which confirmed that there were no statistically significant differences before the experiment. The results of the independent-samples t-test on the pre-test are shown in Table 1.

Table 1

Results of the Independent-Samples T-test for the Control Group (CG) and Experimental Group (EG) on the Pre-Test

Criteria	CG Mean/SD (n=56)	EG Mean/SD (n=58)	t-value	p-value
Vocabulary	6.9 ± 0.700	6.8 ± 0.690	−0.953	<0.344
Reading skills	22.1 ± 0.710	22.2 ± 0.690	−0.872	<0.386
Listening skills	13.2 ± 0.680	13.3 ± 0.670	−0.651	<0.516
Speaking skills	13.0 ± 0.650	13.1 ± 0.640	−0.712	<0.478
Writing skills	12.8 ± 0.600	12.9 ± 0.610	−0.889	<0.376

To assess the learning outcomes in the control and experimental groups after the intervention, the post-test with a maximum score of 100 points was conducted at the end of the semester. It was the standard two-part final assessment test used in the course. The first section included a multiple-choice test, checking vocabulary knowledge and reading skills, and the task to assess writing skills to write a summary of a given text on one of the studied topics. The second part checked listening skills in the form of true/false and multiple-choice questions, and speaking skills, a monologue, on the programme topics. The results of the control and experimental groups were collected, analysed, and interpreted based on descriptive statistics and inferential statistics such as an independent samples t-test by means of the Statistical Package for Social Sciences (SPSS). The assumption tests for normality and homogeneity were conducted to ensure independent samples t-test validity. In addition, Cohen's d was calculated to assess the practical significance of the observed results.

To answer research question 2 (RQ2) and research question 3 (RQ3) concerning students' perceptions of the applied approach involving visual content creation and structured use of AI in the process of learning English as a second language, a mixed-format questionnaire was designed and administered to the experimental group after the completion of the course. To ensure content validity, the draft version of the questionnaire was developed following the objectives of the research and adapted according to previous studies (Hoa et al., 2022; Ranganathan et al., 2024; Taherdoost, 2022). It was reviewed by three associate professors of

the Foreign Languages Department who evaluated the clarity and relevance of the questions. Based on the feedback, some questions were reworded. A pilot questionnaire was conducted with the participation of 5 students to understand the comprehensiveness of the questions, finally adjusted and presented to all participants. Completion of the questionnaire implied informed consent. All responses were anonymous and confidential. Participants had the right to skip any question or withdraw at any time. Data were stored and analysed following institutional ethical guidelines.

The administered closed-ended questionnaire included 3 blocks of questions concerning motivation and interest (part A – questions 1-3); learners' perceived progress in language proficiency (part B – questions 4-5); and problems and difficulties in the preparation of visual learning content (part C – questions 6-7). Questions 1,2,3,5 were designed by the authors of this research according to a 5-point Likert scale (Handelsman et al., 2005) from strongly disagree to strongly agree. Questions 4, 6, and 7 required respondents to select one or more options to obtain more reliable answers and assess their consistency. Closed-ended responses were analysed quantitatively, tabulated, and presented in percentages.

The open-ended questionnaire questions were developed in advance based on the study objectives and research questions to obtain students' more detailed opinions on motivation, language development, difficulties, and interaction with AI. The responses were examined using thematic analysis to identify recurring themes that complemented the quantitative finding. The researchers used a manual coding method, carefully read all the students' responses to the open-ended questions, identified key ideas, and assigned codes to them that reflected the content. The codes were then grouped into broader thematic categories that corresponded to the research questions.

This questionnaire contained 4 open-ended questions (OQ):

OQ1: Can you comment on your interest and engagement when you had to create visual material independently, and not just work with ready-made materials from the teacher? How did it affect your interest in the task? Did it become more exciting or difficult?
OQ2: What language skills did the activity help you improve?
OQ3: What difficulties did you encounter independently preparing learning material?
OQ4: Did you use AI in preparation for the assignment? What are the advantages and drawbacks of this experience?

Experimental Teaching Design

During the course, experimental teaching involved delivering the course materials outlined in the syllabus of the discipline, through the intensive use of multimodal teaching methods to the students in both the experimental and control groups. In the control group, only teacher-generated digital visual aids were applied. Whereas, in the experimental group, besides working with the tasks related to the provided multimodal materials, students were also given assignments to create their own digital multimedia content.

Teacher-Generated Digital Multimodal Content

Teacher-generated digital multimodal aids were employed during the two semesters. They included infographics such as visual displays of words, word and concept mappings, charts, diagrams, slides, maps, graphs, wordlists, flashcards, and word clouds, ready-made multimedia materials like audio, video, and animation, and AI-generated videos. These visual materials were produced with the help of different online digital tools, including word cloud generators such as Tagxedo, Tagul, Word It Out, VocabGrabber, Wordle, and WordSift,; visual dictionaries or thesauruses similar to Visuwords, Wordart, and Visual Thesaurus; quiz-makers and interactive tools Kahoot, Quizlet, Hot Potatoes, and Free Online Surveys; online vocabulary games Vocabulary and Quizlet; and AI content generators GPTchat; JasperAI; Rytr; Simplified, Twee, and Invideo. The intensive use of these materials was aimed at developing language skills, enhancing comprehension and retention, fostering authentic language learning, as well as improving communication skills and learners' engagement. Moreover, these materials also served as an example for students regarding how to create content.

Student-Generated Digital Multimodal Content

The tutors asked students to create multimodal content based on the instructions and target materials. The tasks were supposed to foster English language use, promote critical thinking and creativity, enhance interaction and collaboration, help develop digital literacy as well as teach students to produce content useful in the real-world professional context. The work with digital visuals produced by learners included three main stages.

Stage 1. During the year (two semesters) students were given the assignments to create infographics, comparative charts and posters to represent, analyse, compare, and summarise the learning material. For example, using the infographics students were to describe the main functions of prosecutors in various countries. Meanwhile, other students had to spot differences between the duties of these professionals in different states. Then the group discussion was organised. Students were also asked to evaluate works of others and provide constructive feedback on the language used, logical flow of information presentation, effectiveness, and creativity. The infographics created by students about the functions of prosecutors in different countries at different stages of criminal proceedings are shown in Appendix A.

Working on the topic Modern Legal System, students were given the home assignment to create a comparative chart to analyse any two legal systems according to the given criteria. During the lesson, they worked in several groups and created a common list of the main differences and similarities of the studied legal systems using their charts. The group that provided the most comprehensive and well-researched list of the differences and similarities in the studied legal systems won the competition. The work with these simple visuals was aimed at training for more complex tasks they completed at further stages. The designed comparative chart is shown in Appendix B.

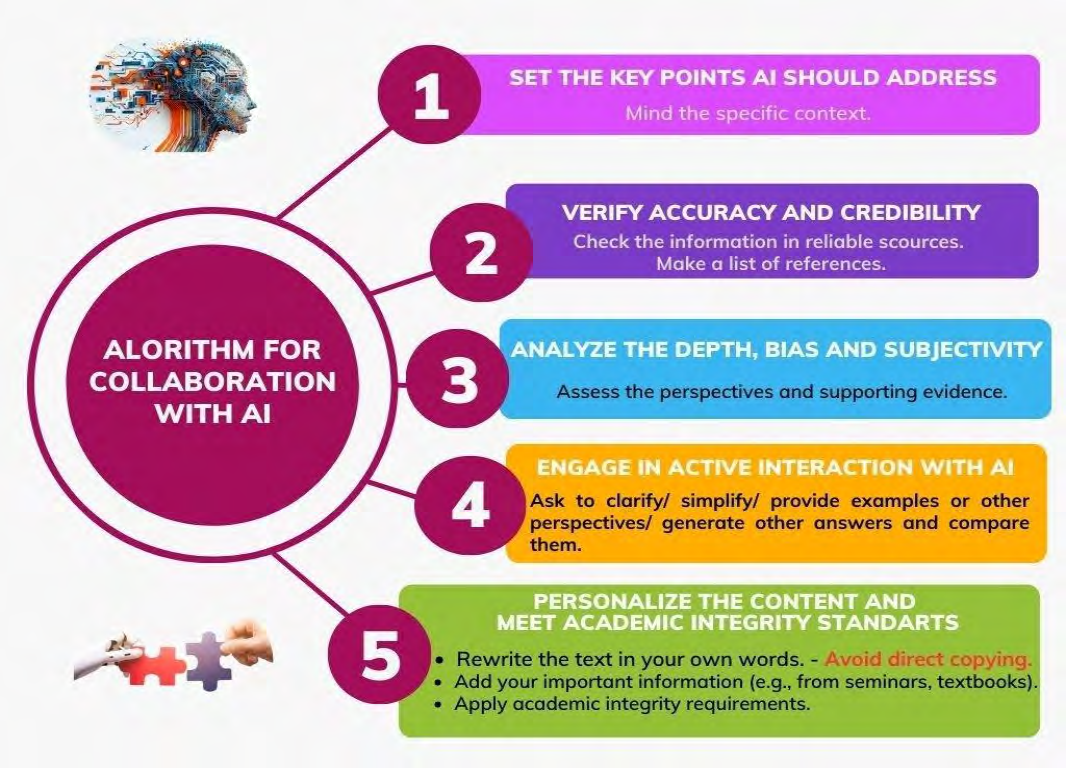
Stage 2. During the first semester, students were given the project to create a poster presentation on the topic "A Notorious Criminal". Typically, the following online tools were utilized: Canva, Genially, Visme, Beautiful.ai, Slidebean, and others. This type of visual was chosen for its potential to enhance language learning in an interactive and engaging way by integrating reading, writing, speaking, and listening skills. Wallengren Lynch (2018, p. 6) considered a poster presentation to be a creative way to help students "crystallize their arguments and help scaffold knowledge". A student-created poster presentation is shown in Appendix C.

Special attention was paid to the use of AI-powered tools. The tutors, being aware of the possible threats, suggested the tasks to make students critically analyse AI content, criticize and filter information, interact with AI, go beyond the mere copying of the AI-generated content, and better assimilate the material. For this reason, specific characteristics of AI-created texts were presented to students in the form of the checklist infographic and analysed on the provided example. While working with the visuals created by students later during the semester, learners were asked to identify features of AI-generated content if present in the text.

Then students were given the algorithm containing the step-by-step approach to the collaboration with AI that they had to follow to work critically with AI-created texts. The diagram with the structured approach is shown in Figure 1.

Figure 1

Algorithm for Collaboration with AI



Stage 3. In the second semester, students were assigned to create a digital passion video project. They were allowed to choose independently problematic issues that they were already passionate about and connected with one of the curriculum topics. The project implementation steps including the project marketplace method are described in detail by Mykytiuk et al. (2023). The following free generators were usually used: Pictory, Lumen5, InVideo, Canva, Animaker (for animated videos). The process of planning and implementation of the product as well as the final presentation in class was accompanied by tutors' support, thoroughly observed in terms of the objectives of the research. The screenshots of video projects are shown in Appendix D.

Results

Language Learning Outcomes Revealed in the Post-Test

To answer research question 1 (RQ1) about the impact of the proposed instructional design, including visual content creation and the structured use of AI on students' learning outcomes, the post-test was administered. The results of the Shapiro-Wilk test indicated that all variables were approximately normally distributed, all p-values were above 0.05. Furthermore, Levene's test for homogeneity of variances revealed that all p-values were greater than 0.05, which suggested that the variances between the control and experimental groups were equal across all language skills. The utilised independent-samples t-test revealed the following results shown in Table 2.

Table 2

Results of the Independent-Samples T-test for the Control Group (CG) and Experimental Group (EG) on the Post-Test

Criteria	CG Mean/SD (n=56)	EG Mean/SD (n=58)	t-value	p-value
Vocabulary	7.2±0.727	7.6±0.632	−3.150	<0.001
Reading skills	22.9±0.685	23.10±0.684	−2.033	<0.022
Listening skills	13.6±0.725	13.9±0.739	−2.190	<0.015
Speaking skills	13.8±0.681	14.1±0.711	−2.308	<0.011
Writing skills	13.3±0.622	13.8±0.638	−5.085	<0.001

As it is demonstrated in Table 2, there was a difference between the test achievement scores of control and experimental groups according to all five checked criteria. According to the vocabulary criterion $t = -3.150$, $p < 0{,}001$; the mean score of the experimental group achievement (7.6) was higher than the control group's achievement (7.2) score. According to the reading skills criterion $t = -2.033$, $p < 0.022$; the mean score of the experimental group achievement (23.10) was better than the control group's achievement (22.9) score. According to the listening skills criterion $t = -2.190$, $p < 0.015$; the experimental group achieved a higher mean score (13.9) compared to the control group's mean score (13.6). According to the

speaking skills criterion $t = -2.308$, $p < 0.011$; the experimental group outperformed the control group, achieving a mean score of 14.1 compared to 13.8. Since the p-values for all assessment criteria were below the significance threshold of 0.05, it can be concluded that the approach applied in the experimental group improved students' performance, confirming the initial hypothesis on the effectiveness of the proposed methodology.

The analysis of the post-test results using Cohen's d revealed that the studied instructional design had varying degrees of impact across different language skills. The most substantial improvement was observed in writing skills ($d = 0.79$), indicating a large effect size and suggesting a strong practical benefit of the intervention. Moderate effect sizes were found for vocabulary ($d = 0.59$), listening ($d = 0.41$), and speaking ($d = 0.43$), while reading skills showed a small to moderate effect ($d = 0.38$). These findings support the conclusion that the experimental approach contributed positively to the improvement of learning outcomes, especially in productive skills, and highlight the potential value of integrating visual and AI-supported activities into English language teaching.

Students' Perception of the Impact of Creating Visuals and Working with AI

Closed-Ended Questionnaire

The closed-ended part of the questionnaire was designed to quantitatively measure how students felt about their motivation, English language progress, and the challenges they faced while creating visual materials. It helped identify common tendencies in students' experiences aligned with the study's goals.

Part A of the closed-ended questionnaire assessed students' motivation and interest in developing visual materials during English classes. Table 3 presents the quantitative results reflecting students' perceptions related to Research Question 2.

Table 3

Questionnaire Results on Students' Motivation and Interest

A. Motivation and Interest	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Q1: Was it interesting for you to develop educational material yourself, rather than receive ready-made material from a teacher?	28%	37%	26%	8%	1%
Q2: What motivated you the most?					
• the opportunity to understand the topic more deeply	10%	30%	28%	20%	22%
• the opportunity to choose tools	5 %	45%	30%	15%	5%
• a sense of responsibility for the quality of materials that will be used in class	15%	20%	35%	20%	10%
• the opportunity to be creative	50 %	25%	10%	15%	5%
Q3: Do the difficulties in the task-generating process affect your desire to use this type of work in the future?	9%	45%	30%	12%	4%

Question 1 was asked to evaluate students' acceptance of the suggested approach and the level of interest. The results demonstrate that most of the students (65%) agreed that their direct participation in the process of creating the learning content in English positively affects their engagement and motivation. Only 1% expresses strong disagreement about the rise of interest and motivation to study. 26% of respondents hesitated about the attractiveness of the approach.

Question 2 was aimed at understanding what exactly seemed more interesting to the students. The researchers believed that working with AI, the ability to choose tools and be creative would seem more attractive to students, which turned out to be true with approximately 55% and 30% respectively supporting the ideas. It also appeared that students were interested in explaining and conveying information to their classmates in an easily understandable way, feeling responsible for the result (35%). They also indicated their desire to understand the topic more deeply (40%). The participants said that they took great pleasure in the process of creating visual content design, which is reflected in the figures (75%).

Question 3 was designed to understand how optimistic and interested students felt about participating in this activity in the future taking into account that they could have difficulties of completing the assigned tasks learning English as a second language. As can be seen, a high result (54%) indicates the students' readiness to directly participate in the preparation of visual materials. At the same time, 30% of respondents expressed a neutral position, and a small number (4%) spoke out against it.

According to the results obtained from the motivation part of the questionnaire, it can be affirmed that there was a high degree of motivation among the students in the process of creating and generating learning content. Apparently, most students showed a positive degree of interest in contrast to only a few students, who reported negative results towards this activity.

Part B of the closed-ended questionnaire focused on students' self-assessment of improvement in language skills and knowledge as a result of engaging in visual content creation. Table 4 and 5 present the quantitative results of respondents' self-assessments on the development of specific language skills related to Research Question 2.

Table 4

Questionnaire Results on the Impact of Creating Learning Materials on Language Acquisition

B. Improvement in Language Skills and Knowledge	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Q4: Do you agree with the statement: "Creating learning material helped me learn the language better than if I had received ready-made material from a teacher"?	14%	40%	30%	11%	5%

The answers to Q4 revealed that most students saw the benefits of their activity as 54% of participants agreed that generating learning material made them gain language skills and knowledge. As can be seen in Table 4, only 5% strongly disagreed that their English language knowledge had increased, while 25% were not sure about it.

Question 5 was aimed at investigating which specific English skills were successfully increased, according to the students' opinion. The research showed that students considered the activity and experience useful mostly for increasing vocabulary, better understanding of written texts, development of speaking qualifications, and constructing and paraphrasing sentences. As Table 5 shows, 81% of respondents confirmed that they gained more knowledge in terminology and its use. The answers revealed that most students saw the benefits of their activity for reading comprehension (86%) while 48% of respondents stated that they began to understand speech better, especially when it was accompanied by visual aids. Another 51% expressed confidence about better speaking. Improving pronunciation was indicated by 36% of students. Particular skills of paraphrasing and structuring the text were highlighted by 45% of participants.

Table 5

Questionnaire Results on Students' Assessment of Language Skills Progress

B. Improvement in Language Skills and Knowledge	%
Q5: Which language skills do you think have been improved in the process of creating learning materials? (You can select multiple options.)	
• I have learned new words	81%
• I have improved my grammar	35%
• I have learned to write better texts	31%
• I began to speak and pronounce words better	36%
• I have become better at constructing and paraphrasing sentences	45%
• I feel more confident in speaking and presenting information	51%
• I have improved my ability to understand presentations by my groupmates	48%
• I have a better understanding of written texts on the studied topic	86%
• I learned nothing	0,1%

Referring to the obtained results it can be deduced that students were less confident in acquiring new skills of writing texts and pronunciation with 36% and 31% respectively of participants responding positively. It should be noted that the only exception was the individual who expressed the opinion that he had learned nothing new.

Part **C** of the closed-ended questionnaire examined the difficulties students encountered while independently preparing visual materials. The results presented in Table 6 illustrate the respondents' evaluation of the most complicated aspects of the process and provide evidence relevant to Research Question 3.

Table 6

Students' Assessments of the Challenges Involved in Creating Visuals

C. Difficulties in Preparation	%
Q6: What difficulties did you encounter when independently preparing materials? (You can select several options)	
• Searching for and selecting information	7%
• Interacting with AI to obtain the desired results	36%
• It was difficult to summarize and structure the material	44%
• Difficulties in formulating final ideas in a foreign language	65%
• Creating visual content	87%
• Sound recording or presentation of material	80%

As can be seen from Table 6 finding information did not cause any particular difficulties (7%), presumably due to the availability of various online assistants. After respondents had selected relevant information on the topic, their next step was to identify aspects and criteria for compiling the main content, by interacting with AI, which caused difficulty for 36% of

participants. Fully 44% of students noted that structuring and summarizing the material was also rather challenging. The aspect of expressing thoughts in a foreign language to get a final product was highlighted by a fairly large number of students (65%). Despite the availability of many services for creating and editing texts based on AI, a large number of students experienced difficulty in creating high-quality, informative text that corresponds to the target audience. As was stressed in the motivation section of the questionnaire, dealing with creative design appeared to be the most motivating activity but technical visual implementation became, according to respondents, quite a difficult task (87%). One of the most difficult aspects, according to students, was their voice-over and presentation of the finished material to the audience (80%). The successful implementation of the task required both linguistic and communication skills as well as analytical and presentation skills, which the English language learners do not fully possess.

Open-Ended Questionnaire

An open-ended questionnaire was administered to gather detailed, qualitative feedback from students about their experiences of independently creating visual content. It was designed to provide deeper investigation into the research questions and complement the quantitative data gathered from the closed-ended section. The researchers acknowledged that English was not the participants' first language and took this into account when interpreting the responses.

To address Research Question 2, open-ended question 1 (OQ1) Can you comment on your interest and engagement when you had to create visual material independently, and not just work with ready-made materials from the teacher? How did it affect your interest in the task? Did it become more exciting or difficult? was asked to examine students' interest and engagement in independently creating visuals, focusing on how this approach influenced their motivation and interest. The researchers considered that English was a second language for the learners.

According to the responses to OQ1 of the open-ended questionnaire, the experimental group participants indicated that learning through creating visuals was motivating. One student commented, "I liked the process. I tried my best to create something good. I understood that my groupmates would look at the chart and more easily understand the difference. It should be bright and well-formatted. It made me make efforts, but I'll be glad to do it again" (S1). Most respondents share the opinion that the most liked part of the activity was creating a design for visuals: "I really enjoyed creating the poster, choosing the slide design" (S2); "I really wanted to impress my classmates and make the visible text appear bright and clear" (S3); "There were a lot of platforms to choose from. I tried two. I wanted the video to look good with effects" (S4). Nevertheless, some students doubted their interest: "I have got so many assignments to prepare, why should I deal with tables or cards if the teacher can do it for us" (S5).

Open-ended question 2 (OQ2) 'What language skills did the activity help you improve?' sought to identify which specific language skills students felt were improved through the activity, answering Research Question 2 by evaluating the perceived impact on language development.

Students' self-evaluation concerning increasing their language skills and knowledge is reflected in numerous comments to OQ2, such as, "I'm sure I'm improving my vocabulary! I had to go over those basic terms so many times while making the clip, and I even asked AI for the pronunciation" (S6). One participant commented that "during the preparation, I learned specific terms. Even if I didn't know them before, I could memorize them automatically because when making charts and graphs and even the video, I saw them plenty of times" (S7); "It was a great way to memorize new vocabulary without just cramming" (S10). Some participants expressed improvements in grammar. "I learned to formulate more precise requests to receive good answers, and when I wrote something grammatically wrong, the bot corrected me, and next time I tried my best to write better" (S8).

The participants also shared how they had improved their comprehension of written and spoken materials: "I used to struggle with listening, but now I can catch more words and phrases." (S2); "When I made my diagrams, I had to reread definitions and multiple times, besides I read mostly the same information expressed differently, so now I don't panic when I see long texts" (S11); "When I saw information on the diagrams or charts I could understand complex topics more simply" (S8).

Most participants expressed their experience of generating learning content positively highlighting that this activity helped them be more confident about constructing and paraphrasing sentences: "I knew I'd have to summarize everything in English to accompany the graphics, and I had to express the same idea in different ways so that ChatGPT could finally understand me; now I feel I'm just an expert in paraphrasing" (S12); "I had to rewrite sentences until they sounded natural. I had to phrase ideas clearly" (S5); "When I worked on captions for my visuals, I had to shorten and simplify sentences" (S3); "I learned to paraphrase because I couldn't just copy long definitions" (S12).

The rationale of OQ 2 was also to figure out if students benefit from their activities for better discourse management. Most interviewees were not certain about the effectiveness of the work (51%) but reported that they became more engaged, which made them participate in communication more freely. "I had to describe my visuals out loud, and that made me use new words automatically" (S7); "I repeated phrases again and again, so they stuck in my memory" (S14); "After revising so much of the information from different sites I encountered the same formulations, so when explaining the visual, it was enough for me to express my idea" (S13); "I now understand that probably I have become more confident in writing independently" (S4). There was just one participant who told the researchers that he had not learnt anything new. Most students, however, reported improvement in at least one aspect of their language skills.

Open-ended question 3 (OQ3) 'What difficulties did you encounter independently preparing learning material?' focused on the challenges students faced while preparing their visual content, helping to answer Research Question 3 by exploring the most complicated aspects of work with tools. When the students described the difficulties at each stage of the work step by step, they primarily pointed out the challenge of creating a unique visual that would not be similar to those automatically created by AI. The participants also specified the difficulty in

selecting the necessary content: first, it was necessary to highlight the main key points, then find reliable sources, summarize the information, and structure it. To do that, most turned to AI and had to explain the context in which certain concepts were to be used.

Next, the students described the difficulties with the technical implementation of the project, which, according to most participants, was the most energy-consuming. They indicated the following technical difficulties in the process of preparing the task when creating visuals: working with software, including graphic and video editors and voicing the video. This is evidenced by the students' comments: "Everything was difficult! But it was very interesting. The most difficult thing was to technically design the task, choose relevant pictures, etc." (S14); "I had troubles with CapCut it took me so long to figure out the tool!" (S15); "Finding good images that matched my topic was difficult" (S16); "It was necessary to select suitable icons, files so that everything would look great and impress my classmates" (S17).

Voice recording for the video also posed several challenges, according to students' statements. It required both technical execution and correct intonation and pronunciation: "Recording my voice was the hardest part—I had to rerecord it many times" (S18).

The most difficult moment, as described by the students, was the preparation for presenting the finished work in class. At this stage of the work, the students had to repeat the material, rephrase sentences, think through and simplify constructions, and get ready to answer potential questions: "I had to go over my material so many times before presenting"! (S19); "Thinking about presenting in class made me nervous because I wanted to make sure everyone could understand me" (S20); "I had to simplify my sentences so my classmates could understand everything easily, and it appeared harder than I thought" (S21).

Open-ended question 4 (OQ4) Did you use AI in preparation for the assignment? What are the advantages and drawbacks of this experience? asked about students' use of AI in preparing the assignment and their reflections on its benefits and drawbacks, directly addressing Research Question 3 by exploring the critical interaction with AI and its influence on the learning process. To comment on OQ 4, the participants described their experience in the process of creating materials beginning from the instructions they received from the teachers before starting the task, they narrated as follows: "The problem was also to make the assignment look like our own work and not AI-generated. We were given detailed explanations that we had to present the unique work, which meant reworking what had been created by AI if we use it" (S22); "The tutor gave us clear instructions and immediately warned us that we would have to rephrase, simplify, and change everything so that each work would be distinctive, and not just follow AI suggestions" (S23); "I was afraid that my work would look similar to others, so I tried to express my thoughts differently" (S25); "The teacher not only warned us not to copy but also described the next steps" (S26).

More participants admitted that they had used AI for creating visuals and also stated that preparing, revising, and filtering information to generate the visual product, was very helpful but not easy. Thirty-six percent of students described the process of interacting with AI tools

as challenging. Nevertheless, several participants voiced that they had to persistently apply the right strategy, and as a result, they could memorize complex notions unconsciously. “Sometimes I got angry because I didn’t understand what I needed. I got a very stupid and primitive answer so I had to explain the task clearly and the term as well. I did but it showed me too complicated and detailed information. To give AI good instructions I had to google the definition and even history (I mean the difference between Civil and Common law), I asked my classmates, and of course, we got the answer but we had to rephrase it and make it more precise. Sometimes I even had to start a new chat with new instructions” (S20).

The students highlighted the convenience of using AI while preparing the assignments: “Thank God nobody blames me for using ChatGPT, at least we worked openly” (S2). A group of students described their learning experience enthusiastically: “We were given the task to create a comparative table on the topic of Barristers vs. Solicitors. First, we had to determine the format of the table and the criteria by which they should be compared. To do this, we had to look through the textbook text again and then apply to Google and ChatGPT. There was a lot of information, we had to select and shorten it so that the table included clear and understandable wording. I chose the criteria: Duties; Work Scope; Clients; Right of Audience; Education & Qualification. We entered the wording into the table based on these criteria. This was the main part of the work; the rest was a matter of technique. AI helped us with the visual design, after completing it, we added a couple of icons and reviewed the material. In principle, it was interesting and not extremely difficult. Everything worked out!!!”

Generally, most participants expressed that integrating their efforts into creating visual content was not simple. They admitted that there were challenges in the process of working with operating the technologies and content itself but the dominating quantity of respondents stressed the engagement in the activity and more confidence about the progress in the language acquisition.

The analysis of both closed- and open-ended questionnaire responses indicated that students in the experimental group generally perceived the activity of creating educational visual content as engaging, stimulating for learning, and educationally effective. The responses to closed-ended questions demonstrated that the activity supported the development of key English language skills, including vocabulary acquisition, reading, and listening comprehension, and increased speaking confidence. The open-ended questionnaire responses further highlighted the significant role of critical engagement with AI-generated content in facilitating language development. Rather than relying on AI passively, learners demonstrated an active process of evaluating, modifying, and personalizing the language material to produce original visuals. This process involved making linguistic choices, restructuring content, and clarifying meaning, which contributed to deeper comprehension and greater language awareness. At the same time, participants noted specific challenges, particularly in critically selecting appropriate content, using digital tools effectively, and presenting their final products in class, also emphasizing that revising, filtering, and adapting information to make it appear authentically their own, rather than AI-generated, required significant effort. Overall, the findings provided support for the hypothesis of the study and helped address the research questions.

Discussion

This study contributes to current research on multimodal language learning (AlTwijri & Alghizzi, 2024; Lv et al., 2024; Monika, 2022; Mudinillah et al., 2024; Park, 2024) by focusing on the educational potential of using student-generated visuals and students' critical engagement with AI-generated content. While previous studies confirmed the benefits of DMC activities (Guenier, 2023; Jiang & Ren, 2020; Lecumberri & Pastor-González, 2020), limited attention has been given to empirical studies on teaching students to critically process AI-generated content in English language education. The present research addresses this gap considering the highlighted challenges connected with the integration of AI in language teaching (Gerlich, 2025; Roe et al., 2023) and the drawbacks of AI-produced materials (Asscher & Glikson, 2023). This study focused on how learners, following the proposed strategy, could actively select, interpret, and adapt AI-generated content to produce unique visual materials.

The applied approach was structured in several steps to gradually increase cognitive demand to make learning stimulating and manageable, as was suggested in earlier studies (Lecumberri & Pastor-González, 2020). To enhance students' engagement, emphasis was placed not only on language acquisition but also on the creative and critical approach to the production of visuals in line with the prior research (Jiang & Ren, 2020). Following the previous studies that highlighted the positive impact of composing visuals by students on the learning process (AlTwijri & Alghizzi, 2024; Mohammed & Mahdi, 2025), the researchers found that this process may enhance language acquisition, particularly vocabulary development, reading, speaking, listening, and writing skills. Interestingly, the post-test results showed that the most substantial improvement was observed in writing skills development, which can be attributed to the employed algorithm of critical processing, paraphrasing, and restructuring materials suggested by AI. Even though students reported a more significant influence on vocabulary, reading, and speaking development. Participants also noted improvements in digital literacy, presentation skills as well as motivation, creativity, and critical thinking. These observations suggest that encouraging students to generate their visual content using AI tools may provide opportunities for deeper engagement with language material and support language development as well as improve methods of teaching English as a second language by making them more effective and responsive to learners' needs.

Recommendations

Future studies should further explore the impact of integrating instructional design related to visual content creation and a structured approach to using AI on the development of specific language skills. Greater emphasis should be placed on designing targeted tasks aimed at enhancing particular language competencies. Special attention can be paid to the refinement of the instructions of critical collaboration of students with AI-generated materials considering different proficiency levels of learners of English as a second language, especially of students with a low proficiency level.

Conclusion

In response to modern-day demands and challenges, foreign language educators try to find solutions that will help to productively develop linguistic skills through methods which can simultaneously train the skills highly required in future digitally and culturally diverse workplaces. Employing the intrinsic interest of tech-savvy learners in modern technology and their needs and preferences for multimodal content to which they are accustomed in their digital environment, the researchers devised a special instructional design related to the intensive use of visual learning materials authored by students. The algorithm for collaboration with AI and the work with specific features of AI-generated materials were applied aimed at making a student a critical consumer of this content and mitigating potential drawbacks of AI use, such as over-reliance on AI tools and reduced critical thinking. Rather than relying on AI passively, learners demonstrated an active process of evaluating, modifying, and personalizing the language material to produce original visuals. The outcomes of the research appear consistent with the stated hypothesis. The findings of the post-test and administered questionnaire suggest that integrating visual creation and AI-supported activities into English language teaching can improve language skills development, enhance motivation and interest as well as impact the digital literacy advancement of students. Thus, the suggested instructional design can be productively exploited to enhance linguistic proficiency, including professional vocabulary, reading, listening, writing and speaking skills. It contributed to greater learner engagement and encouraged thoughtful interaction with AI.

Despite its strengths, the study has some limitations. It was conducted with a relatively small sample size and a short intervention duration. In addition, the effectiveness of the presented approach may vary depending on the level of students' language proficiency, the complexity of the topic, and the teacher's willingness to provide personalized guidance throughout the students' learning process. Another limitation is the different levels of digital competence among students, which were not examined but could have affected how effectively the strategy was applied. Further research is also needed to determine the specific role of AI in creating visual content for language learning, as the AI-related findings in this research were based only on students' results and perceptions.

The findings may be used by curriculum designers and educators, interested in effectively integrating AI into the educational process. The study highlights strategies that could facilitate the language development of second language learners preparing for professional environments.

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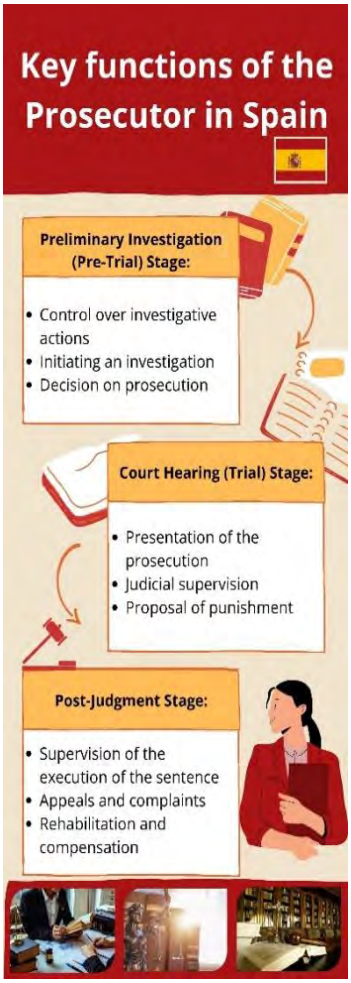
Appendices

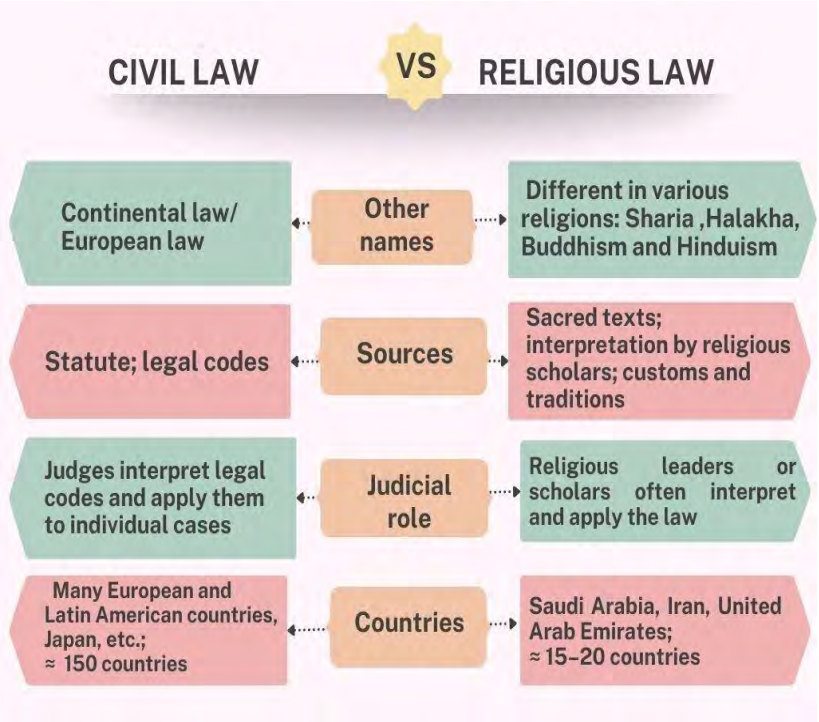
Appendix A

Student-Created Infographics on the Topic "Functions of Prosecutors in Different Countries"



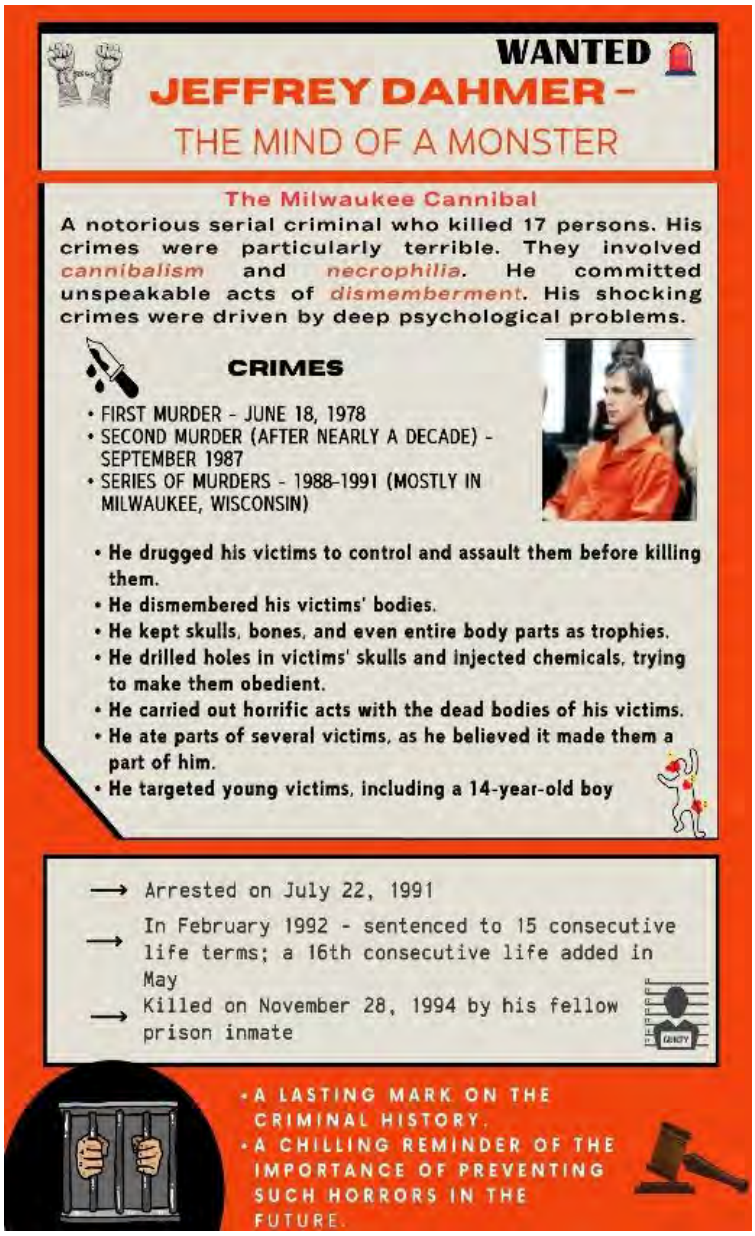
Appendix B

A Comparative Chart of Civil Law and Mixed Law Specific Features



Appendix C

A Student-Created Poster Presentation on the Topic "A Notorious Criminal"



Appendix D

Digital Passion Video Project Screenshots