Design, Application, and Evaluation of a digital artifact prototype for youth and adult education: a critical view of the use of ChatGPT in a task resolution[1]

Design, Aplicação e Avaliação de protótipo de artefato digital para educação de jovens e adultos: uma visão crítica do uso do ChatGPT na resolução de tarefas

Susana Cristina dos Reis[2]
Anderson José Machado Linck[3]
Matheus das Chagas Figueiredo[4]
Jonathan Oliveira Soares[5]
Adilson Fernandes Gomes[6]

Abstract
The National Common Curricular Base (Brasil, 2018) emphasizes the role of digital technologies in promoting learning and developing students' competencies for societal engagement. It advocates for the meaningful, ethical, and critical use of technology to foster communication, collaboration, access to information, and knowledge production. However, integrating these tools into educational practice remains a challenge, requiring teachers to seek new knowledge and adapt their pedagogical approaches (Koehler; Mishra, 2008; Koehler *et al*., 2014; Reis, 2021). This study reports on the implementation of the digital artifact "Aprendendo com a Tecnologia" ("Learning with Technology") in a Youth and Adult Education class at a public school in Minas Gerais, Brazil. The design addressed student interest in the ChatGPT platform and guided them through a multimethodological didactic sequence. A mixed-methods approach combined design-based research and a case study. The design followed the Reis (2021) framework to support the design of digital materials. The teaching proposal was grounded in multiliteracies pedagogy, the MoDE model (Reis, 2021), and Keller's (2010) ARCS motivational model. Results demonstrated that the digital artifact supported the development of social, technological, and discursive competencies, enhancing students' learning experiences through the exploration of multiple modes and multimodal resources, thus fostering new literacies.

Keywords: Digital Artifact Design. Google Sites. Pedagogy of Multiliteracies. MoDE. ChatGPT.

Resumo
A Base Nacional Comum Curricular (Brasil, 2018) enfatiza o papel das tecnologias digitais na promoção da aprendizagem e no desenvolvimento de competências dos estudantes para o engajamento social. Defende-se o uso significativo, ético e crítico dessas tecnologias para favorecer a comunicação, a colaboração, o acesso à informação e a produção de

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[2] Doutora em Letras, docente e pesquisadora no Programa de Pós-graduação em Letras e no Mestrado Profissional em Tecnologias Educacionais em Rede. Universidade Federal de Santa Maria, Santa Maria, RS, Brasil. Orcid: https://orcid.org/0000-0003-1697-2237. E-mail: susana.reis@ufsm.br.
[3] Doutorando do Programa de Pós-graduação em Letras. Universidade Federal de Santa Maria, Santa Maria, RS, Brasil. Orcid: https://orcid.org/0000-0002-5632-7366. E-mail: anderson.linck@acad.ufsm.br.
[4] Doutorando do Programa de Pós-graduação em Linguística Universidade Estadual do Rio de Janeiro, Rio de Janeiro, RJ, Brasil. Orcid: https://orcid.org/0000-0001-8790-8051. E-mail: matdcf@gmail.com.
[5] Mestre do Programa de Pós-graduação em Estudos Linguísticos. Universidade Federal de Minas Gerais, Belo Horizonte, MG, Brasil. Orcid: https://orcid.org/0000-0002-6234-4533. E-mail: jonathanprof2016@gmail.com.
[6] Doutorando do Programa de Pós-graduação em Letras. Universidade Federal de Santa Maria, Santa Maria, RS, Brasil. Orcid: https://orcid.org/0000-0001-8492-2413. E-mail: adilson.gomes@acad.ufsm.br.

conhecimento. No entanto, a integração desses recursos às práticas pedagógicas ainda representa um desafio, exigindo que os docentes busquem novos saberes e adaptem suas abordagens pedagógicas (Koehler; Mishra, 2008; Koehler *et al*., 2014; Reis, 2021). Este estudo relata o processo de design de um artefato *digital* Aprendendo com a Tecnologia, para uso em uma turma de Educação de Jovens e Adultos (EJA) de uma escola pública de Minas Gerais, Brasil. O design da proposta considerou o interesse dos estudantes pela plataforma *ChatGPT* e os conduziu por uma sequência didática que utiliza multimétodos. A pesquisa adotou uma abordagem de métodos mistos, combinando investigação baseada em design com estudo de caso. O desenvolvimento do artefato seguiu o Modelo Cíclico de Design de Artefatos Digitais (MoDE), proposto por Reis (2021). A proposta pedagógica foi fundamentada na pedagogia dos multiletramentos, no modelo MoDE e no modelo motivacional ARCS (Keller, 2010). Os resultados demonstraram que o artefato contribuiu para o desenvolvimento de competências sociais, tecnológicas e discursivas, ampliando a experiência de aprendizagem dos estudantes por meio da exploração de múltiplos modos e recursos multimodais, promovendo, assim, novos letramentos.

Palavras-chave: *Design* de Artefato Digital. *Google Sites*. Pedagogia dos Multiletramentos. MoDE. *ChatGPT*.

1 Introduction

We live in a digital era where access to information is ubiquitous. However, this abundance of dynamic information does not yet fully translate effectively in the school context. This occurs due to the lack of integration between digital technologies and pedagogical objectives in teaching practices, particularly regarding the knowledge needed to articulate technology and teaching effectively (Koehler; Mishra, 2008; Koehler *et al*., 2014).

Aiming to boost the technological advances in school dynamics and to promote transformative learning, as well as to stimulate the construction of new knowledge and the development of multiple literacies (Kalantzis; Cope; Pinheiro, 2020; Rojo, 2017), this article describes the design of the digital artifact *Aprendendo com Tecnologias* (translate as *Learning with Technologies)* and evaluates its application by potential users. *This digital material* was created and applied to a vocational Youth and Adult Education (YAE) class at the high school level in Juatuba, Minas Gerais (MG), Brazil.

It is worth noting that the first version of this digital material was developed as an evaluative activity for the graduate discipline *Design of learning and teaching online practices*, offered in partnership by the Federal Universities of Santa Maria and Minas Gerais during the second semester of 2023. This article describes the results obtained by applying this digital material in school contexts.

To design this digital material, *Learning with Technologies*, we considered the target audience to be young adult students, aged 25 and over, and their interest in using technologies in the classroom. In this context, students have access to personal smartphones and a computer room equipped with computers, tablets, and Wi-Fi available for use during class hours. Moreover, recent studies emphasize the need to teach people how to use Artificial Intelligence (AI) as a work tool. This study explores the ChatGPT platform.

As teachers of additional languages in basic and higher education contexts, we have observed the need to adopt practices that allow students to experience new knowledge diversely in language teaching, ensuring the effective use of technology meets the demands of the language in the current global context. This will enable students to get involved in various social practices, inserting themselves through language into the different spheres where these activities occur (Kalantzis; Cope; Pinheiro, 2020; Reis, 2021; Mishra; Koehler, 2006; Halliday; Matthiessen, 2014).

We understand that the critical and responsible use of technological resources such as ChatGPT and Google Sites, among others, offers environments that are conducive to the development of social, technological, and discursive competencies through the exploration of different semiosis to improve the learning process of the students, immersing them to use research tools offered by technologies in a coherent, responsible, and fruitful manner.

To broaden our discussion of the theme explored in this article, we examine key concepts to support this study and to teach language as a social practice (Halliday; Matthiessen, 2014).

2 Design of teaching and learning materials from a perspective of language as a social practice

This study is grounded in a sociocultural perspective, which views language as a social-semiotic system (Halliday; Matthiessen, 2014) and as a resource for constructing meaning. In this perspective, the use of language allows us to act semiotically, using it as a resource for constructing meanings and conciliating verbal and nonverbal texts that take place in different contexts (Heberle, 2005, p. 211), since there is a "bidirectional relationship between texts and society, i.e., discursive forms and social structures influence each other" (Meurer; Bonini; Motta-Roth, 2005).

Hence, the present study highlights that an alternative for students to become protagonists of their learning processes is to place them in an immersive collaborative learning process, by exploring authentic and situated practices. To achieve this, it is necessary to propose activities that enable students to experience, create, and design activities that interest them.

In this sense, the planned digital teaching material, proposed in this study, is also based on other studies, such as the pedagogy of multiliteracies (Kalantzis; Cope; Pinheiro, 2020; Rojo, 2017, among others), which guides the design, application, and evaluation of the learning experience provided to students (Reis, 2021).

By multiliteracies we understand it as a practice that proposes activities involving social and cultural diversity, as well as the exploration of different semiotic resources and tools that involve

multimodality at a contextual level (community environment, social role, interpersonal relations, identities, subject) and a modal level (written, visual, special, tactile, gestural, audio) (Kalantzis; Cope; Pinheiro, 2020).

The contextual aspect refers to the social diversity and variability of the texts within the community environment in which they are (re)produced, thus involving social roles, interpersonal relations, identities, and subjects, among other things. On the other hand, the modal aspect refers to multimodality and involves integrating texts from different scopes, such as audiovisuais, spatial, behavioral, and gestural, among others (Kalantzis; Cope; Pinheiro, 2020). These texts, for example, can be found in media, multimedia, and electronic hypermedia.

From this perspective, as suggested by Rojo (2017) and other authors (Kress, 2010; Santos; Gualberto, 2023; Kalantzis; Cope; Pinheiro, 2020; Reis, 2017), due to the multimodal composition of texts, multiliteracies is understood as a practice involving multisemiotic texts, whether printed or digital, that "includes reading and production procedures and capacities that go far beyond the comprehension and production of written texts", since "they incorporate the reading and (re)production of images and photos, diagrams, graphs and infographics, videos, audio, etc" (Rojo, 2017, p. 4).

Thus, practices that involve multimodality and take their context of use into account allow students to improve their comprehension and production abilities in a more meaningful manner for everyday life. Therefore, it is fundamental for educational institutions to incorporate the stimulus for the development of new literacies among their students into the pedagogical curriculum. To this end, guaranteeing the exploration of technological innovations and incorporating literacies into digital media to create meaning is a duty of the school community, given that the digital environment has become a distinct way to integrate interactions and students' experiences in social practices.

Given this, the following question is raised: How may educational processes be improved to meet the new requirements of the contemporary world? In this context, it becomes essential to promote the capacity-building of teachers who are learning designers to favor student participation and engagement (Linhati; Reis, 2023). To archive this, we need professionals who are capable of creating favorable conditions for these learners to assume the "responsibility for their learning autonomously; who feel comfortable with learning design" (Kalantzis; Cope; Pinheiro, 2020, our translation), proposed through the different media and the Internet, exploring the "spaces for instruction that are not limited to lesson plans, textbooks, of student manuals" (Kalantzis; Cope; Pinheiro, 2020).

2.1 Framework to guide the digital material design

To design de digital teaching material, in this study we adopted the framework *Modelo Cíclico de Design de Artefatos Digitais* (MoDE - Cyclical Model for Designing Digital Artifacts) proposed by Reis (2021), which conceives artifact design as a process divided into steps, taking into account both the context of application and the learning interests and needs of the students, within a perspective of language as a social practice and the pedagogy of multiliteracy. This choice is justified by the model´s comprehensiveness, which considers not only the development of the digital artifact but also its applicability and redesign (See Figure 1).

Based on these assumptions, it is important to emphasize that design is understood in this study as "a set of practices that vary, among other aspects, according to the pedagogical/andragogical approaches and the types of technology employed" (Filatro, 2008, p. 17, our translation). According to this author, this set of practices must be conceived and implemented in proposals for teaching materials in the teaching and learning processes in the school context.

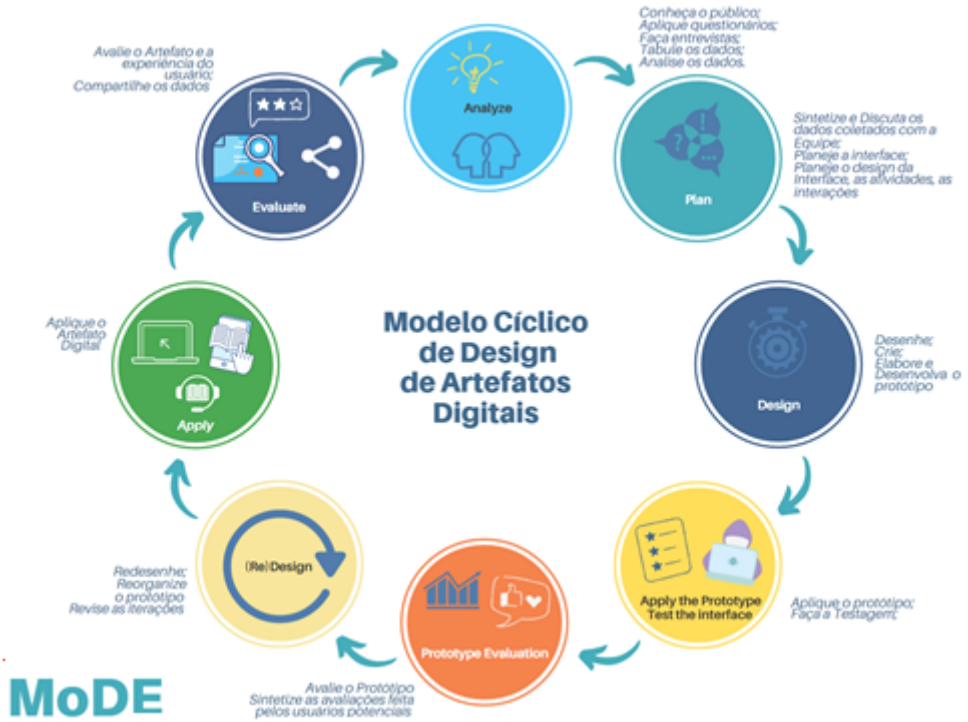

Figure 1. *Modelo Cíclico de Design de Artefatos Digitais* (MoDE)
Source: developed by Reis (2021).

According to the MoDE framework (Reis, 2021), the diagnostic analysis seeks to identify the target audience's interests and needs to plan and develop the digital artifact. To this end, a diagnostic questionnaire was applied, allowing students to express their interests and needs regarding the use of digital technologies for learning in everyday life.

In *Phase 2*, the team analyzed and synthesized the data collected. The results led to *Phase 3*, in which the syllabus design and prototype were developed. In this step, Reis (2021) suggested developing the artifact interface and the activities that will allow users to explore the proposed content interactively. In this study, the *Google Sites* platform was selected for this purpose as the virtual space in which the digital artifact Learning with Technologies was developed.

Furthermore, *Phase 4* was initiated by the prototype testing process. To this end, three classes were developed using the artifact as a digital learning material to support the activities. According to Reis (2021), it is also in this phase that teachers, as designers, notice the need to adjust the material they developed. In addition to *Phase 5*, the author suggested evaluating the prototype with potential users to gain insights into their experience of interacting with the artifact. This is an important step in identifying issues and establishing patterns to guide the redesign, a procedure described in *Phase 6*. This study only considers the guidelines recommended in Phases *1* to *5* of the MoDE framework (Reis, 2021).

To evaluate the prototype, we adopted the approach of the ARCS model by Keller (2010), who sought to investigate the motivation of an individual to learn based on criteria such as Attention, Relevance, Confidence, and Satisfaction (Keller, 2010).

The attention factor refers to capturing the learner's interest to generate engagement with the material, which can be achieved through interactive multimedia resources or thought-provoking questions. Relevance concerns the recognition of the connection and applicability of the content to the learner's real social context. Confidence relates to the learner's belief in their ability to perform a task successfully. To foster this, it is essential to provide clear instructions that use scaffolding strategies, which facilitate understanding and support the achievement of the proposed tasks. Lastly, satisfaction is associated with a positive emotional response and a sense of reward after accomplishing the learning objectives. This factor is crucial for promoting opportunities for reflection and self-assessment throughout the learning process.

Based on these principles, an evaluation questionnaire was developed and administered at the end of the third session to collect feedback from the target audience regarding their experience with the prototype.

3 Methodology

This study is situated within the field of Applied Linguistics and operates as an extension of prior research approved by the Ethics Committee for Research involving Human Subjects of the Federal University of Santa Maria (CAAE 72890123.2.0000.5346). Methodologically, the study employs a mixed-methods approach, which integrates Design-Based Research (DBR) principles with a qualitative case study. This framework is utilized for the implementation and evaluation of the Digital Artefact Learning with Technologies, designed to foster the development of multiliteracies.

To this end, we adopted the definition of design-based investigation proposed by Armstrong *et al.* (2022, p. 7), who stated that designers may conduct a design-based investigation focused on "(a) comprehending the contexts; (b) conceiving effective systems; (c) developing significant changes for the subjects of their studies" (our translation).

The target audience for this investigation consists of students aged 25 to 43 enrolled in Youth and Adult Education (EJA), a group characterized primarily by working during the day and having limited time for evening study. To gain a comprehensive understanding of this specific investigation context and the student's existing patterns of technological resource use in learning, a diagnostic questionnaire was applied. The findings from this initial data collection were instrumental in guiding the methodological design and development of our research proposal.

The analysis carried out from this synthesis of the results showed that 10 of the 12 students who participated in this study claimed to have the habit of accessing the Internet during the class period, with this access intended mainly for searches and interactions with the design of the class proposals using smartphones in the school's virtual learning environment. The familiarity with technology stemming from this use enabled the use of software, virtual environments, platforms, and websites to study and consolidate the execution of school tasks.

We also suggested a list of digital tools to identify those used by the teachers, with which the students had previously contacted. The one most pointed out by the students (70%) was *Google Sites*, which delimits the tool used to host the digital artifact proposed in this study, and assists in selecting the other tools to incorporate into the design.

Regarding the suggestion of using digital tools in the classes, we obtained a significant number of indications from ChatGPT. Hence, we opted to develop a teaching proposal that would

equip students with the knowledge necessary for the conscious and ethical use of this tool. As the last question, we asked about previous experiences with using technology in the classroom, and 75% responded that technology had been used to *improve/contribute to* the understanding of the studied content. In this sense, we considered designing a proposal for an artifact that would equally serve to enhance and contribute to the construction of knowledge.

To evaluate the use of this digital artifact, *Aprendendo com Tecnologias (Learning with Technologies)*, which was created and applied in the classroom, we considered the categories proposed by Keller (2010), and we collected the evaluation questionnaire's results to analyze the data. This online form was submitted to the students at the end of the teaching experience.

4 Describing the design of the Digital Artifact *Learning with Technologies*

The digital artifact Learning with Technologies was developed using the MoDE framework proposed by Reis (2021). This approach allowed us to plan the content and explore the interactions and dynamics involved in creating and using the artifacts.

This website comprises eight pages: i) *Home*; ii) *Aula 1 – Os Potenciais da Tecnologia* (Class 1 – The Potentials of Technology); iii) *O Gênero Debate* (The Debate Genre); iv) *Aula 2 – I.A.: Inteligência Artificial* (Class 2 – A.I.: Artificial Intelligence); v) *ChatGPT*; vi) *Aula 3 – Seminários* (Class 3 – Seminars); vii) *O Gênero Infográfico* (The Infographic Genre); viii) *Referências* (References). Except for page viii (*References*), all pages feature an illustrative banner at the top that mentions the overall idea of the content addressed on that page. Credits to the website authors and the year of creation are on the footer.

To navigate the website, use the left-side navigation bar (Figure 2). It includes elements that allow fast navigation between specific pages. Clicking the logo takes the user to the main homepage. The white block indicates the current page and is positioned in the upper-left corner of the screen, next to the page title. The graphic element *expansion arrow* reveals the website's subpages and changes its position from *down (*indicating hidden pages) to *up* (indicating the potential to hide subpages). Lastly, the page titles work as hyperlinks that take the user to the page when clicked.

In addition, the main homepage aims to present the proposal for the classes to students and to serve as a door to the website, a practical entry point at the beginning of each class. Through the teacher-designed QR Code on the screen, the students are directed to the website homepage, on which they may navigate with their devices individually and have access to the available hyperlinks.

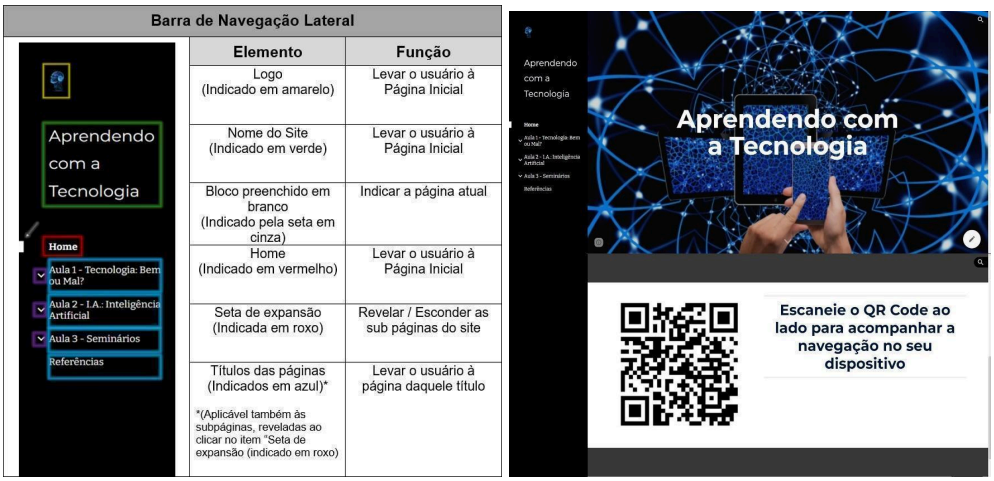

Figure 2. Side navigation bar & Home Page.
Source: developed by the authors. Available at: https://sites.google.com/view/educacaoeia/home

The digital materials available on the website comprise materials for three classes: Class *1* - participants explore the potential of using technologies, and the Genre Debate (Figure 3), which was used in class to introduce students to the structure and discursive elements of the Debate Genre. It includes a *YouTube* video and a *Google* Docs script to guide analysis. The activity focused on analytical learning through inferential and deductive reasoning, encouraging students to identify rhetorical patterns, logical connections, and the structure and function of the genre.

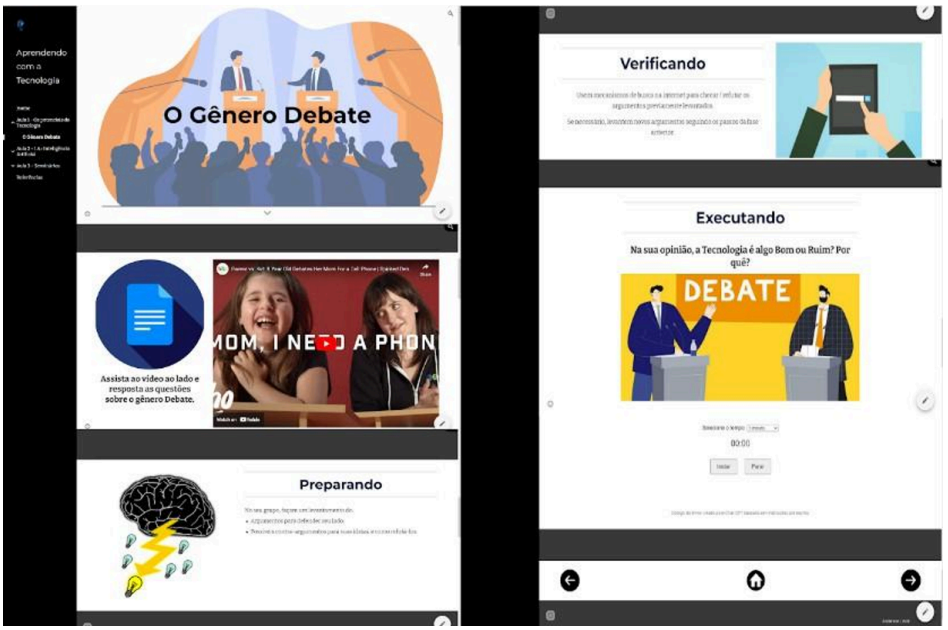

Figure 3. *O Gênero Debate*
Source: developed by the authors.

In Class 2, we explore the theme *A.I.: Artificial Intelligence* and gender infographics. The material provides a clustering tool available on a webpage called *Random Lists, which was used to* promote learning practices on how to explore ChatGPT. In it, the teacher may add the names of all students in the classroom and group them randomly to work together on the following activity. In this context, we used two groups (Figure 4).

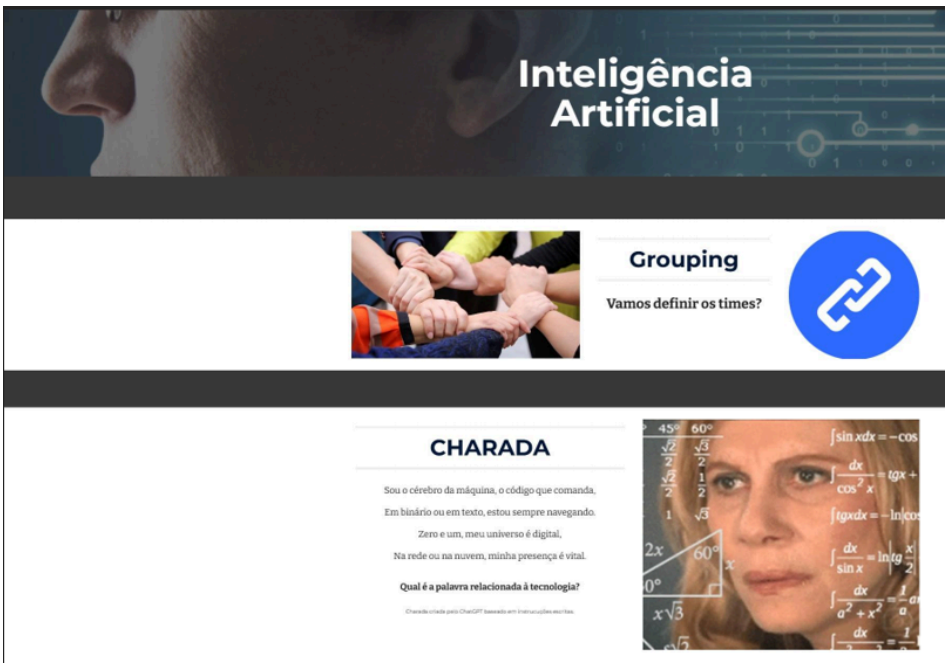

Figure 4. *The Aula 2 - I.A.: Inteligência Artificial Page*
Source: developed by the authors.

Finally, Class 3, named Seminars Page, contains instructions for the final activity, so the students may access them remotely if necessary. Moreover, it presents the evaluation criteria in a *Google Docs* file (Figure 5).

Figure 5. *The Aula 3 - O gênero infográfico Page*
Source: developed by the authors.

For this resource, we opted to add the Google Docs file directly to the website through embedded navigation, allowing one to view its content without having to visit the file page. However, it is possible to open the file on a new tab by clicking the icon in the upper-right corner when placing the mouse over the embedded navigation. This choice is intended to explore the recognition of the different semiotic representations of the same tool, allowing the observation of hyperlinks and embedded navigation.

4.1 Diversity of Multimodal Genres in the Digital Artifact

In this digital artifact, we can find a variety of digital and multimodal genres being explored. One activity, for example, is a hangman game. To provide context and activate schemata, the teacher leads a competition in which students choose letters to discover the sentence: Technology - Good or Evil?. To create this activity, we use a prompt in ChatGPT to require an HTML code for this activity, following the necessary parameters. After several trial-and-error sessions, the game code was ready.

Furthermore, we include a QR Code on the page, and it leads to a Diagnostic Questionnaire. The purpose of this form is to map students' needs and interests. After data collection, a brief discussion on the sentence previously discovered in the game was proposed. This moment seeks to bring to the learning situation experiences familiar to the students and related to the use of digital technologies, considering their previous knowledge and instigating them to explore new knowledge

(Kalantzis; Cope; Pinheiro, 2020). Through analyzing the dynamics of the opposing ideas in the sentence, we sought to introduce the Debate Genre.

The Debate Genre was used in class to introduce the students to the discursive dynamic that they would be subjected to. To this end, the page has a YouTube video demonstrating the genre in use, accompanied by a Google Docs script to guide the textual analysis and recognition of the discursive moves employed in the genre. In this activity, we initially opted to start with the process of analytical learning of the literacies, seeking to experience the genre from inferential and deductive reasoning processes, stimulating the students to identify rhetorical patterns and movements of the Debate Genre. In other words, the students analyze logical connections, cause-and-effect relationships, structure, and function of the text (Kalantzis; Cope; Pinheiro, 2020).

Hence, we organized the page by accommodating the three moments of the Debate: preparing, verifying, and executing. In them, the students were encouraged to raise arguments collaboratively, being reminded to base their argument on scientific facts, verify the veracity using reliable Internet sources, and simulate a Debate in class. For this last moment, one minute was established for argumentation and one minute for counter-argumentation. To control the time, ChatGPT was also instructed to create an HTML code for the timer added to the website.

To explore the theme "A.I.: Artificial Intelligence", the material challenges the students to decipher a riddle on the page, which was also generated by ChatGPT prompts. The answer to the riddle (processor) would serve as the password for the compressed file that each group downloaded by accessing or clicking on the corresponding QR Code. In this step, the students experienced teamwork, mobilizing technological knowledge from their repertoire to solve a problem actively and collaboratively. Each group included an image within its file with a fast definition of Chatbots (Group 1) and Search Engines (Group 2).

The ChatGPT Page contains digital resources and textual sections with procedures to be used in class. On this page, we initially used the *Kahoot*[4] artifact to create quiz-type games with questions and answers. To play the game, students connected through the PIN generated when they matched. For this study, we aimed to create a game that presented data on Artificial Intelligence, regardless of whether the class had prior knowledge. Through competition, we promoted initial learning dynamically, activated students' prior knowledge, and instructed the use of new knowledge.

Further down, the page also presented a *YouTube* video that briefly introduced ChatGPT and its capabilities. The video is narrated in English. In addition to the content, it was used as a tool to

present to the students the possibility of i) activating hidden captions and ii) translating captions, thus expanding their digital literacy in navigating the YouTube platform.

Lastly, to allow the students to have contact with the main technology, the use of ChatGPT or another Chatbot of their choice was proposed for gathering data. During the guided research, students should use the tools to gather information on the potential of other AIs to address the situations selected by the students in the previous activity. In this step, the students constructed meanings about the theme, connecting the conceptualization through naming with the new step, in which they experienced novelty autonomously (Kalantzis; Cope; Pinheiro, 2020).

Access to ChatGPT was facilitated through hyperlinks present in the images of the subsections, with the purpose of guiding the students to research Artificial Intelligence for use in learning and using artificial intelligence in learning practices, through which the students were redirected to the page of the technology.

Besides, in the digital material, we explored other multimodal genres such as infographics, and it provided support material for reference, if necessary. As a resource, a slideshow was created containing images that serve as examples and models of infographics, including an infographic that presents tips for creating one. As a limitation of the Google Sites platform, some images were expanded, hindering content playback.

The second tool available is a Google Docs file containing hyperlinks that direct the student to different pages with various tips on how to create an infographic, in addition to tools to render the development more practical. Once more, we chose embedded navigation, and the content is visible on the website page without opening the document in another tab.

At this time, the students were challenged to produce an infographic collaboratively and creatively, synthesizing ideas collected by using the different tools, challenging themselves to innovate, and, at the same time, conveying the intended message. To this end, it was necessary to understand the need to move from one context to another, thus allowing the student to take authorship (Kalantzis; Cope; Pinheiro, 2020). After the students designed the infographics, they were published on the *Padlet* platform for classmates to share.

5 Discussion and analysis of the digital artifact used in class

To evaluate the efficacy of the digital teaching material design prototype proposed to the students, Reis (2021) deemed that an essential step for the MoDE framework is the application of the

evaluative questionnaire at the end of the last meeting. This is the proper instrument for collecting the participants' feedback to inform the artifact redesign process. Hence, we sought to align the evaluation step with the ARCS model by Keller (2010), considering the student's experience regarding the frequency of access, the reasons for access, the teaching material of the website, the website navigation, and the reflection about the content learned and its applicability.

Attention is related to the students' interest throughout the teaching and learning process. It is worth noting that students selected the technology studied via the diagnostic questionnaire was already a reason to draw attention. However, we sought to evaluate the navigability index, and we found that 100% of the respondents stressed that the website navigation was simple and objective, with 87% completely agreeing. However, some students felt lost while navigating through the website resources, which suggests the need to redesign the artifact to render it more dynamically and intuitively.

In terms of access frequency, data showed that 75% of the students used the website resources during the class period and 87.5% outside the class period. Among those who used it outside the class period, 7.1% reported doing so at least one to five times per week. The data show the usability of the resource (on computer, tablet, or smartphone interfaces) and the ability to use the artifact in or out of the class period as many times as needed, which may also indicate the recognition by the students of the potential of the artifact for their learning process.

Relevance is associated with producing educational resources and content that is significant to the students. To this end, it is essential to ensure that the curiosity of learners is stimulated, as well as their motivation and engagement. In this sense, we concluded that there was motivation and engagement, as the participants indicated the desire to carry out and experience the resources in new contexts. This is proven by the assessment questionnaire data. Among the five possible situations, we found in the first place *para explorar os recursos disponíveis* (to explore the available resources) with 100%, followed by *para rever o conteúdo* (to review the content) and *para consultar as instruções das atividades* (to consult the instructions for the activities), with 87.5% each.

The data analysis sought to determine the students' perception regarding the resources available on the website, seeking to understand the degree of difficulty in using them, the previous familiarity with the available tools, and the overall perception of the design and applicability of the content in extra-class contexts. As a result, we found that 80% of the participants understood the website as organized and motivating, contributing to their learning. Moreover, several new resources were introduced to the repertoire during the use of the website. However, 25% of participants reported

having previously contacted some website resources. In general, we concluded that the objective of this proposal, which sought to allow students to discover and experiment with new digital tools to develop digital literacy competencies, was achieved.

In the confidence evaluation, positive expectations were observed regarding the participants' learning process. Thus, regarding learning about ChatGPT, all students showed a positive attitude and saw usefulness in several social areas, such as work, studies, entertainment, and school practice. Some recognized the potential to help learning through research, even contrasting it with search engines and analyzing the advantages over them. This reflection attests to another intention of this study: developing a critical sense of the potential of using digital technologies for learning.

Regarding the necessary abilities for other students, the respondents understood that familiarity with the Research genre is enough to use the tool. This, in turn, depends on additional skills, such as reading and navigating the Internet, and the critical view of the need to verify the information found. The interpretation of the data once again demonstrated the achievement of another objective intended by the study: to raise students' awareness of the responsible use of digital tools for learning.

To evaluate satisfaction, we focused on the evolution and progress, motivated by the commitment and effort shown by the participants in the face of their learning. To better understand the satisfaction's perception, we proposed three open-ended questions in which the participants were invited to share their impressions about using ChatGPT, what they learned about it after the classes, and, lastly, reflect on what they need to know to use it critically and ethically in the everyday context.

Finally, the participants showed a change of attitude toward ChatGPT. Before the tool was presented, the participants reported a mixture of negative opinions, such as fear, and neutral attitudes due to their lack of knowledge. After participating in the study, all respondents reported positive attitudes, showing their perception of the great potential of the tool, besides surprise and wonder.

As observed earlier, the artifact Learning with Technology proved to be of great utility for the students, who were able to engagedly the experience of using several digital tools, most of which were new to them, in addition to developing a critical sense about the effective and responsible use of tools such as ChatGPT to help them learn. This knowledge proved to be transformative for the students due to its practical nature, aligned with the practices found in several moments of their lives and social and cultural contexts.

6 Conclusion

This study aimed to describe the design of the digital artifact *Aprendendo com a Tecnologia* (Learning with Technology) in a high-school level vocational Youth and Adult Education class of the SESI/FIEMG School, which uses the space of a municipal school of the city hall of Juatuba, MG, to teach its lessons. Its development proved to be effective in promoting student learning by creating a multimethodological teaching sequence that covered different modalities and multimodal resources.

Using digital tools, such as ChatGPT and Google Sites, allowed the students to explore different content formats, including written texts, videos, and images, promoting more diversified and meaningful learning. Moreover, the interaction with these tools fosters social skills such as collaboration and teamwork, given that the students were encouraged to work in groups, share their creations, and exchange experiences.

We found that the prototype design and implementation of this digital artifact, combined with the multiliteracies perspective and the MoDE framework, were fundamental to achieving the objectives proposed in this study. The use of diverse technological resources and the interaction between the participants through these tools allowed for more dynamic, meaningful, and socially constructed learning.

The participants proved receptive to the learning proposal, demonstrating a considerable rise in motivation and interest in the content. Their creations were also quite satisfactory, showing the development of research, selection, and communication abilities, and the capacity to work in groups and collaborate effectively. It is also important to consider students' specific contexts when planning and implementing learning proposals using technology.

In this sense, having access to personal smartphones and a well-equipped computer room was fundamental to the digital artifact's application success. This reinforces the importance of promoting digital inclusion and guaranteeing the availability of technological resources in schools, especially for vocational high-school-level Youth and Adult Education classes.

Therefore, this study contributed to reflecting on and broadening the possibilities for using digital technologies in the educational context, seeking to promote education that is more meaningful and aligned with the demands of the 21st century. The developed digital artifact prototype proved to be an efficient and innovative tool for promoting learning, encouraging students to use technology critically and responsibly. The results of this experience showed that, in practical activities, it was necessary to

stimulate the critical sense and teamwork for the students to co-construct knowledge about the potential and limitations of digital technologies as individual learning facilitators.

Lastly, we emphasize the need to redesign the developed prototype based on the feedback obtained in the evaluative questionnaire and reapply it in the context of the investigation. Moreover, new research and studies on the design of digital educational material are necessary to improve the use of digital technological tools as pedagogical tools and expand the knowledge of their effectiveness in the educational process. The integration of technologies into the design of teaching and learning proposals is a promising path to improving education as a whole and developing competencies that are essential to student training.

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