

Article

Student Interaction with ChatGPT During a Source-Interpretation Task in Initial Teacher Education: Implications for Critical Thinking

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Abstract

Social Sciences education requires pedagogical approaches that foster critical thinking and enable students to analyze, contrast, and interpret complex social realities. As Generative Artificial Intelligence (GenAI) becomes integrated into higher education, it offers opportunities to support these processes while raising questions about students' autonomy and reliance on generated content. Although previous research has examined the educational uses of GenAI, less is known about how students interact with these systems when revising source-based interpretations and how they position themselves. This study examines how 83 first-year university students enrolled in Education degree programs interacted with ChatGPT during a source-interpretation activity and how this interaction was reflected in the reformulation of their initial responses. A qualitative descriptive–interpretative design compared initial responses, prompts, revised responses, and retrospective reflections. The findings show that interaction with ChatGPT rarely coincided with substantial changes in students' underlying interpretations or positions. Instead, it mainly supported response expansion, argumentative reinforcement, and in some cases reformulation. A central contribution of the study is the identification of four recurrent learner profiles within the analytical category of interaction orientations: autonomy-preserving, objectivity-seeking, stance-attributing, and validation-seeking. Greater textual elaboration did not necessarily reflect stronger critical thinking or more independent interpretation. These findings highlight the need for pedagogical strategies based on source comparison, verification, and justification of generated content.

Keywords: critical thinking; Generative Artificial Intelligence; ChatGPT; higher education; critical literacy



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1. Introduction

UNESCO (2023, p. 23) reminds us that “over time, relying on GenAI tools or content in education may have profound effects on the development of human capacities such as critical thinking skills and creativity.” This warning resonates strongly with current educational priorities, where the development of critical citizenship is framed as a central curricular objective (Ley Orgánica 3/2020 2020). From a critical pedagogical perspective, knowledge is understood as the foundation of emancipation, and the contents of social sciences are conceived as relevant or controversial social issues that require interpretation, debate, and informed positioning (Santisteban 2019). In this context, the growing presence

of Generative Artificial Intelligence (GenAI) in higher education raises important questions about how students engage with knowledge, how they construct meaning, and how their initial interpretations and critical stances may be shaped, or reshaped, through interaction with these tools.

The aim of this study was to investigate how first-year Education students interacted with ChatGPT during a classroom source-interpretation activity. It addressed two research questions: (1) What was the nature of students' interactions with ChatGPT during the activity? and (2) how were these interactions reflected in students' reasoning, argumentation, and reformulation of their initial responses? Existing research has expanded rapidly, but fewer studies have traced the interaction sequence from an initial interpretation through prompt construction to a revised response within a single task.

Recent literature has highlighted the educational potential of GenAI tools, such as ChatGPT, to support and enhance teaching and learning processes. In this regard, [Sullivan et al. \(2023\)](#) argue that the integration of these technologies into educational contexts may contribute to improved learning outcomes through personalized learner support, the provision of immediate feedback, and the promotion of greater student engagement in the learning process. This educational potential is particularly relevant in relation to critical thinking, a central competence in higher education and one of the essential skills of the twenty-first century. By facilitating the rigorous analysis of information, fostering abstract reasoning, and promoting a deeper understanding of social and educational phenomena, critical thinking is conceived as a conscious and self-regulated cognitive activity that involves interpreting, analyzing, inferring, and reflecting on information to make well-founded judgments ([Salido et al. 2025](#)). The relevant question, therefore, is not simply whether GenAI improves the quality of a response, but whether students continue to evaluate information, justify their decisions, and retain responsibility for the resulting argument.

The ability to analyze and evaluate information objectively and rationally, reach well-founded conclusions, and exercise critical thinking represents a significant challenge in higher education ([Area-Moreira and González-González 2026](#)). Recent studies have also examined how the use of GenAI may influence the development of students' critical thinking and autonomy ([Area-Moreira 2025](#); [Mogas and Morales 2025](#)). Within this emerging educational context, GenAI can be approached as an opportunity to strengthen students' competencies, promote source verification ([Gil-Duran and Sáez-Rosenkranz 2025](#)), and support the construction of multiperspective narratives for interpreting contemporary realities. To address these challenges, specific theoretical approaches and didactic models have recently emerged. Among them, the model proposed by [Area-Moreira and González-González \(2026\)](#) provides a pedagogical framework for the integration of GenAI into teaching and learning processes, emphasizing its role as a cognitive support tool and promoting the development of students' critical thinking through the critical analysis, evaluation, and validation of AI-generated content. At the same time, digital literacy frameworks for teachers and instructional resources for students have been developed to promote the responsible use of artificial intelligence, preserve academic integrity, and harness its educational potential ([González-Alcaide 2024](#)). Along similar lines, [Walter \(2024\)](#) argues that creating effective prompts constitutes an exercise in articulating critical thinking. Furthermore, as [Alubthane \(2026\)](#) suggests, AI-based tools can contribute to a more interactive and personalized conversational learning experience. Taken together, these considerations highlight the need to design activities and develop pedagogical models that transform GenAI into a catalyst for critical thinking and metacognitive reflection on the production of digital discourse ([Morote and Colomer 2024](#)).

Critical thinking is regarded as a key competence for understanding and interpreting the complexity of contemporary societies ([Ten Dam and Volman 2004](#)). In this context,

various educational approaches maintain that knowledge is a fundamental resource for identifying, analyzing, and questioning the power relations embedded in social reality. Accordingly, social science content can be approached through relevant social problems or socially controversial issues, which encourage reflection, argumentation, and the adoption of a critical stance toward contemporary challenges (Santisteban 2019). The abundance and accessibility of information make guided source analysis particularly important in Social Sciences education. This approach enables students to mobilize knowledge, critically evaluate information, and construct well-founded interpretations while fostering critical thinking. GenAI does not exempt students from critically examining the information they receive (Gallent-Torres et al. 2023). On the contrary, students must prioritize verifying the authenticity of the data and information used in their learning and teaching processes. Within this context, reading and analyzing primary sources is recognized as a valuable pedagogical practice for promoting critical and reflective engagement. This practice also contributes to developing competencies for participatory, responsible, and socially engaged citizenship. Consequently, sources (including press articles, scientific papers, websites, recordings, and books) must be carefully selected and critically analyzed to assess the reliability and quality of the information they provide, thereby fulfilling a verification function (Núñez et al. 2026).

Initial teacher education enables future teachers to confidently develop their classes (Ortega-Ruipérez 2018), as well as to acquire and replicate methodological techniques that, in turn, help consolidate teaching and learning processes. Text reading, debates in two groups and their respective positions, the viewing of materials, comparative analyses, the presentation of contradictory data, and open final discussions, among others, are some of the activities that foster the development of critical thinking (Ortega-Ruipérez 2020). In this new educational context, students also face an important challenge: they must be capable of generating their own texts, even when using GenAI, without becoming dependent on it. Such dependency could, in some cases, weaken their capacity for critical thinking and, in others, make it more difficult to detect false or inaccurate information (Gallent-Torres et al. 2023). The same authors caution that the uncritical use of GenAI may foster cognitive dependence, leading students to delegate analytical and evaluative tasks to the tool and thereby weakening their critical thinking skills (Gallent-Torres et al. 2023). This dependence is associated with an erosion of critical verification practices, as students may accept plausible yet inaccurate information without corroborating it, thereby increasing their vulnerability to errors and algorithmic biases (Wolfe and Mitra 2024). Taken together, these risks suggest that GenAI can strengthen critical thinking only when it is embedded in guided practices that require students to evaluate, compare, and validate GenAI-generated information. Some studies have shown that the use of artificial intelligence tools in literature-based activities may foster the development of critical thinking to a greater extent than traditional teaching methodologies (Liu and Wang 2024).

From the perspective of Social Sciences education, GenAI should be understood as an epistemic and political learning technology, functioning as a mediation that articulates the development of critical thinking and the construction of social learning (Núñez et al. 2026). The integration of artificial intelligence in higher education generates significant benefits when it is part of a carefully planned pedagogical design and is guided by teachers with technopedagogical competencies. In this context, GenAI acts as a resource that complements critical learning without replacing human reasoning or limiting students' creativity and autonomy. At the same time, universities must develop clear policies, teacher training programs, and ethical frameworks that ensure the strategic and responsible use of these technologies, while promoting critical thinking and its application across diverse academic and professional contexts (Aquiye Ramirez et al. 2025).

When addressing GenAI-based tasks aimed at developing students' critical thinking, [Area-Moreira and González-González \(2026\)](#) propose activities that compare article content with GenAI-generated outputs and require students to assess information quality, analyze arguments, and identify possible inconsistencies. At the same time, [Suriano et al. \(2025\)](#) show that interaction with generative GenAI tools can be a valuable resource for developing students' critical thinking skills, provided that an educational and participatory approach is adopted to promote the critical analysis of received information. This resource is therefore fundamental for the development of critical thinking skills; in other words, it enables students to analyze and evaluate information autonomously. Even so, this claim is not universally established, making it advisable to systematize the process and follow the KEP model ([Codina 2024](#)), which should aim to know, evaluate, and preserve. That is, it is essential to understand how GenAI systems work and their implications for privacy and data protection, critically evaluate the content they generate, and use them responsibly by ensuring the accuracy, verification, and proper attribution of information sources. Following the KEP model, a critical examination should be undertaken, applying responsibility and preserving accuracy. To this, the contribution of coordination among university teaching staff and collaborative work within an interdisciplinary proposal should be added ([Arroyo et al. 2020](#)), integrating content and globalizing knowledge.

On the other hand, critical thinking in relation to ChatGPT involves assuming responsibility for verifying information ([Santisteban 2025](#)) and cross-checking the information obtained through reliable external sources, comparing the data and arguments generated by GenAI with prior knowledge and with alternative perspectives or theories on the same topic ([Bond et al. 2024](#)). Such prior knowledge may derive from classroom learning experiences or from the user's own experience. This attitude of continuous questioning and verification is essential for developing an informed trust in generative AI, since generative models may produce information that appears plausible but is factually incorrect, thereby requiring systematic fact-checking and source-validation processes ([Wolfe and Mitra 2024](#)). In this regard, [Rahman et al. \(2026\)](#) further emphasize the importance of using validated evidence and fact-checking mechanisms to ensure the factual reliability and consistency of AI-generated responses. Explanations regarding stance attribution significantly influence the mental models that users develop about AI and their reactions to system failures ([Lv et al. 2024b](#)). Likewise, attributing intentionality to GenAI systems may influence how students interpret system responses and the degree of trust they place in them ([Lv et al. 2024a](#)). In this regard, unguided instrumental use can lead to an atrophy of comprehension skills ([Mohamed 2025](#)), and, therefore, of critical development, reinforcing the need for pedagogical guidance that fosters interpretation, cross-referencing, and verification.

Consequently, the critical use of ChatGPT implies that the user assumes responsibility for verifying the information received, contrasting it with reliable external sources and comparing it with previous knowledge, whether acquired in class or through personal experience; therefore, personal background knowledge is essential. This involves carrying out continuous and effective verification so that GenAI functions as a support in the learning process rather than a substitute for one's own judgment, even enhancing critical thinking through evaluation and synthesis. When used reflectively, GenAI may contribute to the development of critical thinking through processes of evaluation, comparison, and synthesis of information ([Codina 2024](#); [Liu and Wang 2024](#); [Ruiz-Rojas et al. 2024](#)) as well as from approaches that highlight GenAI's capacity to facilitate access to multiple perspectives and strengthen students' ability to compare and contrast information ([Alubthane 2026](#); [Melisa et al. 2025](#); [Nasr et al. 2025](#)). Taken together, these contributions indicate that GenAI can support information analysis and the development of more robust arguments when it is integrated into guided educational practices oriented toward reflection.

The educational community faces the challenge of integrating GenAI appropriately into teaching and learning. Its use in academic contexts should be guided by two fundamental principles: digital responsibility and the development of critical thinking (Bravo-Duarte et al. 2026). The former involves avoiding plagiarism and using the technology responsibly, whereas the latter requires analyzing, evaluating, and questioning information reflectively to form reasoned judgements and make informed decisions (Dwyer et al. 2014).

2. Materials and Methods

This study adopted a qualitative descriptive–interpretative design centered on a classroom-based intervention conducted during regular teaching hours. The study examined how first-year university students interacted with Generative Artificial Intelligence (GenAI) during the interpretation of a documentary source, focusing on the comparison of their argumentative responses before and after interacting with ChatGPT, as well as the prompts they generated during the activity. The following sections describe the participants and educational context, the didactic intervention, the data collection instrument, and the qualitative data analysis procedures.

2.1. Participants and Educational Context

The intervention was conducted on 30 September 2025, during the first weeks of the academic year 2025/26. The sample consisted of 83 first-year university students enrolled in the course Society, Family and Education within the bachelor's degree programs in Early Childhood Education, Primary Education, and the dual degree in Early Childhood and Primary Education, at the Terres de l'Ebre Campus of Universitat Rovira i Virgili (URV), Catalonia. The sample comprised 55 women (66.3%) and 28 men (33.7%), most of whom had been born between 2005 and 2007. Regarding their educational background, 63.9% of the participants had entered university through the Baccalaureate (upper secondary education) pathway, whereas 34.9% had entered through vocational education and training. One participant had already completed a university degree and was enrolled in her second bachelor's degree. Regarding their linguistic background, Catalan was the first language of 73.5% of the participants, Spanish of 25.3%, and other languages of 1.2%.

Although all participants but one reported previous use of ChatGPT, several required clarifications of the concept of prompt construction before beginning the activity. Therefore, students were given a brief explanation of the concept of prompts to ensure that all understood the task requirements, but no guidance was provided regarding prompt design or strategies for interacting with ChatGPT. The subsequent instructional component addressing prompt construction and the educational use of GenAI was delivered only after completion of the questionnaire to avoid influencing the data collected. Throughout the activity, students worked individually, and the lecturer only resolved technical questions related to the procedure without providing support for interpreting the documentary source or formulating prompts.

2.2. Intervention Procedure

The classroom-based intervention was designed to examine how students interacted with Generative Artificial Intelligence (GenAI) while interpreting a documentary source and responding to a sequence of open-ended questions. The procedure focused on comparing students' initial responses, the prompts they generated to interact with ChatGPT, and their subsequent revised or maintained responses. In addition to its educational purpose, the intervention provided qualitative data on students' interpretation of the text, argumentative reformulation (i.e., how they justified any changes), and patterns of interaction with GenAI.

As a documentary source, the article *El vaciamiento como política educativa* (Carrete 2025) was selected following the criteria proposed by Prats and Santacana (2011) for the educational use of documentary sources. The approximately 1800-word press article addressed educational policy and its social consequences in public primary schools in Buenos Aires, presenting different perspectives on school closures, budget reductions, and institutional decision-making. The source was selected from a distant sociopolitical context and was expected to be unfamiliar to most participants, thereby limiting the likely influence of specific prior knowledge.

The intervention was conducted during a regular two-hour class session. The first 60 min were devoted to data collection, whereas the second half consisted of a separate instructional discussion on prompt construction, the educational use of GenAI, and critical thinking; this instructional component of the second part was not included in the present study. During the data collection phase, students worked individually. The activity was designed around the documentary source and ChatGPT, which constituted the two resources provided for completing the questionnaire. All students were required to use ChatGPT, as it was the GenAI tool most familiar to them. They accessed ChatGPT through their own personal accounts; consequently, the model version and available functionalities could not be standardized across participants. After an explanation of the procedure, students read the article and responded to the instrument designed for this study.

2.3. Data Collection

Data were collected through an ad hoc digital questionnaire administered during the intervention. It was developed by the researchers specifically for this intervention and administered in Catalan. Although the instrument adopted a questionnaire format to structure and systematize the data collection process, the study followed a qualitative approach focused on analyzing students' written responses and their interaction with GenAI. Questionnaires can be used in qualitative research when they are designed to explore participants' perceptions, experiences, and meanings through open-ended responses (Creswell 2009).

The questionnaire consisted of three sections. In the first section, sociodemographic and contextual information was collected, including gender, year of birth, first language, previous studies, current degree program, and previous use of artificial intelligence tools. This information allowed the characterization of the sample and provided contextual elements.

The central part of the questionnaire comprised five open-ended interpretative questions, each following the same response structure. For each question, students first produced an individual response based exclusively on their own reading and interpretation of the documentary source. They then formulated and recorded a single prompt addressed to ChatGPT before revising, reformulating, or maintaining their initial response in a separate response field. Consequently, each question generated three complementary sources of qualitative data: the students' initial response, the prompt addressed to ChatGPT, and the revised response produced after the interaction. This structure enabled the systematic comparison of students' responses before and after interacting with ChatGPT, while also analyzing the prompts they generated as part of the interaction process.

The questions in this central section addressed successive stages of the process of interpretation. The first invited students to describe how the documentary source presented the educational changes, identify the actors involved, explain the reasons attributed to these changes, and analyze their consequences. The second required students to identify the perspective adopted in the article by distinguishing between the official position and the critical perspective presented in the text. The third asked students to state their own

position regarding these perspectives. The fourth required them to defend and justify their stated position. Finally, the fifth explored students' understanding of the broader social impact of educational measures by identifying the different social groups affected beyond pupils alone.

The questionnaire concluded with five brief open-ended reflective questions concerning the relationship between politics and education, political disengagement, students' perceived tendency to question information, and their retrospective evaluation of the prompts generated during the activity. The final two questions specifically elicited metacognitive reflection on prompt construction.

Informed consent was obtained directly through the questionnaire prior to participation. Although names and email addresses were collected for administrative purposes, all responses were anonymized in accordance with the information provided in the informed consent form.

2.4. Data Analysis

Data analysis was conducted using ATLAS.ti Web (version 26), within a qualitative descriptive–interpretative approach. Each participant's complete case constituted the primary unit of analysis and comprised five embedded interaction sequences (each consisting of an initial response, a prompt, and a revised or maintained response) together with the final reflective answers. The aggregation procedure varied according to the analytical dimension. Prompt type, response complexity, response reformulation, reliance on GenAI, and internal coherence were coded once per participant after comparing the relevant evidence across the complete case. Response complexity was assessed primarily from the five revised responses, while the initial responses and prompts provided contextual evidence. Response reformulation and reliance on GenAI were established through holistic comparison of the five interaction sequences. By contrast, changes in textual interpretation and personal positioning were established through direct comparison of the corresponding initial and revised responses, with the intervening prompt used to contextualize the interaction. Metacognitive reflection was coded from the final two reflective items.

The coding was done by one of the researchers who implemented the classroom intervention. Analysis began with an exploratory reading of the complete corpus. A provisional framework was then developed from research questions and recurrent patterns in the data, with operational definitions recorded in analytical memos. During a second coding cycle, categories were compared across cases, refined, split, or merged when their boundaries overlapped, and complementary inductive codes were added when a distinct pattern recurred. Ambiguous and negative cases were retained and documented rather than forced into a category. The final core framework comprised eight analytical dimensions. A ninth post hoc dimension was added during the subsequent integrative analysis. All these analytical dimensions are presented in Table 1.

The four user profiles reported in Section 3.1 emerged from a post hoc integrative analysis within the broader category of interaction orientations. Drawing on a holistic comparison of each participant's prompts, initial and revised responses, and reflective comments, the analysis identified recurrent patterns in the roles assigned to ChatGPT. Each participant was subsequently assigned the predominant orientation most consistently observed across the activity. These profiles represent task-specific interaction patterns rather than stable learner characteristics.

In addition to the core coding framework, complementary inductive codes were incorporated to annotate specific phenomena relevant to the interpretation of the data. These included, for example, language switching, depersonalization, exemplification, incorporation of the documentary source into prompts, poor reading comprehension, absence of

independent judgement, reinforcement of the initial position, political disengagement, and expressions of the need for further information.

Table 1. Main analytical dimensions, coding categories, and analytical focus.

Analytical Dimension	Coding Categories	Analytical Focus
Prompt type	General, Replicative, Directive, Structured, Incomplete	Characteristics and degree of structuring of prompts
Response complexity	Descriptive, Analytical, Critical, Structurally elaborated	Level of interpretative and argumentative elaboration
Response reformulation	No substantive change, Expansion, Transformation	Changes observed in students' final responses after interaction with ChatGPT
Reliance on GenAI	Autonomous integration, AI-supported elaboration, Substitution	Degree of reliance on AI-generated content
Change in textual interpretation	Maintained, Official to Critical, Critical to Official, Ambivalent	Changes in the interpretation of the perspectives presented in the documentary source
Change in personal positioning	Maintained, Shift towards the Critical position, Shift towards the Official position, Ambivalent	Changes in students' personal positioning regarding the educational measures
Internal coherence	Internal inconsistency identified / No internal inconsistency identified	Consistency across students' responses
Metacognitive reflection	None, Basic, Critical	Reflection on prompt formulation and interaction with GenAI
Interaction orientation (post hoc)	Autonomy-preserving, Objectivity-seeking, Stance-attributing, Validation-seeking	Post hoc identification of the predominant role assigned to ChatGPT across the participant's complete case, based on prompts, revised responses, and reflective answers

The analysis did not evaluate the factual accuracy of ChatGPT outputs, and full outputs were not recorded. Consequently, reliance on GenAI was inferred from observable differences among the initial response, prompt, and revised response, together with students' reflective explanations when available. Codes such as AI-supported elaboration and substitution therefore describe patterns in the submitted texts; they do not establish verbatim copying or stable dependence on GenAI. This evidential boundary was applied consistently when interpreting the results.

3. Results

3.1. Patterns of Interaction with ChatGPT

The five prompts produced by each participant were examined jointly as part of the complete case. One prompt-type code was assigned to each participant according to the formulation, degree of structure, and function that best characterized their prompting across the activity. This constituted a holistic qualitative classification rather than an aggregation of five independently coded prompts. General prompts were the most common, followed by directive, replicative, structured, and incomplete prompts, as shown in Table 2.

The different prompt types reflected distinct ways of interacting with ChatGPT. General and replicative prompts were primarily oriented towards obtaining answers to the questionnaire, whereas directive prompts frequently sought confirmation, justification, or reinforcement of an already established interpretation. Structured prompts, by contrast,

incorporated explicit references to actors, causes, consequences, or interpretative criteria drawn from the documentary source.

Table 2. Distribution and characteristics of the predominant prompt types.

Prompt Type	n (%)	Description	Representative Prompt
General	39 (47.0)	Broad requests for information or confirmation without explicit analytical criteria.	"Can the critical approach agree with the official one?" (P09)
Replicative	11 (13.3)	Literal or near-literal reformulations of the questionnaire.	"Which social groups are affected by Jorge Macri's administration? Only students?" (P03)
Directive	19 (22.9)	Prompts guiding ChatGPT towards a predetermined answer or justification.	"I align with the critical perspective. Provide arguments to justify my position." (P20)
Structured	9 (10.8)	Prompts incorporating explicit analytical criteria or contextual information.	"Based on the text, answer this question in a maximum of four lines: Explain how the changes in schools are interpreted, who is responsible for them, why they are being implemented, and what their consequences are." (P25)
Incomplete	5 (6.0)	Incomplete prompts that did not constitute a clear request to ChatGPT.	"I agree with the critical perspective because it defends public education as a collective right. . ." (P01)

Note. Representative prompts have been translated from the original Catalan or Spanish.

Beyond prompt structure, the qualitative analysis identified four recurrent interaction orientations according to the functional role assigned to ChatGPT: autonomy-preserving, objectivity-seeking, stance-attributing, and validation-seeking. Autonomy-preserving users retained responsibility for the final interpretation by limiting, selectively incorporating, or rejecting generated contributions. Objectivity-seeking users reformulated personal or interpretative questions as if a single externally determinable answer were available. Stance-attributing users treated ChatGPT as if it held a political position, personal opinion, or feelings. Validation-seeking users asked the system to confirm, assess, justify, or reinforce a position they had already adopted. These profiles describe interaction patterns observed during the activity and not stable learner characteristics. Representative excerpts are presented in Table 3.

Table 3. Representative excerpts associated with the identified interaction orientations.

Interaction Orientation (User Profile)	Description	Representative Excerpts
Autonomy-preserving	The interaction limits, selectively incorporates, or rejects GenAI contributions while preserving the learner's responsibility for the final response.	"It is a personal assessment, I cannot ask ChatGPT to tell me my opinion." (P57) "I would not change anything because it is my opinion." (P44) "I would answer in the same way because it concerns my own opinion." (P47) "I would keep my answer because it is personal and reflects my own opinion, although the AI's response is not bad." (P83) "I would keep my own answer, because the one provided by ChatGPT does not express what I want to say." (P21)

Table 3. *Cont.*

Interaction Orientation (User Profile)	Description	Representative Excerpts
Objectivity-seeking	The interaction reframes an interpretive or personal judgement as if a single externally determinable answer were available.	“Analyze the text ‘El vaciamiento como política educativa’ and explain, concisely, which approach (official or critical) is more consistent to align with, considering the effects of school closures and grade mergers on the school community, teachers, and students. Provide only one word as the final answer.” (P58) “Objectively, which approach would be more appropriate in this article, the official or the critical one?” (P13) “Which is better, the official or the critical approach?” (P81)
Stance-attributing	The interaction treats ChatGPT as if it held an ideology, political position, or feelings.	“I position myself as critical, and you?” (P42); “Regarding the linked text, do you align more with the critical or the official perspective?” (P45) “Of the two perspectives (the official and the critical) which one do you identify with more, and why?” (P16) “Tell me in one word which perspective you align with regarding the text: official or critical.” (P06)
Validation-seeking	The interaction asks ChatGPT to identify, confirm, or provide supporting arguments for the learner’s own position.	“With which approach do you think I align regarding Jorge Macri’s administration, the official or the critical one?” (P82); “Which approach do I align with? Critical or official?” (P19) “I align with the critical perspective. Provide arguments to justify my position.” (P20)

Note. Representative quotations have been translated from the original Catalan or Spanish.

3.2. Response Complexity and Reformulation

Response complexity was coded once at the participant level following a holistic reading of the five revised responses. These responses constituted the primary evidence for classification, while the corresponding initial responses and prompts were used to contextualize the final level of elaboration. Responses coded as critical were the most frequent ($n = 52$, 62.7%), followed by analytical responses ($n = 22$, 26.5%), structurally elaborated responses ($n = 6$, 7.2%), and descriptive responses ($n = 3$, 3.6%).

Descriptive responses identified basic actors, causes, or consequences but showed limited relational or argumentative development. Analytical responses established connections between the causes, perspectives, and consequences presented in the documentary source. Responses coded as critical additionally incorporated evaluative or normative arguments related to educational rights, inequality, public education, or the social consequences of the measures. Structurally elaborated responses situated the educational decisions within broader institutional, political, or socioeconomic processes, such as the reduction in the role of the State, the transfer of costs to families, the prioritization of private education, or the reproduction of social inequalities.

At the participant level, one overall response-reformulation code was assigned after holistic comparison of the five initial and revised response pairs and their intervening prompts. Three response reformulation patterns were identified: no substantive change, expansion, and transformation (Table 4). No substantive change referred to revised responses that preserved the original interpretative framework with only minor stylistic or lexical modifications. Expansion involved the incorporation of additional arguments, actors, consequences, or contextual information while maintaining the initial orientation. Transformation described cases in which the revised response substantially reorganized the original discourse by introducing a different interpretative framework or argumentative structure.

One participant could not be classified in this dimension because no usable ChatGPT response was obtained during the activity. Among the remaining 82 participants, expansion was the most frequent pattern ($n = 47$, 57.3%), followed by no substantive change ($n = 18$, 22.0%) and transformation ($n = 17$, 20.7%).

Table 4. Representative examples of the three response reformulation patterns identified following interaction with ChatGPT.

Response Reformulation Type	n (%)	Initial Response	Prompt	Revised Response
No substantive change	18 (22.0)	“It presents and interprets the changes in schools by taking a position against them. The changes are caused by Milei’s new Argentine government. The reasons given by the government are the low school enrolment and that extending the school day would ensure that the established objectives are met. The consequences would be a less personalized education, staff reductions leading to dismissals, and changes of environment for children.” (P09)	“What are the key elements for interpreting an expository-argumentative text?” (P09)	“The text presents the situation of schools in Argentina caused by Milei’s new government as a change that represents a step backwards for the education system. The reasons given by the government are the low school enrolment and that extending the school day would ensure that the established objectives are met. The consequences would be a less personalized education, staff reductions leading to dismissals, and changes of environment for children.” (P09)
Expansion	47 (57.3)	“The Argentine government, due to the declining birth rate, has established a series of new educational laws under which public schools have to be merged. This has caused dissatisfaction within the school community because public school classes have become much more overcrowded and the quality of education is generally worse, as teachers are able to provide less attention due to the larger number of students. In addition, people with special educational needs are being affected because they receive insufficient support.” (P43)	“I am going to send you a text, a question about the text, and an answer. You must improve the answer.” (P43)	“The Argentine government, due to the declining birth rate, has established a series of new educational laws under which public schools have to be merged or even closed. This has caused dissatisfaction within the school community because public school classes have become much more overcrowded and the quality of education is generally worse, as teachers are able to provide less attention due to the larger number of students. The school community believes that private education is placed above public education as a result, and this represents a loss of identity for them. In addition, people with special educational needs are being affected because they receive insufficient support.” (P43)

Table 4. *Cont.*

Response Reformulation Type	n (%)	Initial Response	Prompt	Revised Response
Transformation	17 (20.7)	“It interprets the changes in schools as a reorganization or merger of classes caused by the Argentine government. The reason given is the declining birth rate.” (P25)	“Based on the text, answer this question in a maximum of four lines: Explain how the changes in schools are interpreted, who is responsible for them, why they are being implemented, and what their consequences are.” (P25)	“The text interprets the changes as a process of ‘emptying out’ public education, carried out by the Buenos Aires City Government under Jorge Macri. Officially, they are justified by the declining birth rate and the reorganization of resources, but the educational community sees them as a hidden austerity measure that favors private schools. The consequences include the loss of community identity, overcrowded classrooms, the violation of educational rights, and the weakening of the social role of public education.” (P25)

Note. Representative responses and prompts have been translated from the original Catalan or Spanish. Counts refer to participant-level holistic classifications. The excerpts illustrate individual interaction sequences within the corresponding participant cases. Percentages were calculated using the 82 participants for whom response reformulation could be classified.

The relationship between response complexity and reformulation was examined among the 82 participants for whom response reformulation could be classified. All three participants classified as descriptive showed no substantive change following interaction with ChatGPT. Among participants classified as analytical, expansion was the most frequent outcome ($n = 12$), followed by no substantive change ($n = 9$), while only one case was classified as transformation. Among the 51 participants classified as critical and included in this cross-dimensional comparison, expansion was the most frequent pattern ($n = 32$), followed by transformation ($n = 13$) and no substantive change ($n = 6$). The six participants classified as structurally elaborated were divided equally between expansion and transformation. One additional participant classified as critical could not be included because response reformulation could not be established.

3.3. Reliance on ChatGPT During Response Revision

Reliance on GenAI was coded once at the participant level through holistic comparison of the five complete interaction sequences and the reflective answers when relevant. The assigned category summarizes how the participant incorporated generated content across the activity.

The reformulation patterns presented above were accompanied by different levels of reliance on ChatGPT during response revision. Most participants used ChatGPT to support and elaborate their own responses, whereas smaller groups either integrated GenAI-generated content more autonomously or relied extensively on generated discourse to construct their final responses.

One participant could not be classified because no usable ChatGPT output was obtained. Among the 82 participants classified in this dimension, autonomous integration was identified in 14 participants (17.1%), AI-supported elaboration in 53 participants (64.6%), and substitution in 15 participants (18.3%).

Autonomous integration referred to cases in which students used ChatGPT selectively while preserving their own argumentative structure and retaining control over the final response. For example, P49 explicitly described the contribution of GenAI as primarily linguistic rather than conceptual:

“What the AI did was correct the spelling mistakes, add some textual connectors, make the text a little shorter, and change some words to give it a more formal tone, which makes it more pleasant to read. I like the AI’s answer better, but there is not that much difference compared to mine.”

This assessment was consistent with the prompt used:

“Hi, could you check the spelling mistakes and improve the wording of this answer while keeping the same content?”

Similarly, P21 explicitly rejected the generated response when it did not correspond to the intended meaning:

“I would keep my own answer, because the one provided by ChatGPT does not express what I want to say.”

AI-supported elaboration was the most frequent pattern. In these cases, students preserved their original interpretative orientation while incorporating arguments, concepts, or explanations suggested by ChatGPT. For example, P31 initially justified the critical perspective by referring to its capacity to move beyond a simple presentation of facts:

“I think the critical approach allows us to go beyond the facts and not only presents them but also analyses them and allows us to have a broader perspective.”

After interacting with ChatGPT, the participant maintained the same position but incorporated references to specific educational measures and strengthened the argumentative formulation:

“I think the critical approach is more appropriate because it not only presents the facts but also analyses them and offers us a broader view of the educational reality. I clearly position myself with this perspective, since closing classes, merging schools, and cutting resources are not just administrative decisions.”

Substitution was identified when the revised responses relied predominantly on GenAI-generated discourse and largely replaced the participants’ original formulations. P25, presented in Table 4 as an example of response transformation, also illustrates this pattern. The revised response introduced a substantially more developed conceptual and argumentative structure than the initial response, including notions such as hidden austerity, educational rights, community identity, and the social role of public education.

The participant placed the revised response in quotation marks, which may suggest that the generated text was inserted directly. However, because the complete outputs produced by ChatGPT were not recorded, it is not possible to verify whether the response was reproduced verbatim. The same limitation applies to other cases in which generated discourse may have been incorporated without being explicitly identified as such.

Response reformulation and reliance on ChatGPT were conceptually distinct but showed several recurrent relationships. Among the 82 participants with valid coding in both dimensions, 36 of the 47 expansions were associated with AI-supported elaboration, compared with six cases of substitution and five of autonomous integration. Transformations were equally divided between AI-supported elaboration and substitution, with eight cases in each category, while only one transformation occurred through autonomous integration. Cases involving no substantive change were mainly associated with AI-supported elaboration ($n = 9$) and autonomous integration ($n = 8$), with one case of substitution.

These patterns show that expansion was mostly produced through the incorporation of GenAI-generated elements into an existing interpretative framework. Transformation, by contrast, was more frequently associated with a greater contribution of generated discourse, although it could also occur when students maintained part of their initial reasoning.

3.4. *Changes in Textual Interpretation, Personal Positioning, and Internal Coherence*

Change in textual interpretation was established by comparing students' initial and revised responses concerning the perspective presented in the documentary source, with the intervening prompt used to contextualize the interaction. Change in personal positioning was established by comparing their initial and revised responses concerning the perspective with which they aligned. The subsequent justification sequence informed the analysis of students' reasoning and internal coherence but did not generate a second personal-positioning code. Internal coherence was evaluated holistically across each participant's complete case.

Most participants maintained both their interpretation of the documentary source and their personal positioning throughout the interaction with ChatGPT. Regarding the interpretation of the perspective presented in the documentary source, 81 participants could be classified. Of these, 73 maintained their initial interpretation, whereas eight changed their response after interacting with ChatGPT. Most of these changes involved a shift from identifying the perspective as official to identifying it as critical, although one transition in the opposite direction was also observed. Personal positioning was even more stable. Among the 79 participants classified in this dimension, 76 maintained their initial position. One participant shifted from the official to the critical position, one shifted from the critical to the official position, and one produced an ambivalent response. Changes in personal positioning were therefore infrequent.

Although changes were limited, some revised responses incorporated arguments or formulations that were not fully consistent with participants' previous answers. These cases did not necessarily involve an explicit change in personal position, but rather reflected partial inconsistencies between different responses provided by the same participant. In some cases, these inconsistencies appeared when students incorporated formulations associated with the interaction with GenAI while simultaneously maintaining elements of their original interpretation.

Closer examination of the cases in which participants changed their interpretation showed that these changes were not always associated with a more developed reading of the documentary source. In some cases, participants reformulated the task when interacting with ChatGPT by asking about Jorge Macri's political orientation rather than about the perspective presented in the documentary source. For example, one participant changed the initial answer from critical to official after using the following prompt:

"Jorge Macri's administration, as an Argentine politician, what kind of approach does it have: official or critical?"

In this case, the prompt redirected the interaction towards the politician's ideological orientation rather than towards the interpretation presented in the documentary source, and the revised response reflected this shift in focus.

By contrast, another participant initially identified the perspective as official and subsequently formulated the following prompt:

"Tell me whether the following statement is correct: 'Jorge Macri's administration has an official approach', or whether it would actually be a critical approach. Use the previous link if necessary."

Because the prompt explicitly referred to the previous source and asked for the initial statement to be evaluated, the revised response remained more closely connected to the

documentary source. The participant subsequently identified the perspective as critical and provided a more elaborated justification.

Internal coherence across participants' responses was generally maintained throughout the questionnaire. Five participants (6.0%) were coded as showing internal inconsistencies. These inconsistencies included tensions between the interpretation attributed to the documentary source, the participant's declared personal position, and the arguments incorporated into subsequent responses. Nevertheless, they represented a small proportion of the corpus and did not alter the overall pattern of stability in textual interpretation and personal positioning.

3.5. Metacognitive Reflection

Metacognitive reflection was coded once for each participant through the joint analysis of the last items. One question indicated whether students would modify their prompts, while another one provided the explanation used to determine the level of reflection. According to the analytical framework, three levels of reflection were identified: none, basic, and critical (Table 5). Most participants demonstrated basic metacognitive reflection, whereas only a small group showed critical reflection on prompt formulation and the reliability or appropriateness of the responses generated.

Table 5. Levels of metacognitive reflection identified after interaction with ChatGPT.

Level of Metacognitive Reflection	n (%)	Description	Representative Quotation
None	13 (15.7)	No meaningful reflection on the quality or formulation of the prompt.	"Mainly nothing, I think I approached it correctly." (P41)
Basic	60 (72.3)	General reflection recognizing that the prompt could have been more specific, clearer, or better formulated.	"I would have made the prompts more specific and direct, better specifying the word or line limit and asking for the answer to be written in simpler language, as if it were written by a student." (P07)
Critical	10 (12.0)	Reasoned evaluation of the prompt explaining how alternative formulations could have produced different or more appropriate responses.	"I would have improved the precision of the language by providing more context and clearly specifying the type and format of the response, as well as requesting justification and verification to address ethical considerations and ensure the reliability of the result." (P31) "Greater clarity and specificity by specifying the response format. Explicit context indicating the perspective and objective. Length limitations through a maximum number of lines or words. Ethical verification and data accuracy. Use of keywords and structure to focus the AI on the main points." (P58)

Note. Representative quotations have been translated from the original Catalan or Spanish.

The content of students' reflections differed not only in depth but also in focus. Participants demonstrating basic metacognitive reflection were predominantly oriented towards technical aspects of prompt formulation, such as increasing specificity, providing more contextual information, or defining the expected format of the response. By contrast, critical reflections went beyond these procedural aspects by considering how different prompt formulations could influence the quality, reliability, or appropriateness of the generated output. These responses frequently referred to the need for justification, verification, or

clearer analytical instructions, indicating a more deliberate awareness of the relationship between prompt design and the characteristics of the responses generated by ChatGPT.

Across both basic and critical reflections, several recurring themes emerged regarding how participants believed their prompts could be improved. The most frequent suggestions involved increasing specificity, providing additional contextual information, explicitly defining the expected response format, and limiting the length of the generated output. Participants who were showing more advanced metacognitive reflection additionally referred to the need for justification, verification of generated information, and the use of clearer analytical instructions or keywords to guide ChatGPT towards more appropriate responses.

These reflections were produced retrospectively, after participants had completed the interaction. They therefore represent students' own appraisal of how their prompts could have been formulated differently to obtain more useful responses.

3.6. Relationships Between Analytical Dimensions

Cross-dimensional comparison identified several associations among the analytical dimensions examined in the study, particularly between prompt type, response reformulation, reliance on ChatGPT, changes in textual interpretation, and metacognitive reflection.

Autonomous integration was identified only among participants classified as using general ($n = 8$), replicative ($n = 4$), or structured prompts ($n = 2$). No participant classified as directive or incomplete was coded as showing autonomous integration. By contrast, 17 of the 19 participants using predominantly directive prompts were classified as showing AI-supported elaboration, while the remaining two were classified as substitution. Similarly, all five participants using incomplete prompts relied on AI-supported elaboration.

Participants using structured prompts showed heterogeneous patterns of response reformulation. Among the nine participants using structured prompts, five showed no substantive change, two showed expansion, and two showed transformations. Their levels of reliance also varied across autonomous integration ($n = 2$), AI-supported elaboration ($n = 5$), and substitution ($n = 2$), whereas participants using general prompts displayed the widest range of reformulation patterns and reliance levels.

Changes in the interpretation attributed to the documentary source were concentrated among participants using directive and replicative prompts. Of the seven participants who changed from an official to a critical interpretation, five were classified as using directive prompts and two replicative prompts, whereas no changes were identified among participants using structured or incomplete prompts. Directive prompts in these cases commonly asked ChatGPT to determine, confirm, or justify whether the perspective presented in the documentary source should be interpreted as official or critical.

The relationship between metacognitive reflection and retrospective evaluations also revealed a consistent pattern. Sixty-three participants reported that they would modify their prompts after completing the activity, whereas 20 stated that they would not. Ten of the 13 participants showing no meaningful reflection said they would not modify their prompts. By contrast, all ten participants demonstrating critical reflection indicated that they would reformulate them. Moreover, although 81 participants reported that they regularly questioned the information they received, only ten were classified as demonstrating critical metacognitive reflection.

4. Discussion

4.1. Prompting Usage

The findings indicate that prompt detail and autonomous use were not equivalent. Structured prompts were associated with different ways of incorporating the generated response, including autonomous integration, AI-supported elaboration, and substitution.

Some prompts were formulated to organize the analysis by specifying relevant aspects or requesting justification. Others asked ChatGPT to confirm a previous answer, provide arguments supporting an already selected position, or determine which position should be adopted. The heterogeneous use of structured prompts reinforces this distinction: detailed instructions were associated with autonomous integration, AI-supported elaboration, and substitution. A formally precise prompt therefore cannot, by itself, be considered evidence that the student critically evaluated the generated response. Walter's (2024) view of prompting as an exercise in critical thinking is applicable when students use the prompt to define the problem, identify relevant elements, and request a reasoned explanation. It is less applicable when ChatGPT is mainly used to provide or validate an answer. The educational value of prompting thus depends on whether students continue to analyze the source, assess the generated response, and decide which arguments to incorporate.

4.2. Interaction Orientations and the Roles Assigned to ChatGPT

The four interaction orientations indicate that the educational significance of students' prompts lies not only in how they are formulated but also in the role assigned to ChatGPT during the interpretive process. Among them, the autonomy-preserving orientation is conceptually the most closely aligned with the conditions required for critical thinking, because students retained responsibility for interpreting the source and forming their final judgement, whether by limiting, selectively incorporating, or rejecting generated content. This does not mean that refusing to use ChatGPT or maintaining an initial response constitutes, by itself, evidence of critical thinking. Critical engagement also requires evaluating claims, comparing evidence, and justifying interpretive decisions. Nevertheless, retaining responsibility for the final judgement distinguishes this orientation from more passive, AI-directed forms of use that provide fewer opportunities for independent evaluation (Nasr et al. 2025; Melisa et al. 2025).

Students displaying an objectivity-seeking orientation reframed a contested interpretive question as if ChatGPT could resolve it through a single neutral answer. This pattern is consistent with the machine heuristic, whereby users may associate machine-generated outputs with qualities such as accuracy, impartiality, and objectivity (Yang and Sundar 2024). In the present study, prompts asking which position was "more objective", "more appropriate", or "better" transferred the resolution of an inherently interpretive choice to the system. This orientation should not be interpreted as indicating that students had already adopted a position and were seeking arguments to defend it; that function corresponds more closely to the validation-seeking orientation.

Students displaying what we describe as a validation-seeking orientation asked ChatGPT to identify or confirm their own position or to provide arguments supporting it. Related validation-seeking behavior has been identified in student–ChatGPT interactions, particularly when students seek confirmation of proposed solutions (Wu et al. 2026). In the present study, however, the object of validation was the student's own interpretive positioning. When ChatGPT was asked to determine this positioning, part of the evaluative work required by the activity was transferred to the system, a pattern consistent with broader accounts of passive AI-directed use and cognitive offloading (Nasr et al. 2025; Misiejuk et al. 2026). Nevertheless, seeking validation was not necessarily uncritical; its educational significance depended on whether students subsequently evaluated and justified the generated response.

Students displaying a stance-attributing orientation asked ChatGPT what it "thought" or which position it "would adopt". Research on stance attribution distinguishes between a design stance, in which a system's behavior is understood in terms of its designed functions, and an intentional stance, in which it is interpreted by attributing intentions, beliefs, or other mental states to the system (Lv et al. 2024b). The prompts identified in this study

can therefore be understood as a task-specific interactional form of the intentional stance, because ChatGPT was addressed as if it possessed an evaluative or political perspective of its own. This classification concerns how the interaction was framed and does not imply that students necessarily believed that ChatGPT literally possessed a mind. Nevertheless, it is consistent with evidence that users attribute intelligence- and agency-related capacities to large language models and that these attributions can influence their trust in generated advice (Colombatto et al. 2025).

4.3. Response Reformulation After Interaction with ChatGPT

As GenAI increasingly mediates students' meaning-making processes, the analysis distinguished three related but separate analytical dimensions: how students articulated an interpretation or personal stance; the observable changes between initial and revised responses; and the degree to which generated content was selected, modified, or rejected. This distinction is consistent with accounts of critical thinking as discourse (Kuhn 2019) and with research emphasizing active evaluation of GenAI-generated content (Kasneci et al. 2023). It also prevents a more elaborate final answer from being treated automatically as evidence of independent evaluation.

The dominant revision pattern was the expansion of students' initial responses through the addition of actors, consequences, contextual information, or further explanations. This pattern is compatible with studies suggesting that GenAI can support the elaboration and organization of information within guided educational activities (Liu and Wang 2024; Ruiz-Rojas et al. 2024; Nasr et al. 2025). In the present study, however, the clearest change concerned the content and formulation of the written response. The findings therefore distinguish between extending an answer and changing how the student interprets the issue. In several revised responses, existing ideas became more explicit or complete, but the data do not show whether this corresponded to a deeper understanding of the source.

This distinction is important because a longer, more formal, or more conceptually detailed response cannot be considered evidence of stronger critical thinking by itself. Some revised answers connected the educational measures described in the source with wider social consequences, whereas others mainly improved the wording or incorporated elements absent from the initial response. More substantial reformulations were also observed, but changes in structure or content do not establish whether students understood, evaluated, or accepted the newly introduced ideas. The study can identify changes in the written responses, but it cannot determine whether students' understanding changed to the same extent. Although GenAI may support the analysis of information when students examine the relevance and consistency of generated content (Area-Moreira and González-González 2026; Suriano et al. 2025), the present findings primarily show its role in extending and reorganizing written answers. They do not demonstrate the development of critical thinking as a competence.

4.4. Integration of ChatGPT-Generated Content into Revised Responses

The extent of response reformulation and the degree of reliance on generated content were separate dimensions, as students incorporated ChatGPT-generated content in substantially different ways. In some cases, the system was used selectively to improve wording, shorten the response, or correct linguistic errors while preserving the student's original meaning. Other students incorporated additional concepts, explanations, or arguments while maintaining the main orientation of their initial response. A further group produced revised answers in which much of the conceptual structure and wording differed from the original version. These patterns show that similar changes in the final text could result from different uses of ChatGPT. An expanded response, for example, could reflect selective incorporation of generated content or a much stronger reliance on the system. Likewise,

a substantial reformulation did not necessarily indicate that the student had abandoned the original interpretation, since some revised responses retained the initial position while adopting arguments or expressions introduced during the interaction.

This distinction is relevant because the degree of change in the written response does not reveal, by itself, how the student used or assessed the generated content. Selective use was most evident when students limited the requested changes or explicitly rejected a response that did not represent what they intended to say. In these cases, the final decision about what to include remained visible. By contrast, when the revised response introduced a markedly different conceptual structure, it became more difficult to determine which ideas had been understood, evaluated, or reformulated by the student. The findings are consistent with approaches that describe GenAI as a support resource when learners actively select, assess, and adapt its contributions (Area-Moreira and González-González 2026; Suriano et al. 2025). However, they also show that the presence of a more extensive or conceptually detailed final response does not establish that the student understood or evaluated the ideas added to the final response. This conclusion must remain cautious because the complete outputs generated by ChatGPT were not recorded. It is therefore not possible to determine whether particular passages were reproduced verbatim or to reconstruct precisely how each element of the final response was produced. The study can identify different degrees of incorporation of generated discourse, but it cannot determine whether these patterns reflect stable forms of dependence beyond the activity.

4.5. Stability and Changes in Students' Interpretations and Positions

Students generally maintained both their interpretation of the documentary source and their personal position after interacting with ChatGPT. This stability suggests that the tool was used mainly to extend, clarify, or support ideas that students had already expressed, rather than to reconsider the issue from a different perspective. Although GenAI can provide alternative arguments and facilitate comparison between viewpoints (Nasr et al. 2025; Alubthane 2026; Melisa et al. 2025), the prompts used in this activity did not consistently require students to examine competing interpretations. Requests for confirmation or justification were oriented towards reinforcing an existing answer rather than comparing competing interpretations. Interaction with ChatGPT was not accompanied by a systematic comparison of the official and critical perspectives. A comparison of the two perspectives would require students to examine the evidence, assumptions, and consequences associated with each one, rather than asking ChatGPT to select or validate a position.

The cases in which students changed their interpretation also require careful examination. A revised answer did not always reflect a more accurate or detailed reading of the documentary source. In one interaction, the prompt shifted the focus from identifying the perspective presented in the text to classifying the political position of the public official discussed in it. In this case, the change reflected an answer to a different question rather than a reconsideration of the original evidence. Other changes remained more closely connected to the source and included a clearer justification of the perspective attributed to it. These differences show that a change between the initial and revised response cannot automatically be interpreted as improvement. Its relevance depends on whether the revised answer addresses the original task, remains consistent with the documentary evidence, and provides a justified explanation. The occasional inconsistencies found across students' responses reinforce this point. Some final answers combined newly incorporated arguments with earlier interpretations or personal positions that were not fully compatible. However, the general stability of students' positions indicates that these inconsistencies were localized rather than representative of the overall interaction. From the perspective of Social Sciences education, the findings underline the need to distinguish between identifying the

perspective of a source, adopting a personal position, and justifying that position through evidence (Santisteban 2019). ChatGPT may support each of these processes, but it should not replace the comparison and evaluation required to connect them coherently.

4.6. Metacognitive Reflection on Prompting and Response Reliability

Students' reflections focused mainly on how prompts could be made clearer, more specific, or better adapted to the expected response format. This shows that many participants recognized a relationship between the formulation of the prompt and the usefulness of the output obtained. Students' reflections generally concerned procedural improvements, such as adding context, limiting the length of the answer, or specifying the desired style. References to reliability, justification, and verification were less prominent. The findings therefore distinguish between improving a prompt to obtain a more suitable answer and evaluating whether that answer should be accepted. This distinction is relevant because effective interaction with GenAI requires more than the ability to formulate precise instructions. It also requires students to assess the evidence, consistency, and limitations of the generated content. In this respect, the results support approaches that place critical evaluation and metacognitive reflection at the center of educational uses of GenAI (Area-Moreira and González-González 2026; Morote and Colomer 2024).

The difference between students' general claims that they questioned information and the less frequent evidence of critical evaluation in their retrospective reflections should also be interpreted cautiously. Declaring that information is questioned does not demonstrate that claims were checked against the documentary source, compared with external evidence, or rejected when unsupported. The activity captured students' retrospective evaluation of their prompts, but it did not systematically record verification practices. The findings therefore do not show that students applied fact-checking or source-validation procedures during the interaction. References to verification and source validation were less prominent than references to prompt clarity, context, and response format. This result is consistent with the emphasis placed on verification and informed trust in the literature (Bond et al. 2024; Wolfe and Mitra 2024; Rahman et al. 2026). The findings relate mainly to the evaluation component of Codina's (2024) KEP model; students' understanding of GenAI systems, privacy, attribution, and information preservation was not examined. The main educational implication is therefore not simply to teach students how to obtain better responses, but to require them to justify why generated information is accepted, modified, or rejected.

For higher education teaching, these findings suggest that GenAI activities should require students not only to formulate prompts, but also to compare, justify, and evaluate generated responses. Teaching should therefore focus on how students assess and incorporate AI-generated content, rather than on prompt quality alone.

5. Conclusions

This study examined how university first-year Education students used ChatGPT during the interpretation of a documentary source and how the generated content was reflected in their revised responses. The findings show that prompt detail and autonomous use were not equivalent. Structured prompts could be followed by selective integration, AI-supported elaboration, or substitution, indicating that prompt form alone does not reveal how students evaluate and incorporate generated content. The role assigned to ChatGPT was also relevant: some prompts organized the analysis or requested justification, whereas others asked the system to confirm an answer, provide arguments for a previously selected position, or identify the student's own alignment.

One contribution of this study is the identification of four recurrent user profiles within the broader analytical category of interaction orientations: autonomy-preserving, objectivity-

seeking, stance-attributing, and validation-seeking. Each participant was assigned one profile based on the role attributed to ChatGPT across the complete activity. These profiles distinguish whether students retained responsibility for the final interpretation, sought an externally determined answer, attributed a personal stance to the system, or requested confirmation or reinforcement of a previously adopted position. They represent task-specific interaction patterns rather than stable learner characteristics. Prompts were therefore interpreted alongside the corresponding initial responses, revised responses, and reflective explanations.

Finally, the study reinforces the importance of integrating GenAI into educational contexts through pedagogical approaches that require verification, reflective use, and critical evaluation of generated content. Students' reflections focused mainly on procedural aspects of prompt formulation, whereas references to verification, justification, and source evaluation were less prominent. Higher education activities should therefore address not only how students formulate prompts, but also how they compare generated responses with the original source, justify which elements they accept or reject, and verify unsupported claims. These practices may help students use GenAI to revise and extend their responses while retaining responsibility for interpreting and evaluating information.

Overall, interaction with ChatGPT was associated mainly with the expansion and reformulation of students' written responses. However, these changes were heterogeneous and cannot be interpreted as evidence of critical thinking development. More detailed or formally developed responses did not necessarily demonstrate that students had evaluated or incorporated the underlying ideas. The findings therefore support educational approaches that combine prompt formulation with verification, evaluation, and reflection on the use of generated content.

5.1. Limitations

This study has several limitations that should be considered when interpreting the findings. First, it was conducted in a single institution with first-year teacher education students completing a specific classroom task. The findings are therefore closely linked to this educational context and should not be generalized to other student populations, disciplines, institutions, or higher education settings. Second, the study examined a one-off classroom activity with ChatGPT and did not include longitudinal evidence. It cannot determine whether the observed interaction patterns persisted, changed with experience, or influenced students' subsequent use of GenAI. The exclusive use of ChatGPT also limits the applicability of the findings to other generative systems, particularly given the rapid development of these technologies and continuing changes in their capabilities and response behavior.

Beyond the binary item on previous AI use, no systematic information was collected regarding frequency of use or prior training in AI literacy, prompting, and information verification. These differences may have influenced how participants formulated prompts, assessed generated responses, and incorporated them into their revised answers. In addition, the complete outputs generated by ChatGPT were not recorded, which prevents a precise reconstruction of how particular ideas or formulations entered the final responses and whether any passages were reproduced verbatim.

Finally, the qualitative comparison of initial and revised responses was not designed to establish causal effects. The observed revisions cannot be attributed exclusively to ChatGPT, as they may also have been influenced by repeated writing, additional time for reflection, the structure of the activity, or the initial framing of the documentary source. The findings should therefore be interpreted as situated patterns observed during this activity rather than as causal or permanent effects of GenAI use.

5.2. Implications and Future Research

This study has implications for the design of educational activities involving GenAI. The findings suggest that critical evaluation does not necessarily emerge from interaction with ChatGPT alone. Activities may therefore benefit from explicit requirements to verify information, compare generated content with reliable sources, and relate it to prior knowledge (Codina 2024; Liu and Wang 2024; Ruiz-Rojas et al. 2024). Although structured prompts can make an analytical task more explicit, the results indicate that prompt structure alone does not ensure autonomous interpretation or evaluation of generated content. Post-interaction review may provide an opportunity for students to explain which elements they accepted, modified, rejected, or considered necessary to verify.

The findings also show that analytical instructions and structured prompts did not consistently correspond to autonomous evaluation. This qualifies approaches emphasizing GenAI's capacity to facilitate access to multiple perspectives (Nasr et al. 2025; Alubthane 2026; Melisa et al. 2025), since access to alternative perspectives does not, by itself, demonstrate that students critically compared or assessed them.

On this basis, educational activities involving GenAI could incorporate verification guidelines, analytical prompts, opportunities for subsequent reflection, and explicit criteria for evaluating generated outputs. These measures were not examined directly in the present study and should therefore be understood as pedagogical proposals derived from the observed interaction patterns. Table 6 summarizes these proposals, while Table 7 identifies directions for future research through which their educational relevance and effectiveness could be examined.

Table 6. Practical measures.

Area	Practical Measure	Pedagogical Objective
Guided prompt design	Analytical prompt templates incorporating verification criteria, keywords, and requests for justification.	Promote critical prompting and avoid superficial formulations.
	Prompt-quality rubrics.	Help students distinguish between basic and advanced prompts.
Systematic verification	Mandatory cross-checking against reliable sources, such as academic articles, reports, and official data.	Strengthen the validation of information generated by GenAI.
	Identification of three discrepancies between GenAI outputs and external sources.	Develop skills for detecting errors and inconsistencies.
	Triangulation activities combining GenAI, documentary sources, and prior knowledge.	Integrate multiple perspectives and strengthen critical judgement.
Post-interaction reflection	Structured opportunities for retrospective review.	Activate metacognition after examining the generated output.
	Guiding questions, such as “What would I have changed?”, “What would I have verified?”, and “What limitations can I identify?”	Improve students’ capacity for self-assessment and critical review.
Prior knowledge	Explicitly state prior knowledge before interacting with GenAI.	Situate the generated response in relation to what the student already knows.
	Compare areas of agreement, contradiction, and elaboration.	Strengthen students’ capacity for comparison and synthesis.
Critical reading of generative outputs	Short instructional sessions on hallucinations, biases, and oversimplifications.	Prepare students to identify common errors in GenAI outputs.
	Identify indicators of reliability in generated responses.	Improve students’ ability to assess output quality.

Table 7. Future research directions.

Area	Research Direction	Objective
Development of critical thinking	Examine the development of critical thinking through prolonged use of GenAI.	Determine whether sustained practice enhances metacognitive awareness.
Prior knowledge	Analyze how prior knowledge influences prompting quality.	Understand how students integrate GenAI into their existing conceptual frameworks.
Comparison of generative models	Compare different GenAI systems, such as ChatGPT, Claude, and Gemini.	Identify which models are most conducive to critical reflection.
Assessment of critical prompting	Develop and validate rubrics for critical prompting competence.	Systematically assess the quality of interactions with GenAI.

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Abbreviations

The following abbreviations are used in this manuscript:

AI	Artificial Intelligence
GenAI	Generative Artificial Intelligence
KEP	Know, Evaluate and Preserve

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