

Research projects of the Department of Communication postgraduate programmes  
**Master's Degree Final Projects in Digital Culture and Emerging Media**

Ph.D. Thesis Proposal

**An interdisciplinary and applied approach to  
Generative Artificial Intelligence in Secondary School for  
the development of communicative competencies**

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## **Applied Ph.D. Thesis Proposal**

### **Abstract:**

This applied thesis project is conceived in a moment of profound technical and social transformation and aims to critically and deeply explore the integration of Generative Artificial Intelligence (GenAI) in post-compulsory education in the Spanish setting. To achieve this, it acquires a multidisciplinary perspective focused on the development of the new communicative competencies that emerge as fundamental in this new context, and along with the educational community, it seeks to produce reference material, usage guides, and visuals that reflect on the ethical dilemmas of GenAI, and invite a critical look on the extensive use of these systems in education.

### **Keywords:**

Generative Artificial Intelligence (GenAI), AI Literacy, Educational Transformation, Artificial Intelligence in Education (AIEd), Communicative Competencies

## **1. Introduction**

We are immersed in one of the most significant technological and cultural paradigm shifts in the history of mankind, sparked by the proliferation of Generative Artificial Intelligence (GenAI). This unprecedented technical evolution demands a major restructuring and rethinking of our cultural models, the interactions we have with technology, and our ways of learning, producing, and consuming culture of all kinds. In this context of acceleration and need for change, this project emerges with a strong commitment to, on one hand, leverage the full potential of GenAI in Education, and on the other hand, to critically examine its use by students and how they appropriate this technology, to promote responsible, safe and sustainable use.

The application of algorithms and Artificial Intelligence (AI) in education has been gaining attention recently from both a theoretical and practical point of view (Chen et al., 2020), and in particular such important areas as the personalization of educational content, the emergence of innovative pedagogical methods, technology-enhanced assessment, and changes in student-teacher communication (Chassignol et al., 2018) appear to guide this necessary educational transformation. This thesis project is conceived from an applied approach, as it aims to combine a theoretical prospection and review with the production and co-creation of useful and relevant material that can be used in GenAI-mediated education.

Beyond the social interest in critically examining these technologies and the concerns raised by their future massive introduction into society, perhaps the most important thing that highlights the relevance of this project is that it deals with a new social reality and a research topic of growing interest as some scholars have already begun to explore the use of AI systems in education (e.g., Ng et al. 2022; Li 2023). The use of GenAI has grown in many classrooms, often kept in secret from the teachers, and there is doubt, concern, and uncertainty about what the future of education should be in environments where GenAI will be increasingly present.

In this sense, the *raison d'être* of this thesis is driven by the need for ethical and responsible implementation of GenAI systems in education that, motivate a change in the teaching and learning logic, adapting them to the current media ecosystem, and put the student at the center of the educational program design, inviting them to critically and organically reflect on

the ethical aspects of the use of the AI-powered tools while acquiring new necessary communicative skills. In order to narrow down the research, this thesis project will focus on secondary school and will especially look at the development of communicative competencies; this limitation of scope will be explained in the Research Design section.

In summary, this research proposal seeks to explore and construct an interdisciplinary and practical framework that leverages the transformative potential of GenAI within secondary school, with a specific emphasis on nurturing communicative competencies. The significance of this proposal lies in its capacity to answer to the evolving demands of our dynamic society, where technology plays a central role, and it is more necessary than ever to review it with a critical and honest look. By embarking on this academic journey, the author aspires to shape the future of education and unlock its true potential through the ethical and responsible integration of Generative Artificial Intelligence.

## **2. Research design**

As already noted in the introduction, we are at a turning point in regard to the widespread use of GenAI, with education being one of the areas more likely to change and transform in the future with the use of these technologies. This section aims to explain the two key research questions that spark this project, as well as the objectives to be fulfilled during the doctoral thesis.

The first research question that emerges from this situation is related to the skillful and operative component of the use of GenAI in secondary school, especially related to a clear research problem that is evidenced by the use of new AI tools to solve the same tasks and to address the same learning paths that have been traditionally established in the past. This research question opens the first phase of the project:

*What specific educational skills remain relevant in the context where Generative Artificial Intelligence (GenAI) is already integrated into students' daily toolkits, and what new competencies emerge as essential in this technological landscape?*

This research question goes directly to the root of one of the great current concerns that not only seeks to criticize and review traditional competencies that may become obsolete, but also to propose and address new competencies that appear in AI-mediated contexts, the combination of which has been called AI literacy by some scholars (e.g., Ng et al. 2022). A mixed-methods approach will be employed to answer this research question, consisting of a literature review along with qualitative data collection methods such as interviews and focus groups to gather insights and perspectives from educators, experts in AI and education, and students themselves. The sample for this research question will consist of educators, experts in AI and education, and students from secondary schools. The participants will be selected through random sampling to ensure a diverse range of perspectives and experiences. Related to this question, the first objective of this project is proposed:

- Analyze and understand the new competencies emerging from AI-Mediated Communication (AI-MC) applied to the post-compulsory educational environment with a focus on communicative competencies.

The fulfillment of this first objective will give a solid ground on which I will work to achieve the next objectives and answer the other main research question of this project, which deals with a much more practical dimension in contact with students. This question inquires about the ways in which students approach GenAI in order to propose ways of integrating AI in education that engage with the use that is being made of these technologies.

*What specific forms of appropriation do students make of GenAI and how can these approaches be effectively integrated into education while aligning with the assessed competencies?*

To answer this second question, qualitative methodologies will be addressed, involving in-depth observations of students' interactions with GenAI technologies in educational settings. The purpose of this question is to reason about common spaces between students and researchers since some of the scholars propose new uses of AI in Education without taking into account the students' motivations, approaches, and strategies regarding its use. Therefore, co-creation dynamics will be proposed so that the student is actively involved in this process. The sampling strategy will be maintained as in the previous one throughout this phase as well. In this regard, the following objective is proposed:

- Observe and analyze the strategies, motivations, and usage made by students with GenAI in order to understand and comprehend the forms of appropriation of this technology.

This objective is intended to incorporate students, together with their experience, at the center of the design of new ways of learning. Understanding how students appropriate this technology can be key to addressing the purpose of this thesis in an effective, comprehensive, and realistic way. The last objective of this thesis project is the most practical, and its achievement would be part of the last phase of the thesis project. Beyond simple theoretical inquiries, this project is conceived to make a real impact and provide guidelines and useful material for the sustainable and responsible incorporation of GenAI in education. That is why, collecting the results of the two previous objectives, this last one states as it follows:

- Co-create, along with students and teachers, support material and visuals that gather all the knowledge of the project and act as reference guides in obtaining and developing the identified competencies and communicative skills, besides promoting the responsible and ethical use of GenAI in education.

This objective does not intend to remain simply in the proposal of guides, but rather it addresses the implementation of AI from an interdisciplinary perspective. That is why it is also proposed the creation of visuals that helps the incorporation of these systems in the daily life of the classroom, being these project's frameworks of reference both in their creation and in their application for future research on the implementation of GenAI systems in schools.

This applied thesis project is designed to be developed in 3 phases, which will be explained in the timeline section. For each phase, it is expected to publish one or more papers that provide answers to the established objectives, so it is intended to produce a thesis by compendium, which by collecting the published papers, has a unitary sense and addresses the research questions stated at the beginning.

### **3. Theoretical framework**

As mentioned above, GenAI is a very recent field and it is still difficult to find solid theoretical foundations or broad consensus on the key concepts that delimit this field of research. Despite that, some scholars have already produced some first theoretical investigations that have served as a foundation for the first works. This section will explore the most important theoretical notions that frame this research.

When carrying out research in communication and AI, it is important to acknowledge the particularities of this domain, especially regarding the role of AI systems in communication processes and the characteristics of what has been called AI-mediated communication (AI-MC). In fact, the name AI-MC itself reveals the traditional conception of AI in communication processes as a mere mediator. This notion is becoming obsolete and some authors are already endowing AI with meaningful agency and attributing to it a role as a communicative agent (e.g. Gunkel, 2012; Guzman & Lewis, 2019). While attempts have been made to clarify the different roles of AI in communication by establishing sealed categories (Sundar & Lee, 2022), it has also been pointed out the possible conceptualization of AI roles as a continuum where several factors can make the role of AI vary along the continuum, from one end of solely mediating communication to the other end where AI can be conceived as just another communicating subject (Valverde-Valencia, 2023). These notions about the role of AI highlight the uniqueness of this field and the importance of a particular theoretical framework for AI-MC.

The aforementioned new communicative roles of AI are affecting the ways scholars approach the issues of this research field. The presence of AI in communicative activities affects the messages displayed by modifying, augmenting or even generating them and operating, many times, on behalf of a communicator (Hancock et al., 2020) affecting multiple domains and requiring scholars to connect and resort to different areas of knowledge, rather than only communication research, to properly address the challenges that emerge in that context (Yao & Ling, 2020), highlighting again the need for transdisciplinary studies.

Regarding the forms that AI research takes, it has also been shown that, although this field is something totally new, adopting classical communication perspectives can be especially useful to approach AI-MC phenomena. For example, interpersonal communication logic can



be adopted to delve deeper into the intimate interactions between users and AIs (e.g. Brandtzaeg et al., 2022) or explore new dimensions of the media effects of human-AI interaction (HAI) through the application of classical self-effect theories (e.g. Valverde-Valencia, 2023), showing the importance of understanding that AI research does not exist in isolation from other communication theories (Yao & Ling, 2020).

To encompass this interdisciplinary landscape in a comprehensive way, foresight in relation to future scenarios is an important part of AI research as it provides directions in which research should be oriented. More specifically, in the context of GenAI, some scholars have proposed interesting models that allow us to envision the immediate future we will be facing. For example, Guerrero-Solé (2022) proposes An Integrated Model of Artificial Intelligence-Mediated Communication Effects (IMAGINE) suggesting the possibility of AI taking on roles beyond those traditionally described, such as roles of Reception (i.e. fMRI diagnostics) or algorithmic negotiation. The comprehensive approach of this type of research allows to become aware of the risks and dangers of the massive integration of GenAI systems and to conduct research into the most important areas that these models highlight. Thus, research on AI effects becomes relevant, especially delving into HAI and the strategies and motivations of users when approaching GenAI systems, in the broadest sense of the term.

Beyond text generation, ChatGPT, and other AI-based assistants, GenAI refers to AI models capable of generating original and creative content, such as texts, images, videos, and music, through unique algorithms that allow the recognition of patterns derived from previously provided examples (Hsu & Ching, 2023). This technology has already shown significant potential in many different domains, which makes its output increasingly difficult to distinguish from human-made and that eventually ends up displaying very similarly to human-generated content (Cheng, 2022). Its application within the educational field offers both exciting opportunities and challenges. Some scholars have identified up to 39 different possible ethical conflicts when using AI, including lack of quality data and bias and discrimination (Stahl, 2021), but when reviewing the implementation of AI in education, the concerns should not be only related to plagiarism or the use of unverified information, but also about the ideological underlying foundations of these technologies, the educational skills that are still relevant today and the ethical guidelines that should be followed when making use of these systems.

Some articles have provided guidance on what Artificial Intelligence in Education (AIEd) should be, pointing to the challenges in this field, as well as the ways in which this implementation should be embodied (see e.g. Luckin et al., 2016; Montebello, 2018). Moreover, this area has received special attention from supranational institutions seeking to address the doubts and concerns raised by the current uncertainty. The report *Artificial Intelligence in Education: challenges and opportunities for sustainable development* by Pedró et al. (2019) is a major step by UNESCO's education sector that largely addresses some of the most important issues, such as the personalization of educational content, the necessary preparation of students for an AI future and the long-term implications of this implementation. Some of the practical research that has been carried out in the field of AIEd will be explained in detail in the State of the Question section, where some of the most recent applied research in the field will be reviewed.

Despite attempts to theorize about AIEd, there is still a lack of specificity in terms of key concepts. Many of the reports assume vertical visions where some of the most commonly used topics are repeated, focusing on the operational part of AI and leaving aside the communicative possibilities of GenAI systems. For example, in the report by Pedró et al. (2019), the emphasis is placed on the possibilities for hyper-personalization of education or on the transformations of educational programs to allow greater adaptability to changes introduced by AI, but the role that students should play in this design process is not addressed. In fact, some studies already state the importance of student empowerment to take advantage of the potential of this technology (Hsu & Ching, 2023) or the importance of receiving feedback from student's experiences when integrating AI systems into learning (Alkaissi & McFarlane, 2023), being one of the main aspects of this project.

In summary, this theoretical framework attempts to briefly describe the complex landscape of GenAI research, highlighting the need for a specific theoretical approach for AI-MC considering the changing roles of AI in communication, and combining classical communication theories along with emergent perspectives. Lastly, the importance of foresight to understand the complexity and the consequences of GenAI development, and the considerations surrounding AI in education contribute to a broader understanding of the field, while underscoring the need for research that actively involves and empowers the students.

#### **4. State of the Question and Literature Review**

For years there have been studies that analyze, evaluate, and claim a prominent role of AI in education. Some of these investigations emphasize the need to bridge the gap between the technological development of AI and its educational applications (Zhang & Aslan, 2021), and this is why an interdisciplinary vision is more necessary than ever. The focus of this project is in line with the author's previous research regarding GenAI which connects disciplines such as Psychology, Engineering, and Communication.

Even if it is somewhat socially accepted that attributes such as human creativity or complex relationships are not as susceptible to automation by AI (Frey, 2019), the increasingly intimate interaction of humans with AI, conceived as analogous to human interaction (Waddell et al., 2015), and the irruption of GenAI as a creative tool, force us to reconsider this educational paradigm and the skills linked to it. In line with the objectives described, it is relevant to know the current research dedicated to the new skills that appear in AI-mediated environments. However, it should be noted that this literature is eminently theoretical and the need for empirical research that studies the competencies needed to use AI effectively has become evident (Anton et al., 2020). Thus, some of the competencies or skills highlighted in the literature are related to critical thinking, ethical leadership, social skills, and teamwork (e.g. French & Poole, 2020), but there is a notable lack of specificity considering the current situation. In addition, works such as those carried out by Guerrero-Pico, Establés, & Costa Sánchez (2022) can be used as a reference to observe how research on new media competencies has been approached in the Spanish teenage context, which is in line with the one proposed in this thesis project.

This thesis project aims to solve this lack of concreteness through a review of recent studies and an application of GenAI in educational processes. Beyond the theoretical contributions reviewed before, this research also takes reference from some recent practical studies that address GenAI in education such as Baidoo-Anu & Owusu Ansah (2023), where they conducted a study on the potential benefits of ChatGPT in learning. Nevertheless, the rapid reaction of scholars to these AI systems has not provided yet profound conclusions and the contributions of these articles end up being superficial. A research framed in a Ph.D. program can provide a much greater depth of analysis and proposal than the currently found in the literature.

Although, currently, scholars are focused on the use of ChatGPT, the present study is not limited to this type of GenAI, but draws on an extensive use of AI multimedia content generation. In addition, the focus on GenAI systems such as Stable Diffusion, or Runway's video-generating Gen1, will allow to deal with systems that are currently not receiving academic attention, in spite of its social and technological relevance, and to explore much more diverse expression capabilities aligned with communicative competencies. Another contribution this project can make is a proposal for a reinterpretation of educational competencies on a much more global and global scale, not limited only to media literacy.

Ng et al. (2022) explore some approaches to the use of AI systems in the classroom and also highlight the need to assess the new competencies that emerge in AI-mediated environments. The results show how students, based on doing AI Digital Story Writing, developed the targeted competencies within the logic of AI literacy and were also able to reflect on its limits and the importance of ethics in the use of these systems. Thus, it is shown how the use of AI in certain school environments can not only provide advantages in the development of skills but also improve students' knowledge of AI systems. Another relevant point of this research is the age restriction, limiting to elementary school and providing more specific and applicable results.

Another research that shapes the current state of the art about AI and education is the one presented by Abdelghani et al. (2022) where GPT3 is used to drive pedagogical agents that stimulate children's curiosity through question-asking skills. This research proposes an innovative methodology to implement, in this case, the use of Large Language Models (LLM) in pedagogical dynamics. The methodological framework suggest new ways of approaching AIEd, such as the to use “prompt-based learning” to develop tasks. This technique allows students to communicate in natural language with AI and exploit the full educational potential of conversational agents. In addition, the use of “prompt-based learning” makes it possible to observe different strategies of use that emerge from the interaction between the student and the AI, generating personalized educational environments that allow the student to explore those dimensions of knowledge more akin to his or her personality.

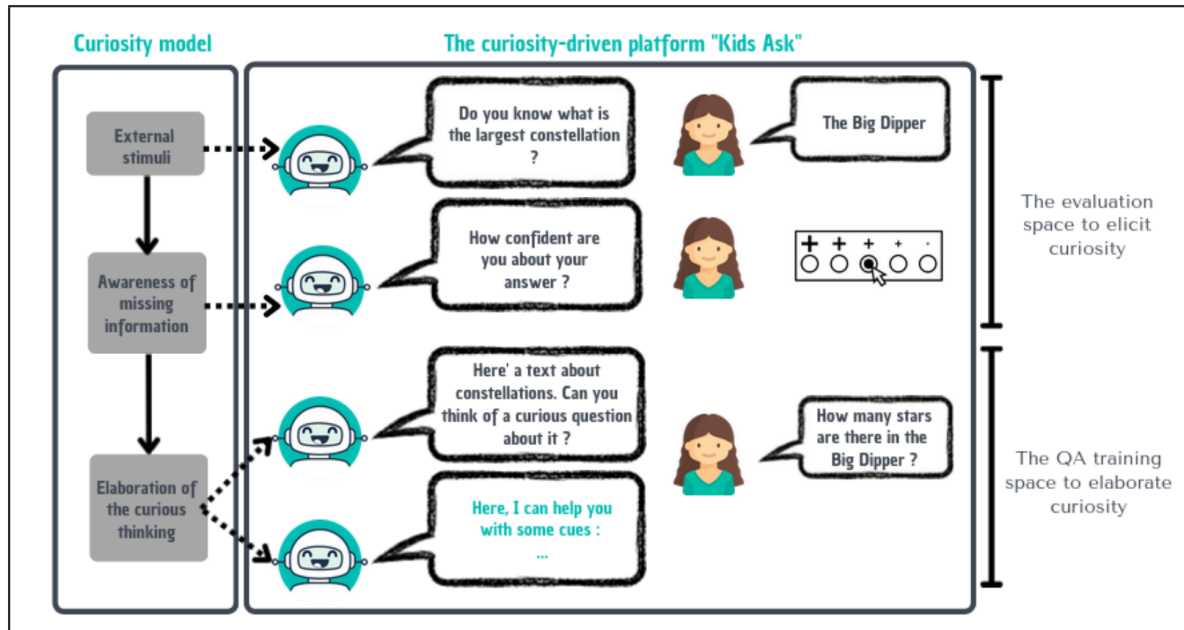


Figure 1: Illustration by Abdelghani et al. (2022) where the interaction flow between children and AI is shown, as an example of practical research applying GenAI in the development of specific skills.

A similar approach can be found in Koyuturk et al. (2023), however with a more technical approach. Despite the limitations of LLM models for educational purposes, throughout this study, it was possible to adjust the behavior of this AI to adapt it to the desired role, in this case of a teacher. In this paper, the value of the prompt-based approach is again demonstrated when dealing with GenAI for educational purposes.

Finally, this project is intended to take part in post-compulsory education, especially for high school students. As already seen, the age restriction is important in order to reach much more useful results. The specific need for a reconsideration of the educational model in higher education that takes into account AI (Ocaña-Fernández et al., 2019), added to the level of competence and knowledge that students acquire at this stage, makes this period particularly interesting for an intervention such as the one proposed. This stage is characterized by being the prelude, in most cases, to the students' specialization in a university career and is where the critical review of communicative competencies becomes relevant and the acquisition of new communicative competencies that make use of GenAI at this educational stage can mean a radical change in the way students approach superior studies.

## **5. Methodology**

Since some methodological notes have been made in the Research Design part, this section will explore special methodological considerations regarding the different phases of the thesis. This applied research has basically two dimensions: an analytical one, which would tie with the first stages of the project; and a propositional dimension, which would gather the results and conclusions of the analysis to co-create and produce the content linked to the project. The first analytical part will be based on a mixed methodology. On the one hand, there will be an important quantitative work, which will dialogue with the main research in this field; and, on the other hand, a qualitative part that will connect both education professionals and theoreticians as well as students, through interviews and focus groups to draw relevant conclusions, as already explained in the research design section. This analysis is intended to answer the first research questions that seek to find the key competencies of the new educational environments mediated by AI.

Within this analysis, qualitative work with students is planned, consisting of qualitative-based participant sessions and discussion groups in which it will be observed the ways in which students use and reappropriate GenAI. For this part of the fieldwork, goals can be set in order to observe how the students are able to undertake tasks using GenAI and to know what frictions and barriers they encounter. Some of the research highlighted in the previous section such as Abdelghani et al. (2022) or Ng et al. (2022) are used as methodological references. In addition, special attention will be paid to forms of hacking or alternative uses that arise from these interactions in order to observe the frontiers and limits that students are able to overcome. This approach also seeks to observe whether students, through bypassing certain usage controls contained in GenAI, are able to build a critical opinion of these systems.

As this first part of the research is developed, a parallel study of the current interventions that exist around the incorporation of AI in education will be carried out, seeking, above all, applied investigations. Thus, it will be possible to analyze more extensively those academic contributions that explore this field and thus expand the state of the question previously exposed. This review is intended to draw conclusions about the most optimal ways to incorporate AI-driven technology in the classroom and evaluate the failures and weaknesses of these applications to generate a much more robust and solid educational reference model.

The last methodological note is related to the creation of resources for the application of what has been stated in the theoretical sections. Firstly, this project aims to create educational content that can serve as a reference for both students and teachers. This material will be based on the conclusions drawn from the qualitative analysis since it is intended to be something that comes from the educational community itself. These resources may range from responsible use guides, co-creation workshops, and talks to the new evaluation methods and the incorporation of GenAI by teachers. The other part of the project will be the elaboration of visual works that mix some of the theoretical notes that have been discussed and that induce an attentive reflection on the debates that arise around Artificial Intelligence. These works will be closely related to the means of consumption of this generation and will have a multimodal and transmedia nature. The aim of this creation is not simply to offer fictional products, but to make consumers, in this case, students, reflect through the consumption of this content but also through the understanding of how these textual pieces have been created, so that they adopt a critical and reflective view on the extensive use of GenAI.

Another important methodological note is the concretion of the GenAI models to be used. In this case, the thesis project will adopt the models derived from Stable Diffusion, both for image and video generation. The choice of this software over the rest is due to the open-source character of Stable Diffusion and the possibility of high customization of this model for educational purposes, in addition to greater flexibility in the licenses of use, both at legal and economic levels that will ease the implementation of this AI in specific environments.

This methodological section is open to possible new incorporations of AI in the research process. As this is a thesis by compendium, it has been attempted to provide a methodological reference to be used as a guide, but again, the methodology of each article to be published will be adapted to the state of the art at that time, always looking for an updated development of GenAI systems, along with a critical look at their use.

Table 1 summarizes the objectives, the research questions, the methodology to be used, the sample to be chosen, and the expected results.

Objectives	Research Question	Methodology	Sample	Expected Results
Analyze and understand the new competencies emerging from AI-Mediated Communication (AI-MC) applied to the post-compulsory educational environment with a focus on communicative competencies	What specific educational skills remain relevant in the context where Generative Artificial Intelligence (GenAI) is already integrated into students' daily toolkits, and what new competencies emerge as essential in this technological landscape?	Qualitative approach: <ul style="list-style-type: none"> <li>• In-depth interviews</li> <li>• Focus Groups</li> </ul>	Randomized sample of educators and teachers, AIEd scholars and students of secondary education of Catalunya	A clear overview of the current situation of AIEd literature, including research trends and a list of core competencies in this new context, cross-checked with qualitative data from students and teachers
Observe and analyze the strategies, motivations and usage made by students with GenAI in order to understand and comprehend the forms of appropriation of this technology	What specific forms of appropriation do students make of GenAI and how can these approaches be effectively integrated into education while aligning with the assessed competencies?	Qualitative approach: <ul style="list-style-type: none"> <li>• In-depth observation of student's interaction with GenAI</li> <li>• Qualitative-based sessions with students</li> </ul>	Randomized sample of students of secondary education in Catalunya.	A list of strategies, usage patterns and motivations of students when interacting with GenAI given certain tasks. Interaction flows as shown in <i>Figure 1</i> (p.14)
Co-create and produce material that gather all the knowledge of the project and act as reference guides in developing the identified competencies, in addition to promoting the responsible and ethical use of GenAI in education.	How can the co-creation and production of educational and support materials contribute to the development of the newly identified competencies and communicative skills in students?	Participant approach: <ul style="list-style-type: none"> <li>• Experimental participatory methodologies</li> <li>• Co-creation and design workshops</li> </ul>	As far as possible, the sample selected from the previous objective is maintained in order to give continuity to the project.	It is expected to produce a white paper to provide guidelines for the responsible and ethical use of AI and a fictional work that brings together all that was produced in the participatory co-creation sessions. To increase the knowledge transfer of the project, informative talks will be encouraged to promote both materials.

*Table 1: Summary of research questions, objectives, planned methodologies, sample, and expected results. Own elaboration.*



## **6. Connection with the Department of Communication**

The research purposes of this study are well aligned with the current research and academic interests of Dr. Frederic Guerrero-Solé in relation to AI-mediated communication and its impact on society. That is why Dr. Frederic Guerrero-Solé is proposed as thesis director, and close collaboration with him is expected during the Ph.D., in order to publish different studies related to the central topic of the thesis and to peripheral topics such as the reception and impact of GenAI in different collectives of society. This collaboration can take the form of papers such as the one to be presented at the IAMCR2023 in Lyon under the title “*Art or Theft? Analysis of the Networks of Euphoria and Desperation around Generative AI in Twitter*” which has been co-written by Dr. Guerrero-Solé and oneself.

Moreover, this thesis pretends to be included in the MEDIUM research group for several reasons. Firstly, this thesis is aligned with the objectives and purposes of this research group about the exploration and analysis of the evolution of the media ecosystem and the changes in the processes of technological mediation. It is also connected to the interest related to the impact of new media in the media environment and the uses that this type of media can have. Artificial intelligence is a prominent ecosystem modifier with the potential to rewrite the workings of the media industry and people's relationships with technology, especially in the education sector.

In addition, this thesis can benefit significantly from the work of some MEDIUM scholars, such as Dr. Carlos A. Scolari and his research on media ecology, media evolution, and new media languages, or Dr. Mar Guerrero Pico and her research on reception effects and participatory methodologies. In fact, the possibility of a co-direction with Dr. Guerrero Pico is envisaged, since her supervision can provide knowledge and formation of great value for the thesis to be consolidated and also favor the transfer of knowledge and the applicability of this project in society. In this sense, close collaboration with Dr. Guerrero Pico is foreseen in the writing of articles, especially those corresponding to the second phase of the project.

This project can also gather the most outstanding conclusions and insights from previous department projects such as *Transmedia Literacy* by Scolari et al. (2018) or PLATCOM, and even broaden the horizons of media literacy proposed there. On a methodological level, the

specialization of this research group in qualitative methodologies can be very useful. Finally, the group's experience in the collaborative elaboration of projects between analyzed subjects and researchers is a clear reference for the cooperative part of this thesis.

In conclusion, MEDIUM offers the perfect conditions for the development of this thesis, since it fits with its conception of media ecology as an evolving and changing ecosystem, with direct impacts on society. In addition, the group's specialization in participatory methodologies can be very useful to produce a genuine and useful product for the propositional part of the thesis.

## **7. Timeline of execution of the project**

As already highlighted in the document, the AI context is very fast-paced and it is important to consider this when designing research proposals in the medium term. This thesis is designed to release articles in different phases in order to make contributions to the field of study and at the same time generate a solid and valuable project at the end of the thesis. The acceleration of the context makes the 3-year duration perfect, as it allows a balance between a relatively fast reaction and solid results based on deep research. The following is an approximate timeline of what is expected to be achieved in these 3 years of the program

### **Phase 1: Analysis and Identification of Competencies (Year 1)**

- Comprehensive literature review on the integration of GenAI in education and its impact on communicative competencies looking for research trends and theoretical foundations of AIED.
- Identify and classify, among the existing literature, the emerging competencies required in AI-mediated environments.
- Qualitative data collection through interviews and focus groups with educators, scholars in AIED, and secondary school students.
- Thematic analysis of qualitative data to identify recurring topics and gain insights into students' perspectives and experiences, contrasting them with the concepts extracted from the literature review.
- Publish a paper summarizing the findings from the literature review and the qualitative analysis. This first paper may be published in the special issue of the Journal of Technical Writing and Communication “*Professional and Pedagogical Approaches to Generative AI*” since the call for papers is open and the publication phase of the issue is expected to conclude by April 2024.

### **Phase 2: GenAI appropriation and students' approaches (Year 2)**

- Carry on qualitative-based participant sessions of interaction guided by given tasks with secondary school students.
- Conduct in-depth observations of students' interactions with GenAI technologies in educational settings.
- Analyze qualitative insights to understand how students appropriate GenAI and explore the frictions and barriers they may have encountered.

- Research for alternative uses and hacking behaviors among students to assess their critical thinking and creativity in relation to GenAI.
- Publish one or more papers presenting the findings from the observations and analysis of student approaches to GenAI.

### Phase 3: Co-Creation and Production Stage (Year 3)

- Summarize the results from the previous phases to develop a comprehensive framework for integrating GenAI into education and promoting responsible and ethical use.
- Collaborate with students and teachers to co-create educational resources, including responsible use guides, workshops, and talks.
- Creation of fictional works that encourage critical reflection on the ethical implications of GenAI through multimodal and transmedia formats.
- Refine the produced materials through iterative feedback and testing with students and teachers.
- Publish the papers showcasing the developed support material and discussing its potential impact on the integration of GenAI in education.
- Gather all the papers of the project and give unity to the thesis in order to defend it in the tribunal.

On the following page, Table 2 summarizes the project timeline.

Ph.D. Project Timeline	YEAR 1 (2023-2024)												YEAR 2 (2024-2025)												YEAR 3 (2025-2026)																						
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AGO	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AGO	SEP											
<b>Phase 1</b>																																															
Literature Review	█																																														
Qualitative Data Collection: Interviews	█		█																																												
Qualitative Data Collection: Focus Group	█		█		█																																										
Thematic analysis of qualitative data	█		█		█																																										
<b>First Theoretical Paper: CFP Professional and Pedagogical Approaches to GenAI - JWTC Issue</b>																																															
Writing	█																																														
Full Paper Submission	█																																														
Notification of Full Paper Acceptance	█																																														
Publication of the Special Issue	█		█																																												
<b>Second Paper: New competencies for AIEd Information and Learning Sciences Journal</b>																																															
Writing	█			█		█		█		█																																					
Full Paper Submission	█																																														
Publication	█																																														
<b>Phase 2</b>																																															
Qualitative-based participant sessions and observations																																															
Analysis of qualitative insights and frictions/barriers exploration																																															
Research for alternative uses and hacking behaviors in AIEd																																															
<b>Paper: Student's approaches to GenAI, co-written with Dra. Mar Guerrero-Pico</b>																																															
Writing																																															
Full Paper Submission																																															
Publication																																															
<b>Phase 3</b>																																															
Summarizing results and framework development																																															
Beginning of workshops with students																																															
Co-creation of educational resources and visuals																																															
Refinement of materials and iterative feedback																																															
<b>Paper: Case Study: Participant approach in the co-creation of educational material to integrate AI in Secondary School Education</b>																																															
Writing																																															
Full Paper Submission																																															
Publication																																															
<b>Ph.D. Thesis</b>																																															
Final thesis editing																																															
Thesis presentation preparation																																															
Thesis Defense in the tribunal																																															

Table 2: Approximate Gantt Chart of the Thesis. Own elaboration.  
 Note that the deadlines for paper publication in phases 2 and 3 are orientative.

## **8. Limitations and ethical guidelines**

This project acknowledges certain limitations that may impact its scope and applicability. The limitation to visual GenAI models, although they are quite representative of the current generative landscape, may limit the conclusions to be drawn and condition in a certain way the experimental phase of the project. Furthermore, while the age limitation allows for an in-depth exploration of educational skills within the secondary school context, the findings may not be directly applicable to other educational levels or age groups. This demands a separate investigation to address their perspectives adequately, as different ages may entail different uses of GenAI, different strategies and motivations, and different skill needs.

There are also some methodological limitations. Although a mixed-methodology approach provides valuable insights, practical constraints may restrict the sample size, duration of data collection, and the scope of methods employed. The sampling strategy used or the resource availability may also affect or limit the results. Another important limitation of this study is the uncertainty in the evolution of GenAI systems in the future and the direction that both the private and public sectors will take. In this sense, the evolution of the public sector may also affect the legal framework for the use of AI in education, new regulations and supranational laws may affect the development or applicability of a project such as the one presented.

Ethical responsibilities are a top priority in this project. One of the main considerations in this sense is the participants' data protection and privacy, especially students. To ensure compliance with regulations, strict measures will be followed, including informed consent, data anonymization, and the secure storage of all the project's data. All UPF ethical processes and standards for research of this kind will be followed strictly to avoid any ethical conflicts. The project will also avoid at all costs the possibility of participants receiving any emotional or moral harm as a result of their interaction with the AI, and they will be informed of all risks involved. Support mechanisms will be set to address any concerns or discomfort experienced by participants who also will be able to withdraw from the project at any time.

Finally, the project will emphasize the responsible use of GenAI in education, raising awareness about the ethical implications and promoting safe, inclusive, and critically informed utilization of these technologies. The project will underscore the importance of

human oversight, critical thinking, and adherence to ethical guidelines in the integration of GenAI in educational contexts. By recognizing these limitations and vindicating the ethical responsibilities, the project aims to contribute to comprehensive and trustworthy research that respects the rights and well-being of participants and advocates for responsible and ethical practices when using Generative Artificial Intelligence in education.

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