Exploring the experiences of the students of Environmental Communication and Management regarding Artificial Intelligence

An Interpretative Phenomenological Analysis

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Abstract

Artificial intelligence has undeniably revolutionised the education system in recent years. The students of Environmental Communication and Management (ECM) at the Swedish University of Agricultural Sciences (SLU) are also witnessing this widespread prevalence of artificial intelligence (AI) in their academic and professional lives. The multifaceted application of Artificial Intelligence in the education system has created concerns about academic integrity and resulted in challenging situations in the learning environment. The ECM programme students with diverse academic backgrounds and nationalities anticipated unique experiences regarding the implementation and applicability of AI. This study explored the contribution of AI to the learning environment and professional contexts of former ECM students. The study has been conducted by employing the theoretical and methodological underpinnings of Interpretative Phenomenological Analysis (IPA). The diverse and unique experiences of the study participants have been analysed and interpreted through this philosophical approach. Three Group Experiential Themes (GETs) emerged from the interview analysis, and every group theme consisted of three distinct Personal Experiential Themes (PETs). It emphasised the importance of prior knowledge and conventional learning methods for knowledge construction and developing a comprehensive understanding of Environmental Communication (EC) contexts instead of relying solely on AI. They prioritised the limited application of AI in the academic environment and concentrated on critical thinking and careful consideration before integrating it to accomplish academic tasks and assignments. However, they acknowledged the emergence of AI in their professional spheres and anticipated its unavoidable presence in all aspects of life. The diverse experiences and viewpoints of the former students may add value to the ECM programme concerning the future application of AI in collaborative learning. Thus, the findings of this study provide the students' perspectives regarding the ethical implementation of AI, which may contribute to enhancing the learning experiences of the new ECM students and highlight the prospects and challenges for EC practitioners in the presence of this advanced technological feature.

Keywords: Artificial Intelligence, Environmental communication, Experience, Knowledge construction, Emotion, IPA, Academic Ethics.

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Abbreviations

AI	Artificial Intelligence
EC	Environmental Communication
ECM	Environmental Communication and Management
ET	Experiential Theme
GET	Group Experiential Theme
IPA	Interpretative Phenomenological Analysis
LLM	Large Language Model
PET	Personal Experiential Theme
SAC	Student-AI Collaboration
SLU	Swedish University of Agricultural Sciences

1. Introduction

In recent years, the emergence and application of Artificial Intelligence (AI) have profoundly transformed the education system and learning process. The current students of the Environmental Communication and Management (ECM) programme at the Swedish University of Agricultural Sciences (SLU) are also experiencing the proliferation of artificial intelligence in academia, where rapid technological advancements concerning AI drastically influence the current education system and learning outcomes. The enrolled students in this programme actively engage with teachers and other students and participate in field studies and course activities. According to the Sverige Lantbruksuniversitet (SLU) website, the programme information of *Environmental Communication and Management* (n.d.) highlighted the significant feature of this programme is the diversity of the enrolled students from different nationalities, backgrounds, and languages. Through an interactive learning environment, students learn about different perspectives, engage in discussions concerning environmental communication (EC), and construct their knowledge. Hence, students from various academic backgrounds are accepted into the programme, representing several nationalities, including Sweden; here, they get an opportunity to discuss their experiences and perspectives and articulate their views through academic tasks and assignments.

Recently, there has been much discussion on accomplishing academic tasks with AI-written texts by the students of SLU. Regarding this matter, the SLU (2024) Website acknowledged that AI is expanding rapidly and influencing higher education and is poised to become an integral part of our daily lives, with numerous possibilities and challenges. Artificial Intelligence intends to enable computers to perform tasks often associated with human minds, with inescapable presence (Boden 2018). Moreover, George (2023) claimed that the innovative features of AI (ChatGPT, Google Bard, Midjourney, and Canva) are revolutionising industries and transforming how we work, learn, and communicate since it can communicate and converse with users and transmit relevant insights and concepts based on human queries. Therefore, the emergence of AI into academia is initiating extremely challenging situations for the learning environment and accomplishing academic tasks with the possibility of breaching academic integrity.

The emergence of artificial intelligence has facilitated the learning system through expedited information processing, logical reasoning, and prompt feedback.

Artificial intelligence is developed with the assemblage of vast quantities of data. Subsequently, this data can be analysed to ascertain information, detect patterns, and initiate insights (Brooks 2022). Moreover, advanced artificial intelligence is based on sophisticated computers and algorithms that pervade every aspect of human enterprise (Gherheș and Obrad 2018). However, the acceptance or rejection of AI-supported information is contingent upon personal preferences and decisions rendered by individuals.

Human experience is unique and interconnected with knowledge and perceptions. Inglis and Thorpe (2012) stated that human knowledge is never 'objective' since everyone interprets reality from their subjective viewpoints. Smith et al. (2022) defined experience as “multifaceted, context-specific, perspectival, and unique”. Thus, the unique and diverse human experiences are associated with distinct perceptions, perspectives and interpretations of the same phenomena within individuals.

EC addresses environment-related concerns and challenging issues that involve several stakeholders, communities, and actors. Here, meaningful conversation, dialogues, and human intervention are emphasised for preserving the environment. In one of the EC approaches, Pezzullo and Cox (2018) mentioned that public participation reflects the commitment to democratic practices that intend to resolve or manage disputes over public goods and resources. Thus, in EC, to understand these controversies and debates related to public resources, the voices of the stakeholders and actors should be included and considered in the decision-making process by ensuring their active participation. Here, the study participants, currently employed as EC practitioners, are confronting the EC concerns in the presence of technological breakthroughs. Therefore, this endeavour will explore and discuss the diverse experiences of former ECM students regarding AI in academia and the professional sphere in the EC context.

1.1 Technological advancements and education

The assistance of AI is currently being utilised extensively in various fields, including education, research, and different workplaces, for generating fresh ideas, insights and feedback. The advent of AI has resulted in a prominent transformation in the educational experiences of ECM students, which are also intensely connected to academic ethics. Meanwhile, the former ECM students are employed as EC practitioners experiencing the implementation of AI in their professional endeavours. Presently, there is extensive discussion, criticism and controversy about AI in the education sector. A recent study about the implementation of AI chatbots in the Swedish education system showed concern regarding copy-pasting AI-generated content, which not only breaches academic integrity but also undermines the literacies and competencies of the students (Cerratto Pargman et al.

2024). The study findings of Gherheș and Obrad (2018) on 'Technical and Humanities Students' on the Development and Sustainability of AI' conducted in two universities in Timisoara, Romania, reflected that the students pursuing technical studies were confident about the future ramifications of AI. In contrast, the students of human studies expressed an interest in human values and perceived AI pessimistically; it is evident that these two groups of students from different backgrounds experienced and explained the same phenomena differently according to their perspectives. The review study of Ng et al. (2023) explored the application of AI in education, where they conducted a content analysis of 49 articles published from 2000 to 2020. The authors pointed out the importance of AI literacy for students in equipping them with the abilities and attitudes to thrive in an AI-driven digital world. However, Foltynek et al. (2023) reflected on the implications of AI and mentioned that AI has the potential to compromise academic integrity, but it amplifies the ability of the users. Thus, students and educators should have adequate guidance regarding the merits and demerits of AI for its ethical application in academia. Another study on Student-AI Collaboration (SAC) reflected the students' perspectives on AI, stating that students expect AI to act as a learning mate, a tutor, and an effective tool to accomplish their tasks during SAC (Kim and Cho 2023). Still, students have subjective preferences and choices concerning the application of AI for their academic tasks; however, accepting technological advancements is not independent of social influence and conformity. Because, the presence of social influence impinges on human thought, feelings, behaviour, and conformity, which can influence individuals to attune to certain standards (Kowalski and Westen 2009). Hence, the prevailing discourses and controversies around AI exert significant influence on the perceptions and attitudes of users towards its acceptance and implications.

1.2 Problem formulation

The advent of technological developments and the widespread use of artificially generated information in academia for knowledge construction have resulted in several challenging situations and raised concerns about the ethical use of AI. Current discourses, controversies, criticisms, and diverse perspectives regarding the implementation and adoption of AI contribute to this, which may initiate ambivalence among students. Kim and Cho (2023) anticipated that the presence of anthropocentric perceptions of students towards AI has contributed to this dilemma. Here, Malekos (2023) stated that ChatGPT was made available to the public in late 2022, and it has reignited interest in the field of education. In the study of Lo (2023), the author claimed that AI-written text is capable of detouring traditional plagiarism detection; simultaneously, AI is efficient enough to complete academic tasks instantaneously, which can empower learners with disabilities by providing

adequate learning support and assistance (Kasneci et al. 2023). Hence, the prevalence of AI has initiated a conspicuous change in the academic environment with prospects and challenges.

The ECM programme enrols international students who have studied in different education systems and have unique academic experiences. Hence, it is crucial to carefully explore the students' perspectives regarding the contribution of AI in the EC context. Because every student learns independently and may require additional learning support besides the traditional study system for a nuanced understanding of the subject matter. Thorburn and Stolz (2022) also mentioned that students engage with their environment differently; thus, their subjective experiences vary in the academic environment. Furthermore, since the participants are also working as EC practitioners within the era of technological sophistication, their experiences and viewpoints on AI in their workspaces should be addressed to understand the scope and relevance of AI in real-world EC challenges.

1.3 Aims and Research Question of the Study

The study aims to explore the opportunities, challenges, and ethical uses associated with AI in academia and will illustrate the role of AI in resolving real-world challenges related to EC.

Research Question

i) How do the ECM students explicate their experiences concerning the application of AI to the ECM programme and working as EC practitioners?

Sub-Questions

- How do they perceive the opportunities and challenges related to the assistance of AI in their knowledge construction, academic tasks, and solving real-world environmental issues?
- What are their perception and ethical considerations regarding the emergence and application of AI as EC graduates and practitioners?

1.4 Significance of the study

This study intends to investigate how ECM students' experience of the emergence of AI contributes to their knowledge construction and comprehensive understanding of academic trajectories and workplaces. The Work Package 3 (WP3) of *MISTRA Environmental Communication, 2024-2027* (n.d.), reflects on critical engagement with science and technology, connecting knowledge

construction, emotion, and values in EC. Based on this assumption, this thesis will illustrate the experiences of former ECM students regarding the contribution of AI in knowledge construction, as well as their emotional and ethical stances regarding this in academia and their professional pursuits.

The study participants, in addition to their role as ECM students, are also currently employed as EC practitioners; hence, by exploring their experiences and viewpoints in dealing with complex real-world environmental challenges, the study will contribute to the implication of AI in EC aspects. This study will offer new perspectives for the ECM programme since it will exemplify the students' reasoning behind the implications of AI for knowledge construction and meaning-making associated with EC coursework, research and professional lives. Additionally, Kim (2023) highlighted the role of the teachers and said that AI facilitates data-driven tasks, and teachers are adapting to this technological support in the learning environment; thereby, fostering teachers is essential to developing the necessary skills regarding AI in the learning environment. The insights from the former students will also address the prospects and challenges concerning the ethical application of AI pertinent to EC, both in academia and the professional world. Therefore, the findings of this study may help the ECM teacher team to understand the viewpoints of the students and aid in designing academic tasks and ethical guidelines concerning the application of AI for future ECM students by considering the alumni's experiences and perceptions.

2. Interpretative Phenomenological Analysis (IPA)

The theoretical approaches of Interpretative Phenomenological Analysis (IPA) have been employed to conduct the study to understand the experiences of the ECM students regarding AI assistance and their application for accomplishing their academic and professional tasks. The IPA approach integrates phenomenology, hermeneutics, and idiographical concepts. The primary concern of IPA is to explicate the individual's experiences of a specific phenomenon (Howitt and Cramer 2008). IPA is a qualitative research approach concentrated on the detailed examination of the lived experiences of individuals (Smith 2011). Hence, IPA has been implemented in this research to critically explore, elucidate, and analyse the experiences of ECM students regarding AI.

The study intends to explore and analyse individuals' diverse experiences, exhibiting the connectedness among their experiences to understand the phenomena. According to Tuffour (2017), IPA research endeavours to comprehend participant viewpoints from within the individuals themselves and analyse data inductively to discover how people interpret their experiences. The IPA study of Cooper et al. (2015) on students' learning experiences mentioned that students relate their learning experiences not only to their previous education but also to personal experiences that aid them in interpreting and comprehending their learning experiences. Hence, to explicate students' learning journeys, it is imperative to understand their personal experiences regarding the phenomena. In this study, participants discussed their individual experiences regarding AI as ECM graduates and EC professionals.

The phenomenological focus will discuss how individuals perceive, observe, and comprehend their experiences by interacting with objects and situations, including their actions (Inglis and Thorpe 2012). Hermeneutical approaches have been employed to interpret and make sense of the phenomena (Smith et al. 2022). Idiographic methods include an in-depth analysis of a phenomenon at the individual level for new insights (MacLeod 2019) and the pledge to study individual cases thoroughly in a corpus (Smith 2011).

2.1 The assimilation of phenomenology, hermeneutics and ideography

The core concern of IPA is to explain and interpret the phenomena experienced by the individuals. Langdridge (2007) illustrated that the key emphasis of IPA studies is to examine how individuals interpret and understand their experiences, specifically exploring the significance of these experiences in their lifeworld. According to Alase (2017), the IPA approach concentrates on interpreting and amplifying the lived experiences of the research participants; here, the researcher is required to have a profound understanding of the participants' lived experiences. Thus, in IPA, the phenomenological researchers focus on the ideographic details of individuals' lived experiences and attempt to establish the connection between the readers and these individual experiences (Emery and Anderman 2020). Moreover, qualitative approaches like IPA intend to provide a coherent explanation that appears from the participants' statements (Pringle et al. 2011).

According to Deetz (1977), phenomenology concentrates on exploring underlying conscious structures of comprehension. It studies the conscious experiences of humans from a first-person point of view to reveal the inherent structure of the experiences relevant to reality. Hawes (1977) mentioned that phenomenology is a self-reflective critical approach that explores preexisting assumptions. Here, the study participants were enrolled in different academic sessions of the ECM programme; their viewpoints on AI may vary due to the evolving nature of AI during these different years, and meanwhile, they are employed as EC professionals. The phenomenological approach allows individuals to elucidate their experiences and preferences regarding education and profession, enabling them to explore the transformations in their perspectives on the proliferation of AI. Kings and Ilbery (2015) said the phenomenological approach provides the opportunity to uncover the true essence of individual experiences, highlights the subjective preferences of humans and accentuates comprehending the diverse viewpoints of the phenomena.

VanScoy and Evenstad (2015) stated that an individual's perception of the object's reality depends entirely on what they have personally experienced. This approach can be employed to understand how ECM students have personally experienced AI across their academic and professional pursuits. The diversity of students' perspectives provides opportunities to explore different experiences and perceptions they have incorporated into their learning process (Thorburn and Stolz 2022).

The second key concept of the study is hermeneutics, which aims to explore how the participants share, explain and interpret their experiences. Smith (2011) explained that acquiring individual experience is not an easy endeavour; it necessitates the researcher's involvement and interpretation, which aligns IPA with a hermeneutic perspective. Since the function of hermeneutics is to interpret, IPA employs a two-stage interpretation process in which the researcher endeavours to explicate how the participants interpret the phenomena from their experience (Pringle et al. 2011). Through this, the researcher analyses the interpretation of the experiences of the study participants and explains and again interprets their diverse viewpoints. Therefore, an IPA researcher practices *'double hermeneutic',* meaning that the researcher interprets the participants' sense-making (Tuffour 2017). However, the researcher has to be aware of the personal biases and pre-conceptions and, therefore, bracket themselves while interpreting the study findings (Smith et al. 2022).

The third IPA approach is ideography, where researchers diligently adhere to this idiographic technique throughout the analytical process to complete the assessment and identify the similarities and differences in the participants' experiences (Tuffour 2017). The ideographic approach focuses on the participants' perceptions, nuances and understanding relevant to their experiences; here, Thorburn and Stolz (2022) asserted that humans have an inherent ability and intuitiveness to make sense of phenomena from their first-hand subjective viewpoints. Smith (2016) stated that one of the aspects of IPA involves exploring personal experiences on a case-by-case basis and articulating both commonalities and differences within the study sample. Moreover, IPA studies are known as inductive, grounded in collected data with interpretative engagement and invariably ideographic (Langdridge 2007). Therefore, the methodology concentrates on specific details over general ideas but subsequently conducts a cross-analysis to identify common themes across the cases (Rajasinghe 2020). So, by employing the cross-case analysis approach, the participants' unique lived experiences, perspectives, and contextual meaning-making regarding specific phenomena could be explored at the individual level. Larkin et al. (2019:188) stated that "in multiperspectival IPA designs, the unit of study is the case (e.g., the person, dyad or system)", where each individual was regarded as an individual case and studied at an idiographic level. The ideographic approach of IPA is a systemic procedure that involves identifying the similarities and differences among the cases relevant to the emergent themes. It provides the scope for new understanding and may bring unexpected turns for the researcher (Guihen 2020).

3. Research Design

3.1 Cross-Case Analysis

IPA starts with an in-depth analysis of a single case. Chapman and Smith (2002) stated that IPA studies include a detailed case-by-case analysis of individual transcripts to examine the perceptions and understandings of the specific group rather than making generalised claims about the phenomena. Moreover, it includes all aspects of self-reflection related to the views, perceptions and understanding of the participants (Brocki and Wearden 2006); therefore, this theoretical approach enables the researchers to acknowledge and explain the diverse experiences of the participants within the same study. Smith et al. (2022) explained that in cross-case analysis, each case is considered unique and crucial for understanding the experience. They illustrated that the analytical method begins with thoroughly scrutinising each instance and then carefully identifying the similarities and differences among the cases. Thus, this approach of IPA allows the researcher to develop themes that emerge across the cases and simultaneously aids in maintaining the ideographic focus on individual experience.

3.2 Methodological justification

The enrolled students in the ECM programme have diverse academic backgrounds; hence, their viewpoints on AI may vary due to their individual preferences and concerns regarding it. The rationale behind selecting this methodological approach is to explore the diverse individual user experiences and perceptions of former ECM students regarding AI- assistance in academia and EC professions. Moreover, their different academic sessions and the accessibility and familiarity with this technologically advanced feature contribute to their unique experiences. Malekos (2023) said that AI tools can analyse data about each student's learning style, pace, and preferences to create a personalised learning experience; since everyone learns differently, AI can assist students in acquiring knowledge by personalising the material. Jeong and Othman (2016) suggested that in educational studies, IPA provides valuable methodological guidance to illustrate the personal experiences of

teachers and students. The study of Antony and Ramnath (2023) employed IPA to examine the impact of AI chatbots as a communication medium on student engagement and support in higher education. According to Emery and Anderman (2020), the application of IPA motivates researchers to prioritise the inclusion of the perspectives of marginalised individuals, which may otherwise be excluded from existing literature. Hence, in this study, applying IPA could be useful for addressing ECM students' unnoticed viewpoints and experiences concerning AI.

3.3 Methodological Approach

The methodology of this qualitative study comprises several stages, which are illustrated in figure 1 and discussed accordingly.

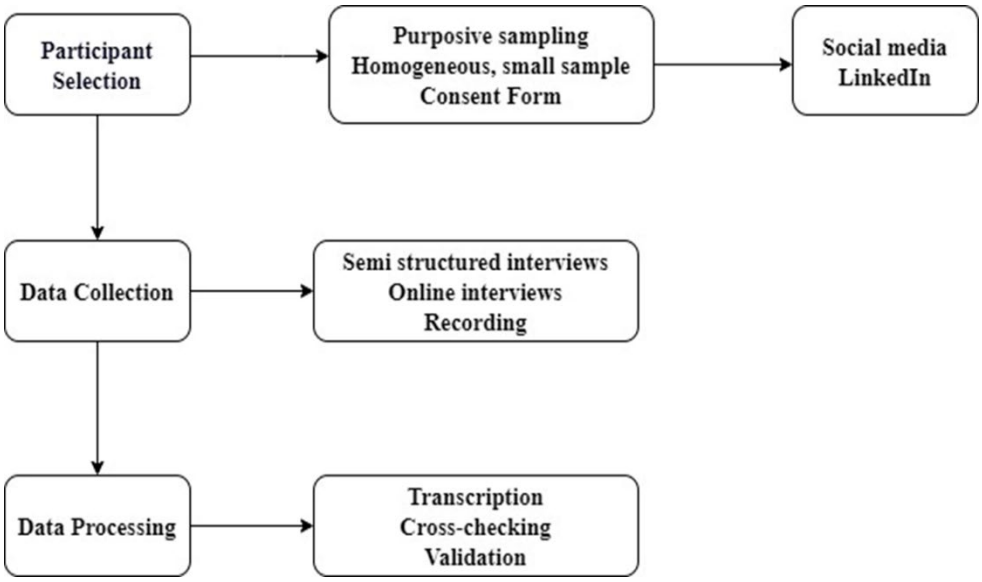

Figure 1 Methodology of the study *Source: Author*

3.3.1 Participant Recruitment

This study's participants are confined to ECM students from different academic sessions. The initial study objective was to conduct the study exclusively with graduates of the ECM programme because of their academic and professional experiences. However, a current student who is enrolled in one of the previous ECM programme sessions but has not yet completed the thesis was also included in this study. The total number of participants for this study was six. Five participants completed their studies in the ECM programme from the 2021 to 2023 academic year, and one of them anticipated completing the thesis in 2024. They are currently working as EC professionals.

3.3.2 Sampling Procedure

The study participants were selected purposively. In the IPA study, the samples are homogeneous and small in number to gain sufficient perspectives on a specific context related to their lifeworlds (Langdridge 2007; VanScoy and Evenstad 2015).

I utilised the social media platform Facebook to identify the study participants from the Worldwide Environmental Communication Alumn Network (WECAN) Facebook and LinkedIn group, which is managed by ECM students and the teacher team. I purposively selected the interviewees from the 2021-2023 academic year from the WECAN by manually screening the Facebook profiles of all group members. However, students who graduated before 2020 were excluded from the study due to the limited exposure to AI in the academic environment at that time. After the selection process, I contacted the students through Facebook Messenger and asked them for an interview with a brief introduction of me and the thesis topic. Eight students responded to my query, and three of them agreed to the interview. The remaining students were unwilling to partake in the study due to their unfamiliarity with AI when they were students. Finally, three participants were confirmed through LinkedIn networking, and three were from the Facebook EC group.

Before communicating with the students, I consulted with the teacher team. After their formal approval, the ECM students were contacted for interviews. Table 1 illustrates the final list of the participants with the communication networks. Interview dates and times were decided based on the participants' flexibility and availability. Before scheduling the interview dates, a consent form was sent to each participant. They sent the signed consent forms before the interviews.

3.3.3 Data collection

The relevant data for this study were obtained through a semi-structured interview. According to Langdridge (2007), the IPA study is designed with semi-structured interviews to collect data and enable participants to articulate their experiences precisely. The semi-structured interviews serve the values of IPA by focusing on the study participants' interpretations of the phenomenon (VanScoy and Evenstad 2015). I prepared an interview guide with relevant questions; however, it is crucial to acknowledge that I have not followed the interview guide thoroughly in every interview. Howitt and Cramer (2008) stated that semi-structured interviews include general questions followed by a specific set of questions, but they need to be flexible, and adjustments may be applicable to the style of questioning. Hence, I meticulously adhered to the natural flow of participants' responses during each interview before asking the subsequent questions. Due to their diverse perspectives, experiences and preferences regarding AI, I tailored the interview questions to the interviewees' firsthand experiences.

The interview dates and additional information are illustrated in table 1.

Table 1 Interview dates and participant information

Participants	Assigned Names	Interview Date	Graduation	Connection: WECAN group	Academic Background
01	Alice	16-02-2024	2023	Facebook	Peace and Development studies
02	Bertha	19-02-2024	2022	LinkedIn	Societal Analysis and Communication
03	Carina	21-02-2024	2022	LinkedIn	International Management (marketing)
04	Diana	24-02-2024	2021	LinkedIn	Journalism (Media Management)
05	Elias	26-02-2024	2022	Facebook	Mass Communication (Public Relations)
06	Freya	01-03-2024	2024**	Facebook	International Journalism, Rural Development and Natural Resource Management

** Participant 06 is a current student in the ECM programme.

Source: Author

The participants resided in several countries and different regions of Sweden, so I conducted separate online interviews on the Zoom platform. Due to the flexible scheduling, online interviews saved time and helped me to reach the study participants easily. The interviews went well without any obstacles. All interviews were conducted in English, and audio was recorded with the participant's consent.

Their original names have been changed for this study; hence, they will be addressed with these assigned names in the result discussion section.

3.3.4 Interview transcription and cross-checking

At first, interview audios were transcribed using Microsoft Office 365 software and transformed into Word documents, serving as the primary qualitative data for this study. Then, in the following stage, I diligently cross-checked the software-transcribed data with the recorded audio files for every participant to rectify the errors and inconsistencies. While recording the interviews, some words tended to be unclear because of the differences in the pronunciations. I highlighted those ambiguous words/ sections and sent the transcription to the participants to cross-check their responses and alleviate the errors. Before commencing the detailed analysis, I followed the validity strategies mentioned in Creswell and Creswell (2023)**;** here, the authors mentioned that in order to maintain transparency in the study, the researcher should check the transcripts with the participants for accuracy.

Thus, I emailed them the draft copy (in MS Word format) of the transcribed audio file and requested participants to reflect and review their interview responses and make necessary revisions to highlighted statements or words. I also mentioned that if they wanted to modify any statement/s related to their responses to transcribed interviews, they could add that or ask to remove any confidential statement/s they were unwilling to share in the result section. In their consent form, I added that I would analyse the interview responses after their final approval of the transcribed documents to avoid misunderstandings and exclude confidential information. Another additional purpose of implementing this phase was to provide an opportunity for the participants to reflect on their responses. In this instance, three participants replied that the transcribed interview statements could be used for final analyses without any alteration. The remaining participants provided some feedback on their responses, and one of them requested to exclude the name of the country from the data analyses.

3.3.5 Data Analysis Procedure

The analysis of this study was conducted in several stages. These stages are illustrated in figure 2.

The first stage includes the initial involvement with the data for familiarity by reading, re-reading and cross-checking with the audio files.

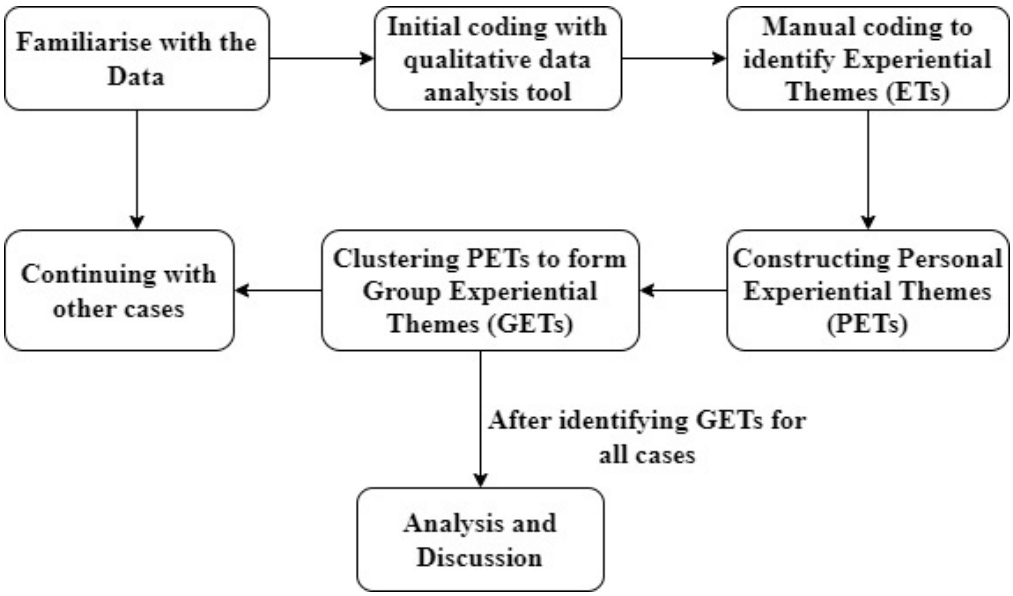

Figure 2 Data analysis procedure *Source: Author*

Then, I implemented the coding process to extract pertinent information and keywords from the interview transcriptions. I have employed Microsoft Word and the Tagutte qualitative data analysis tool (*Taguette* 2021) to highlight and identify initial codes and prominent keywords from the interviews separately. Figure 3

shows an example of the interface of this data analysis tool from one of the interviews.

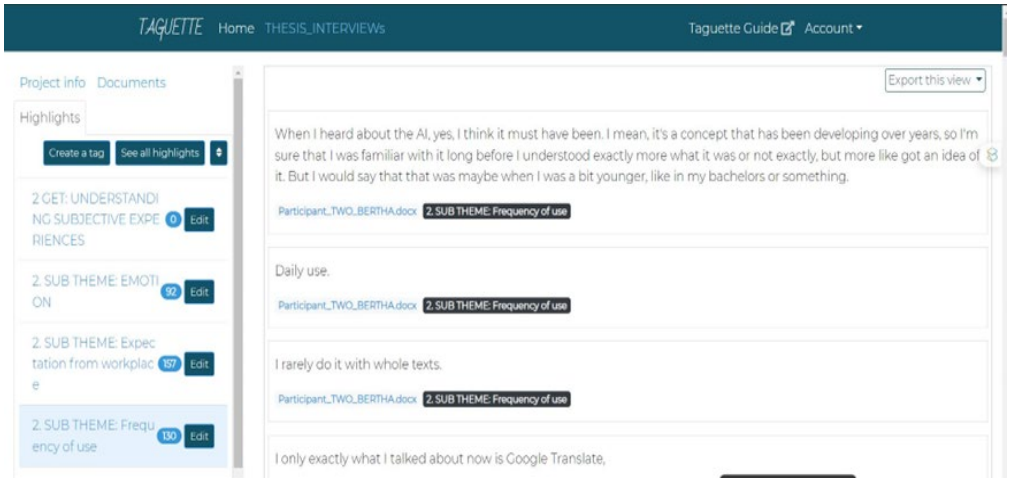

Figure 3 Interface of qualitative data analysis tool *Source: Taguette*

I have employed the line-by-line IPA technique in every case suggested by Smith et al. (2022) to find the initial codes emerging from the interviews. After that, for manual coding, I utilised the Tauguette codebook, which is supported in MS Excel and contains all relevant statements from the interviews. The manual coding was performed to identify this study's experiential themes and overlapping ideas in the statements.

In the consequent stage, I organised all relevant experiential themes (ETs) to construct the Personal Experiential Themes (PETs) for each case. Starr and Smith (2023:383) stated that "Interpretative Phenomenological Analysis (IPA) was used to explore the idiographic detail of the resulting interviews. Personal Experiential Themes (PETs) were developed independently for each participant, and these individual cases were subsequently compared to form a structure of Group Experiential Themes (GETs)." Thus, in this study, after coding and sorting relevant statements separately from six cases, the PETs are clustered to develop Group Experiential Themes (GETs). Nine PETs emerged from the interviews, which were clustered into three different GETs according to their relevance. Figure 4 illuminates the construction of PETs and GETs for six case studies.

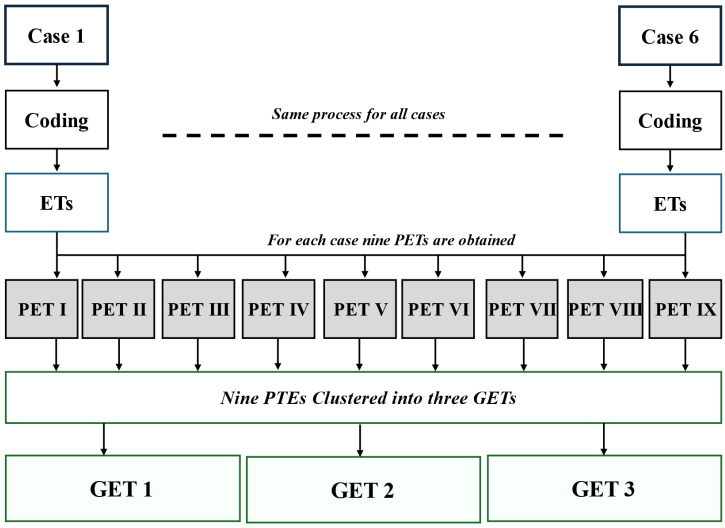

Figure 4 Construction of GET and PET for six case studies *Source: Author*

Each GET comprised three PETs that emerged from the participants' statements. These themes have been analysed and discussed with the pertinent statements aligned with the research objectives of this study.

3.3.6 Limitations of the study

Several challenging situations emerged while conducting this study. One of the initial obstacles I encountered was establishing communication with the ECM students. I have experienced delayed responses from the participants, and there have been significant waiting times. Moreover, I frequently received negative responses after a prolonged waiting time. The lack of communication resulted in a distressing and frustrating situation. Furthermore, I dedicated an enormous amount of time to social networking sites to connect with potential interview participants; nonetheless, that was a tiresome approach and unproductive most of the time.

Another constraint I would like to mention is the language barrier. Since English is my second language, during the interview, I sometimes struggled to articulate, explain, and clarify the participants' inquiries and faced difficulties in asking follow-up questions based on their responses.

The final limitation of this study is the positionality of the researcher. Holmes (2020) stated that self-reflection and a reflexive approach are essential requirements for researchers to identify, construct, critique, and explain their positionality. Reflecting on my positionality, it was relatively challenging to bracket my thoughts while explaining the interview questions and simultaneously dealing with my biases as a current student of the ECM. In the IPA study, the researcher seeks to attain an "insider perspective" to explicate the participants' lived experiences (Noon 2018).

Thus, as a current student in the ECM programme, I was cautious about my familiarity and experiences with AI while conducting the study.

However, Biggerstaff and Thompson (2008) argued that IPA recognises the need for interpretation, and bracketing is controversial in this approach. Emery and Anderman (2020:4) said about bracketing researchers' own experiences, “often referred to as *epoché* (according to Husserl), or suspension of judgement, the goals of bracketing are to first clearly outline, and then to set aside, prior knowledge, biases, and assumptions that researchers hold.” Therefore, bracketing and mitigating the researcher's preconceptions while interpreting the findings with objective viewpoints seemed challenging; nonetheless, I attempted to explicate the findings by being aware of my positionality while interpreting the results with an objective point of view.

4. Results and Discussion

4.1 The connection among the Experiential Themes

The experiential themes emerged from the statements of the study participants, which were assimilated to construct PETs, and the cluster of PETs resulted in GETs (figure 5).

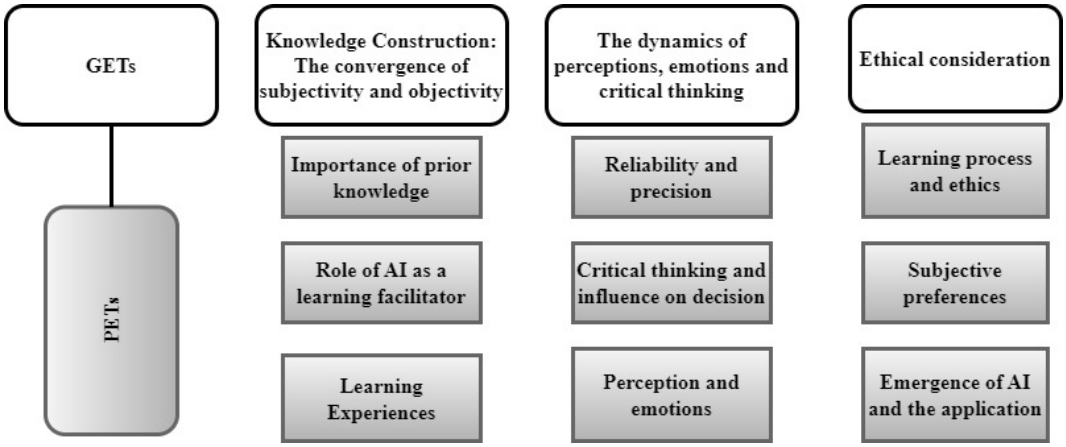

Figure 5 Group Experiential Themes and Personal Experiential Themes *Source: Author*

The first Group Experiential Theme (GET) of this study is 1) Knowledge Construction: The Convergence of Subjectivity and Objectivity, which represents the importance of prior knowledge and understanding in knowledge construction and for developing a comprehensive understanding of certain topics, such as EC theories. At the same time, this theme drew a line with the lived experiences of the participants in the field of knowledge construction with the aid of AI. The three Personal Experiential Themes (PETs) associated with this group theme are i) The importance of prior knowledge, ii) Role of AI as a learning facilitator and iii) Learning experiences.

The second GET is 2) The dynamic of perception, emotions and critical thinking. The participants' previous and current experiences related to their personal preferences, perceptions, and emotional engagement driven by AI have been

discussed under this theme. Here, three PETs covered iv) Reliability and precision, v) Critical thinking and influence on decision and vi) Perception and emotions.

The third and final group theme is 3) Ethical consideration, which discusses the participants' moral considerations, ethics and changes in values when dealing with AI as a student and EC practitioner. This theme allowed participants to reflect on their values and ethical considerations in the context of AI assistance. To explore the influence of AI on their values, decisions and moral judgement, these PETs focused on vii) Learning process and ethics, viii) Subjective preferences and ix) Emergence of AI and the application.

4.2 GROUP EXPERIENTIAL THEMES

4.2.1 Knowledge Construction: The Convergence of Subjectivity and Objectivity

The participants have illuminated some crucial aspects of knowledge construction. Their insights illustrated the importance of prior knowledge for developing a comprehensive understanding of EC. They shared their experiences by highlighting the importance of pre-existing knowledge; thus, their subjective preferences, viewpoints, and prior understanding were considered in this GET. Moreover, how they employed the support of AI in their learning process, along with traditional study systems, has been discussed under these PETs.

i) Importance of prior knowledge

The initial personal experiential theme revolved around the existing knowledge and subjective preferences of the participants. They prioritised the importance of prior understanding of certain topics for thoughtful evaluation of artificially generated feedback. Despite the recent trend of adopting AI-supported tools for knowledge and information, the role of prior knowledge is undeniable, as it supports the users in understanding new knowledge and allows meaningful engagement.

Alice and Bertha shared their perspectives on that;

Alice: "If you have prior knowledge about the topic, then the feedback you get is very contradictory, and you have to reflect and think about it. Where does my free knowledge come from, and where does the knowledge these tools give me come from."

Bertha: "I think prior knowledge is very, very, very important. Because then, you can see yourself where you have a different stance on something that is being said in the text."

Here, Alice and Bertha accentuated the importance of prior knowledge in enhancing a comprehensive understanding of specific topics aligned with the user's primary understanding. Alice highlighted the occasional inconsistency of artificially generated feedback. From her standpoint, artificially generated texts' effectiveness in constructing knowledge relies on the subjective understanding of

the users and analytical skills based on expertise and familiarity with the topic. She also pointed out the importance of different reliable sources and critical reflection on machine-written responses before considering that in the pursuit of knowledge.

Berthas' statements also resonated with Alice. She also stressed evaluating AI-generated responses based on the learners' previous background knowledge and familiarity with the topic. It is essential to recognise the influence of machine-generated ideas on the user's rational reasoning.

Another respondent, Carina, acknowledged the importance of prior knowledge and stated,

Carina: "I have the knowledge for my work, and after spending a lot of time on the topic, I feel familiar with it. Then, when I read it, I realised that things were missing. It is very generic again and gives ideas, but it cannot be used as it is."

According to her, the artificially created feedback is inadequate and packed with information gaps. To justify her claim on artificially generated feedback, she inferred that she could recognise the loopholes of AI-supported responses based on her familiarity with the topic and expertise relevant to this field or issue. She also pointed out that artificially generated texts are written considering broader concepts and seem generic. Thus, the diverse ideas from the machine-generated text can not be utilised without thoughtful consideration.

Elias also stressed the necessity of prior knowledge while employing assistance from AI to enhance the learning experience,

Elias: "I would say it is important because you have prior knowledge that creates a framework, at least for how you see how you understand that concept. How do we understand that tool you want to use, so you go in already with certain information or perception of what that tool can provide or the advantages of that tool."

He acknowledged the importance of prior knowledge and described it as a fundamental structure for acquiring knowledge about certain topics. He also endorsed a positive view of AI-assisted tools and their implications for creating subjective understanding and contributing to knowledge construction. In this regard, he emphasised that users' background understanding is crucial while utilising AI-supported tools for comprehensive understanding, which could be beneficial for accelerating the learning process.

According to Freya,

Freya: "If you do not have prior knowledge of environmental studies, it is probably going to come out with something, for example, 'The lands are being destroyed, there is air pollution,' all of these things. But then maybe if you are not studying the environment, you do not know that you should also be considering that 'the environment' takes more into account than physical landscapes. Environmental studies also consider how people interact with the environment. So, you are probably missing a lot of data and information if you do not know how to ask the next question […] So I think you can not go so far without prior knowledge if you are using AI."

She highlighted her point by mentioning an example based on environmental studies for two different users who have different understandings regarding the concept of environment. At this point, there is a high possibility that machines will generate compromised feedback that is incapable of satisfying users' queries and conversely capable of influencing them. In order to critically evaluate the machine-generated responses, it is necessary to have subject-specific prior knowledge. In addition, by focusing on the limitations of AI-supported texts, the absence of prior knowledge may hinder the learning process and result in superficial understanding. Moreover, when employing these tools, it is crucial to formulate appropriate follow-up questions to develop an in-depth understanding. Her assertion could be applicable to the EC aspects, relevant to environmental-related information and issues, where the misinformation or compromised information may aid in creating misunderstandings.

ii) Role of AI as a learning facilitator

At present, various AI-supported tools are available to aid learning systems and information processing. These tools have been considered both negative and positive over traditional learning approaches. In this regard, Bertha stated,

Bertha: "As a student, when you start to create your knowledge, it (AI) is not something that I believe in. It is something that you can use maybe more as a senior, and it also comes with efficiency there. It has different purposes, and you can use it to be efficient."

She pointed out the importance of using AI-assisted tools at the senior level after having a certain level of competence to handle them. She illustrated that it takes time to develop an understanding of certain topics, which can be achieved through human-centric knowledge provided by the traditional education system. Moreover, at the senior level, students gradually develop existing knowledge and have enough experience to engage with these tools more effectively, and they may consider them to gain new information and insights. Eventually, they build the capacity to handle these tools with a sense of responsibility. The senior students can differentiate between the information sources based on their understanding of relevant topics; from her viewpoint, it is relatively challenging for novice students to deal with the credibility of AI-generated responses.

Carina expressed her views on the learning support provided by AI-assisted tools;

Carina: "I think that is important because EC is also about understanding things or processes of communication, and you have to experience communication […] AI does not know communication. You programmed it to communicate, so it knows a bit about communication, but AI can tell you little things. For example, indirect communication, direct communication, body language, etcetera, are things that AI cannot give."

She acknowledged that AI tools can be used as learning support; conversely, she pointed out their limitations in the discipline of EC. AI-facilitated tools are trained with limited data sets. So, the feedback lacks adequate information and human-

centric approaches regarding communication, which denotes its' limited implications for understanding different communication concepts pertinent to the ECM programme. She believes that, rather than depending on AI facilities, it is essential for EC researchers to engage in active communication and engagement through conventional learning systems and research approaches to enrich their learning experiences.

Diana shared her thoughts on information sources;

Diana: "I quickly understood that it is not a reliable source of information. It depends on the task you give; again, it was cherry-picking of information."

She remarked that the sources of artificially generated feedback lack credibility. She believed this artificially generated feedback contained purposively selected information and might exclude different perspectives. Her perspective is relevant to the context of EC, such as information transmission. Due to the presence of selective information and facts in AI-generated feedback, it must be cross-checked with several authentic sources to evade misunderstandings. However, it can generate responses based on the user's queries. Her concern denoted that the selective approach of AI-trained tools may hinder learning experiences.

Conversely, the user experience of Elias differed from the previous participants. He appreciated the emergence of AI and stated the benefits of AI tools;

Elias: "You get a lot of knowledge from AI, and it simplifies the accessibility of knowledge. You do not have to search too much to understand what you want. You can only ask for it to search for you, and it arranges that information for you to understand easily. Sometimes, you can even tell it to give you an explanation in a very simple language for you to understand, so it is helpful when you want to understand and learn different concepts and familiarise yourself with the other things that are maybe outside your field of study or profession or whatever."

He mentioned that AI assistance facilitated his learning experiences positively by providing simple clarifications, explanations and interpretations to support his understanding of different topics. It is capable of providing new insights and information. Moreover, AI assistance can quickly assimilate enormous amounts of information and save users time. His statement reflected that if traditional academic support is insufficient for developing a comprehensive understanding, it necessitates additional learning assistance. In this context, applying AI as a study assistance is beneficial for enhancing the learning experience and academic performance of users who need additional support to develop their understanding.

iii) Learning Experiences

This theme delved into the participants' learning experiences regarding AI; here, the outcomes of incorporating AI into the traditional learning system will be discussed elaborately based on the participants' reflections on their experiences. In this regard, Alice pointed out that,

Alice: "I think that experience might get lost if you get a text given to you […] if you get feedback and summaries, you still have to continue the context in your own papers in your own […] AI tools

cannot give you original thought or original source material. So, you still have to think about it, how it fits, how you can use it, and where it comes from."

Alice expressed her concern that integrating AI into writing tasks could diminish the human aspects of the learning experiences and lead to knowledge gaps. She highlighted the drawbacks of machine-generated feedback; thus, she did not consider this as the most effective way of gaining knowledge compared to the source material. She emphasised the significance of upholding the balance between subjective preferences and data-driven insights. The reliance on such external sources for knowledge may compromise the richness of human experience, where individual engagement and contextual understanding play a crucial role in knowledge construction.

Diana asserted her expectations regarding the AI-supported information;

Diana: "I felt frustrated because I was expecting it to give me everything they knew and would get everything from every book and construct my understanding of this history. But still, all the data are here; it provides that. My expectation was not met; however, the response was just cherry-picked facts, which I could do easily by reading some books."

She explicitly expressed her discontent about machine-generated feedback, which was filled with information biases and purposively written facts. So, she pointed out that this feedback was inadequate and constrained to satisfy her queries. Dianas' view reflected the absence of authentic information sources and the trustworthiness of AI tools. Her statement revealed the disparity between user expectations and reality. She anticipated that AI would be competent enough to answer user queries by providing all relevant information, but she asserted that these responses are generated with selective information. She pointed out that this information could have been obtained through the conventional education system, independent of AI assistance.

In this regard, Elias stated,

Elias: "I used the ChatGPT to understand concepts that I was unfamiliar with, or maybe I had a little knowledge about them, or I did not have a deep understanding of them. So, I used the ChatGPT to get more clarification of what I wanted to understand. In some way, it has helped me to understand different concepts and terminologies better than I used to understand them. [...] It gives you examples of where you can go and get even more knowledge on that concept."

Elias described his positive impression of the learning experience with the application of a conversational chatbot; he expressed openness about accepting new technological advancements to improve his performance and develop understanding. It is apparent that his experience varied from previous participants. He appreciated the user-friendly approaches of AI-assisted tools and claimed that the application of these tools would be helpful in explaining unfamiliar topics. He preferred the way AI assistance provided elaborate explanations and interpretations of complex topics with relevant examples that he struggled to grasp. His experience

reflected that the support from AI can make the learning process more accessible and flexible.

Freya emphasised the significance of employing context-specific inquiries to obtain pertinent and precise feedback;

Freya: "With ChatGPT, you have to know how to ask follow-up questions really well. In one of our courses in the Environmental Communication and Management programme, we had an exercise where we just had a conversation with ChatGPT for about 2 hours and looked for different answers. We found that if you are looking for a specific answer that you already know the answer to, it can take a long time to have it; [...] So it is quite worrisome if you think that someone who has less knowledge about what they are asking about and looking for an answer and maybe getting surface-level answers or politically correct answers is something that ChatGPT is doing right now."

She pointed out that obtaining specific information through interaction with the conversational chatbots is time-consuming and contingent upon the user's prior knowledge and understanding. Based on her user experience regarding an academic task in the ECM programme, she believes that ChatGPT's responses and feedback rely on skillfully asking relevant questions. She also mentioned that an experienced user familiar with the topic could distinguish between generic responses and feedback with new knowledge from AI-assisted tools that complement their understanding. However, if the users lack an explicit comprehension of the searched topic, it will be a significant concern for their knowledge construction due to the possibility of relying on misinformation.

4.2.2 The dynamics of perceptions, emotions and critical thinking

This second group theme highlights the participants' subjective preferences, perceptions, and emotions related to the recent emergence of AI. Participants described their experiences focusing on the accuracy and precision of machine-generated responses. They also pointed out the influence of AI-assisted feedback on their decision-making process and their preferences for utilising AI-generated feedback to accomplish their tasks.

iv) Reliability and precision

In this personal experiential theme, Alice made two different but relevant statements,

Alice: " I guess that you are very sure that you get the right information, [...] these tools give people the wrong sources or cite things wrong, and I think that is very dangerous." and *"You cannot say it is not face value and try to get different sources."*

Alice explicitly highlighted the significance of originality and ethical handling of information sources. According to her, feedback provided by AI-supported tools often misleads the user by representing misinformation and fake citations, which is unacceptable in the academic environment. Thus, she preferred not to rely unquestionably on the automated generated feedback, which induced the necessity

of comparing it with different credible information sources for nuanced understanding.

Carina illustrated her point by providing an example related to her profession,

*Carina: "I am also involved in a startup with a procurement platform for recycled plastics. They are also part of a circular economy strategy in **'D'** (country name), and it is a very complex topic. I realise that when ChatGPT gives me something, it scratches the surface, and some stuff is incorrect. So, with my knowledge, I have to go in and adapt what has been written or expand the text."*

As an EC practitioner, she expressed dissatisfaction with the AI-assisted responses on profession-related complex topics by a conversational chatbot. In this instance, her expertise and academic knowledge helped her comprehend intricate concepts. Her experience resonates with the previous participants concerning AI-generated incorrect information. From her point of view, the simplistic explanation generated by AI lacks relevant information and is inadequate for addressing complicated topics.

Freya outlined the limitations and scope of AI-assisted tools,

Freya: "I refused to use ChatGPT for a long time. I think everything should come from your mind because of my journalistic integrity and belief. You should be creative and also quite human, and how you talk to other humans is very important. But I use the AI tool "DeepL" - the language computing machine. I often use that in my personal life, being a foreigner in Sweden and looking at Swedish documents a lot for my job."

Freya explained her initial perception regarding AI-assisted conversational chatbots and emphasised human-centric communication for active interaction and creativity.

However, from her user experience, both in the personal and professional context, she held an optimistic view of *DeepL AI* for document translation. Here, working as an EC practitioner in Sweden, Freya adopted an AI-assisted tool to translate documents to overcome the language barrier in her professional and personal life as a foreigner.

Conversely, Elias focused on the positive aspect of AI assistance in academia,

Elias: "It has helped me to understand concepts. I have searched many times, for example, frame theory. It gives you an explanation. […] to think about that concept."

As an international student, he had a positive experience with AI support. He explained his experience regarding AI assistance in comprehending one of the EC contents named *Frame Theory*. He appreciated the simple clarification and explanation provided by AI-supported services, which significantly contributed to his understanding of the topic.

v) Critical thinking and influence on decision

In this theme, participants prioritised critical thinking before considering machine-generated feedback to improve their performance and expand their

understanding. They also provided insights into the ethical and thoughtful use of AI. According to Bertha,

Bertha: "For AI, People are probably not going to die because of it, but it has safety risks. For example […] cyber-attacks, and other internet safety. We will have to adjust to that as we do with other types of changes."

She recognised the undeniable outcomes of technological advancements and the widespread adoption of AI in all aspects of contemporary society. Based on her statement, it is evident that embracing an advanced technological approach can initiate challenging situations but also has some potential. She also acknowledged that we need to adjust to the pervasive nature of technological progression. Here, she illustrated the urgency of understanding AI-related dangers and safety issues by showing her concern about cyber-attacks and personal data security risks.

Carina mentioned that she typically asks for assistance from AI when she encounters a challenging situation in elaborating her ideas and highlighted the influence of artificially generated feedback on her thoughts;

Carina: "Yes, definitely it influences, and sometimes when I am stuck, I also do not know where to go or how to go further, so then AI gives me a direction. It automatically influences me because I would not use AI if I did not know it would not influence me. That was a prerequisite for me, and it would influence my decision. Because when I use a ChatGPT and perplexity AI, I know it will influence me because these are not my thoughts."

Her statements indicated that AI feedback could influence her decisions in the presence of uncertainty and unfamiliarity with the topic on which she lacked information and understanding. She also noted that the suggestions made by AI tools in response to her queries did not belong to her personally. Engaging with these tools explicitly contributed to her understanding by offering guidelines, ideas, and alternative options to accomplish her tasks. She believed that the conscious choice to engage with these tools could influence the thoughts and ideas of humans.

Diana underscored that the ability and competence of humans to comprehend diverse viewpoints and respond appropriately is entirely contingent upon their knowledge and expertise;

Diana: "As a communication specialist, it does not help me because I strategise, and I need to talk with people more to get their perspectives on this and how to put them around the table [...] It is not like I cannot use ChatGPT or any AI for this. [...] I only rely on my experience here and on my own skills."

As an EC practitioner, she anticipated the utilisation of AI in her profession. She pointed out the importance of active communication and engagement with different actors through conversation to figure out diverse perspectives regarding EC issues and interact with different actors through her interpersonal skills and expertise. Hence, human-centric decisions are required because, in the relevant context, human judgement should be prioritised over machine-generated feedback on resolving real-world EC-related problems. Since human engagement is mandatory

for this interaction and facilitating discussion, in this regard, the applicability of AI is limited.

Freya mentioned that these AI-assisted tools require careful handling and need to be considered from an ethical point of view;

Freya: "I think there probably needs to be a lot more education on how to use these tools ethically because there are a lot of voices that are left out when you use an AI machine, and being inclusive is important to what I do. So, inclusivity may go along with a little bit of diversity, making sure there is diversity and not just using one AI tool."

Freya concentrated on AI literacy and its ethical application. Here, she showed concern about the absence of inclusivity and exclusion of diverse perspectives in AI-generated feedback. AI-supported tools are trained on specific datasets and information; thus, these tools provide compromised and biassed responses, and relying solely on them may lead to overlooking other viewpoints.

vi) Perception and emotions

In this PET, Alice shared her views,

Alice: "I see a lot of negative news about that and those kinds of things. I have not been influenced about how to use it in academics, at least not positively." And "*One of my colleagues suggested that I use chat GPT to help me get going with job applications. I get inspired. Start writing. But otherwise, I think it is more the opposite; I get a lot of negative views through social media."*

Her statements showed that she had been exposed to negative discourses concerning AI from different external sources, such as social media. The presence of this controversial news and negative interpretation impacted her attitudes towards AI and refrained her from utilising it in academia.

However, she discussed the constructive application of AI in her professional environment, where one of her co-workers recommended taking assistance from *ChatGPT* to compose a job application. The changes in her perception were influenced by these two external factors.

Bertha asserted that the restrictions and discouragement imposed by academia had shaped her perspectives on AI.

Bertha: "I think that also affects my impression of it, that being told not to use it (in academia) also does not create the curiosity for me to do it."

She elicited pessimistic perspectives, and cautionary guidance from the teacher team impaired her thoughts. Thus, the restriction on the application of AI in academia profoundly influenced her attitude towards it. Consequently, she lacked the motivation to demonstrate any interest in it. In the academic environment, restrictions on the use of AI may implicitly influence students' perceptions regarding the future use of AI.

Carina reflected on her student life and said,

Carina: "If I had DeepL write, my sentences would have been even better. I am also happy I did not have AI tools because that was my work without help."

Her assertion highlighted her contemplation and self-reflection on applying AI tools for her academic writing tasks and indicated her ambivalent attitudes about adding AI assistance to complete her academic writing as a student. She believed that the outcome of having an AI assistant like *DeepL write* during her student life could have had both merits and demerits. However, she expressed her genuine feelings about it and appreciated the unavailability of this AI- tool then (in 2022), and she had not applied it to accomplish her academic task. This limited use of AI in academic environments enabled her to maintain academic integrity. As a former student of the ECM programme, her views signified the importance of relying on her skills and reasoning abilities for self-improvement.

According to Diana,

Diana: "I think it is now inside the system; we have these new tools[...] So, my emotions are mostly about the development of the tools because when you do not understand something, you are afraid of it. I do not understand it much properly now. That is why I am scared and concerned."

She believes these new tools are prevailing in our everyday lives; however, her limited exposure to these modern tools is a reason for her concern. However, her major concern ascended from a lack of understanding regarding the functions of AI and its potential repercussions. Thus, unease and apprehension are probable for ordinary users concerning unfamiliar technology. She added that confusion and misunderstanding around the application of AI made it frightening.

Freya expressed her concern with the widespread use of AI,

Freya: "I am really scared of this world we live in where we just Google something and get the answer… because that is kind of like the early days of AI, and we do not even realise that we are doing that every day[...] The same thing happened with Wikipedia. You put something into Wikipedia, and you know that many people generate it, and it is not a factual database, but you still take it as something that is probably a fact because you think many people have interacted with this."

She claimed that netizens are exposed to AI and unintentionally using AI-supported tools for an extended period, and she particularly mentioned about two popular information sources, that are *Google search and Wikipedia*. She said that the information presented by these websites is the compilation of diverse ideas of many people, which is readily accessible and available. The convergence of prevailing public opinions and factual information raises doubts about the authenticity and trustworthiness of the information. However, individuals are susceptible to the influence of such incomplete information and inclined to trust it, which she described as worrisome.

4.2.3 Ethical consideration

The final group theme of this study concentrates on the participants' ethical principles and values. In three PETs, they articulated their perspectives on the

ethical standpoints of acquiring knowledge and illustrated the impact of technological advancements on their values and beliefs.

vii) Learning process and ethics

Bertha expressed her thoughts on the widespread use of AI by students in academia,

Bertha: "I do not see why students would do it in academia […] that means someone is doing the work for you, which is not what it is about to be a student. As a student, you are supposed to learn because you are interested in a subject to enhance your knowledge about it."

She expressed her disappointment with the students' current approaches by asserting their reliance on AI in academia with generative AI. She shared her views regarding the students' attitude towards AI and its application to accomplish academic tasks that are inappropriate for them. From her standpoint, AI dependence on creating new knowledge impedes learning experiences and does not contribute to fundamental understanding.

In a separate statement, she pointed out an essential aspect of AI,

Bertha: "I am thinking maybe more people who have difficulties with dyslexia or something like that […] I also see that it can have pros that I am not seeing."

Her statement reflects that she generally does not advocate AI assistance in academia. However, she thinks these tools have potential for some students struggling with learning difficulties.

Diana explained her impression of *Grammarly* as a writing assistant;

Diana: "I used Grammarly a bit while studying, but it sometimes makes mistakes. I do not know how it works now, but when I was studying, I started to check the text with Grammarly, and then I learned that it sometimes made mistakes, [...] so now I prefer to follow my instincts."

Her user experience reflected *Grammarly's* limitations for text correction. According to her, it is prone to errors and may provide inaccurate text suggestions, so she perceived it as inappropriate for text editing. Thus, she preferred to depend on her existing knowledge and abilities to improve her writing.

Freya pointed out her concern regarding the implication of AI in the educational system and professional sector;

Freya: "I think that goes a little bit into what I was saying about having disclaimers and disclosures that you are using AI. I think transparency is really important."

She discussed the importance of transparency and disclaimers regarding AI in academic research. She argued that the implementation of these modern tools in academia should be dealt with ethical considerations, specific instructions, and guidelines. In academic research, ensuring transparency would be beneficial for figuring out the dilemmas regarding its application. Due to inaccuracies and inconsistencies in AI-supported information and feedback, it is crucial to deal with this carefully with proper disclaimers.

viii) Subjective preferences

In the previous PET, Alice expressed her preference based on her recent encounter with AI assistance and mentioned that she had recently started getting

help from AI to write job applications. She started using it minimally, and her subjective experience reflected the scope of AI. She stated about the influence of these tools on her performance,

Alice: "Maybe that is complicated. Because it helps you get going and create an understanding at your own pace, but on the other side, you need to understand the source material as it is written down too."

It is evident that she acknowledged the potential drawbacks of AI and simultaneously considered its possibilities, such as providing new insights based on the user's query. That might help comprehend the searched content, focusing on users' preferences to achieve learning outcomes. However, she again expressed concern about the requirements for source material and verifying the AI-written texts before implementation.

Considering her subjective experience and preferences, Carina asserted,

Carina: "With ChatGPT, if I have one sentence or want to know about something, I put it into ChatGPT, giving me ideas of how to expand. So, it provides more information, and I save time. So, I see it more as a time-saving tool."

She discussed that her tasks can be accomplished with the assistance of conversational chatbots. From her experience, ChatGPT is helpful in generating new ideas with text expansion. Moreover, it is capable of rapidly presenting a large amount of information and saves time. Thus, these conversational chatbots aided the users by providing new information and contributing to their existing understanding.

Freya compared her user experience with two different language translation services,

Freya: "I think DeepL in my work is much more efficient than Google Translate [...] There are gaps or missing words whenever it is translated. DeepL is much better with that because it also gives you options. Furthermore, based on my user experience, [...] It tends to translate a document much better and quicker. I do not have to go to a co-worker who speaks the same language and ask them to spend two days looking at the translation. So, I think efficiency is a driving factor."

She perceived *DeepL* as more efficient than *Google Translate*. She expressed her dissatisfaction with the translation provided by *Google Translate* and mentioned that its responses are full of errors and inconsistencies. Conversely, *DeepL Write* has AI-supported features and provides several translation options for users. Here, the user has the opportunity to critically evaluate the translated sentences and decide for themselves about their applicability. According to her, it is a helpful tool for accomplishing time-consuming tasks. She believed receiving assistance from AI-assisted translation tools is better than encumbering native co-workers for translation help.

ix) Emergence of AI and the application

This final PET discusses the participants' perceptions, attitudes, and ethical approaches towards the widespread application of AI in academic tasks and their EC professions. In this instance, Alice said,

Alice: "I think finding sources, reading them, and understanding them when you write is very important. But all that matters to you is that you can understand the wrong or missed things. Maybe AI tools can help you with this. It is complicated, but you should not use AI tools because it becomes easier."

In order to alleviate misconceptions and promote in-depth understanding, she again concentrated on the importance of source material and conventional learning methods for knowledge construction. However, she also mentioned that if students struggle to grasp certain concepts, they can seek additional support from AI-assisted sources for more clarification to enhance their understanding. She also pointed out the complexity of relying on these tools. Her viewpoints denoted that the implications of AI in the learning process could not be adopted due to convenience and availability. Hence, she mentioned that students should not perceive AI as an effortless option to satisfy queries and may not compromise their critical thinking skills.

Carina articulated her perception regarding the future use of AI,

Carina: "If AI is the future, you must go along, even though I think it is scary[...] I want to do everything by myself, but now I am realising, OK, now I see the benefits of AI. It can help me improve my work to some stages."

The statements illustrated her evolving attitude towards integrating AI as an EC practitioner. Initially, she preferred to complete her tasks independently. Eventually, she shifted her standpoint from resistance to more acceptance and appreciated AI assistance. Her fear stemmed from over-reliance on technology; therefore, she preferred to work self-reliantly. However, her statement implied the importance of openness regarding AI tools for enhancing work efficiency and effectiveness.

According to Diana,

Diana: "What I think about it is that AI will obviously change everything in science; how we process information and study is unavoidable. Unfortunately, people now fear it for understandable, rational reasons, but you cannot stop it. So, we must learn how to protect ourselves if we need to. We need to understand how information or personal security works, like how my requests are stored or not stored, etc., but also learn how to use it for the benefit."

She shared similar perspectives as previous participants, firmly believing that AI will continue to persist and profoundly influence the field of science with inevitable transformation. Additionally, she referred to the public perception of AI, which seems unpleasant and full of uncertainties. The underlying reasons are the unfamiliarity with advanced technical aspects and security risks associated with the

exposure of personal information. She claimed that personal data security is a vital concern connected with AI.

Elias pointed out the limitations of AI,

Elias: "AI will never be the same as a human mind. I would think that because an AI has a limit, it only does what it has been told to do. Moreover, the parameters have been set to function, but when it comes to the complex things about emotions that you cannot write in a code."

According to him, AI-supported tools never transcend human intellect and human-like reasoning and always lack human distinctiveness. Because of its inherent limitations that can perform merely with explicit human instructions. He believed that human emotions are nuanced and complex, and AI is insufficient to codify them. It lacks the innate quality of humans and the ability to process and replicate information in the subtle way humans achieve through their subjectivity, experiences, and perceptions.

Freya shared the transformation in her regarding AI,

Freya: "AI can be socially constructed in our worlds as good or bad, and other people can sway us about AI. I have already been changed by it in the professional setting because AI is starting to be used very efficiently and carefully. But I am not sure about being swayed about AI in the academic world necessarily [...] Because the academic world is a place where you can express many ideas and you can be quite strong in what you believe in, or you can be open to believing lots of different new things through all the exploratory conversations with different people."

She illustrated that social narratives, discourses, and shared experiences shape their impressions and perceptions of AI in society. These interpretations comprise both positive and negative aspects. She discussed how her stance towards it changed when she prudently dealt with it in the workplace.

However, she had contrasting perspectives regarding the academic application of AI and clarified her standpoint on its influence by considering academic ethics. She believed that academia is a place for creating new knowledge and understandings, and it ought to be unaltered by external influences like artificially generated insights. Her statements highlighted the interplay among subjective preferences, user experience, and explicit societal influential factors that shaped her perceptions of AI in her roles as an ECM student and EC practitioner.

4.3 Discussion

In the result section, the key findings are discussed in three distinct GETs that emerged from the assertions of the study participants. The result section has significant implications for understanding how the recent debate on AI concerns academic integrity and contributed to the ECM programme.

4.3.1 The basis of knowledge construction

The initial GET of this study explores the importance of prior knowledge regarding the role of AI in their learning endeavours. The students discussed the experiences relevant to their educational journey and professional development. The recent study by Cerratto Pargman et al. (2024) pointed out the limitations of AI-driven chatbots in academia. However, this study also acknowledges the limitations of AI, yet it also emphasises its' potential and scope based on the perspectives of ECM students from diverse academic backgrounds and nationalities.

The participants asserted they encountered AI mainly in their professional lives compared to the student life in the ECM programme. In academia, the widespread popularity of AI is relatively recent and has gradually evolved. The IPA study of Antony and Ramnath (2023) claimed that AI chatbots were useful in academic counselling and advising and serving as virtual tutors with individualised feedback and guidance. The familiarity with AI varied among the former ECM graduates due to their different academic sessions and the availability of AI in academia; however, they experienced a surge of AI in their current workplaces and became familiar with AI in their professional lives. They were enthusiastic about embracing these diverse AI-assisted services to assist them in accomplishing different tasks in workplaces despite their initial concerns regarding the efficiency and authenticity of AI-generated feedback related to academia.

In their review study on the open-AI Models and ChatGPT, Roumeliotis and Tselikas (2023) claimed that ChatGPT excelled at deductive and abductive reasoning but encountered difficulties with non-textual semantic reasoning. This finding implies that conversational chatbots have limitations in comprehending non-verbal content, which is one of the crucial aspects of EC and pertinent to human interactions. Here, the study participants also mentioned this limitation of AI in EC, and one of them (Elias) pointed out that human emotions can not be written with AI-assisted codes.

The study of Kim and Cho (2023) reflected that Student AI Collaboration (SAC) requires domain-specific knowledge and expertise of the students because they make their decisions based on AI-based recommendations. Thus, the prior knowledge and understanding of the student are crucial for critically reflecting on AI-generated feedback and making decisions deliberately.

The study participants also prioritised the traditional educational system as a reliable source of knowledge construction for the students. Their viewpoints specify the importance of anthropocentric knowledge to enhance comprehensive understanding and enrich learning experiences. Gilson et al. (2023) stated that the initial response of ChatGPT stimulates additional questioning and induces students to utilise their knowledge and logical reasoning (mentioned in Lo 2023). The statements of the participants also reflected that partaking in collaborative learning

with AI could help users expand their understanding and facilitate learning with new insights, diverse perspectives and rapid information processing. In this regard, Kim and Cho (2023) stated that it is apparent that the transformative phase in education will help learners achieve academic objectives through collaboration with non-human agents. In this study, participants acknowledged the merits of AI and considered it as a time-saving tool. Here, one of the participants (Freya) pointed out that to complement the users' knowledge and satisfy additional queries, it is crucial to ask appropriate follow-up questions to the conversational chatbots, which are associated with the users' prior understanding and background knowledge.

The discipline of EC concentrates on the direct interaction between humans through communication and promotes contextual meaning-making and understanding of diverse perspectives. Chiu et al. (2023) said that AI approaches replicate human thought processes by utilising systems that store the information and expertise of human specialists. Cox (2021) also pointed out that, in the context of higher education, the discussion centred on the potential of technology to dehumanise learning experiences. Here, the ECM alumni exhibited that machine-generated text is insufficient for addressing real-world environmental concerns and lacks communication aspects with generic responses.

According to Ablett and Dyer (2009), interpretation revolves around communication relating to active engagement, meaning-making, and information exchange. In EC, it is crucial to understand the engagement of different actors and their perspectives on environmental discourses rather than interacting with AI chatbots to address real-world challenges. In this instance, the participants highlighted the importance of human intervention in solving complex EC problems.

Bearman et al. (2023) pointed out that the profound epistemic impact of AI initiates the importance of critical thinking and adaptation for the students to thrive with this technological aspect. The participants expressed their viewpoints on relying on authentic information sources for insightful ideas and nuanced understanding and were also doubtful about the information sources of AI-supported responses. In this regard, Lo (2023) mentioned that chatbots have the potential to generate inaccurate and misleading information as well as plagiarised content. The study of Shoufan (2023) on students, perceptions regarding ChatGPT suggested that to utilise ChatGPT efficiently, students must have sufficient prior knowledge in the relevant field of study to critically evaluate the AI-written responses. Here, the study participants also endorsed that the pursuit of knowledge would be inadequate and incomplete if the users were oblivious to source materials and relied on AI.

Kasneci et al. (2023) illustrated that university students could employ LLMs to improve their writing tasks, besides allowing them to think critically while conducting academic research. In this study, participants contemplated applying AI-assisted tools or equivalently featured tools to improve their academic writing,

which helped them rectify their texts, eliminate grammatical errors and overcome language barriers. Guilherme (2019) also pointed out that advanced technological support in pedagogical endeavours has the potential to overall enhancement in education. The study findings exhibited the potential of AI- assistance in improving their writing assignments and providing translation support. Still, the participants preferred to critically reflect on AI-generated suggestions with their prior knowledge and evaluate their implications before incorporating them in accomplishing their academic and professional tasks.

4.3.2 Concerns about interacting with Artificial Intelligence

In the second GET, participants reflected on their perceptions and emotions regarding the authenticity and reliability of the information sources of AI-generated feedback. They also emphasised the importance of critical thinking and thoughtful consideration concerning these machine-generated responses. In this regard, Rahman and Watanobe (2023) stated that LLM is often trained with enormous data, but if it contains anomalies or biases, it could exclude some voices and produce unfair output. In this study, the participants also highlighted the primary constraints of these responses that lacked relevant information and eventually failed to satisfy their queries; instead, the provided responses were filled with selectively chosen information. Here, two participants (Carina and Diana) expressed their disappointment regarding the role of AI in handling complex topics related to environmental concerns, such as dealing with recycled plastic concerning the circular economy and the history of EC; therefore, AI-generated insights were insufficient for completing their tasks and ineffective in providing relevant insights, because these may appear simple and unbiased with a plethora of information; however, it is insufficient for addressing EC concerns. The participants preferred relying on their skills and expertise while dealing with artificially generated insights.

The study of Samuel et al. (2024) concentrated on human intervention and engagement with manual evaluation to enhance the reliability of the chatbot-generated information. The study participants contended that there is no alternative to traditional learning systems for knowledge construction and self-development. They acknowledged that AI may provide personalised feedback and support, yet it is unable to substitute human interaction. Thus, the findings indicated that the students can enhance their knowledge and deepen their understanding by critically engaging with their peers and teachers.

By reflecting on the importance of critical thinking, Kasneci et al. (2023) stated that the instantly generated information with less effort may have a negative effect on the users' ability to think critically and problem-solving proficiency. However, the study by Zhai et al. (2021) claimed that human-machine interaction could be helpful in developing the performances and creativity of the learners and allowing

them to think critically and make informed decisions. In this study, the participants prioritised the significance of anthropocentric knowledge in the context of EC due to the active engagement with other humans to understand diverse viewpoints; they also shared their inclination towards anthropocentric judgement.

Then, the participants acknowledged the presence of AI in their current workplaces, and some participants preferred to employ it to accomplish their professional tasks (such as language translation or initial brainstorming). George (2023) claimed that it could overcome communication obstacles and facilitate collaboration and knowledge exchange among students and educators from various countries or with distinct languages. “Social influence,” such as positive feedback and recommendations from peers and instructors, influences the willingness to accept the application of AI (Khan et al. 2019; Antony and Ramnath 2023). The study participants agreed that AI is pervasive in every sphere of life and reflected on the scope of AI assistance and its’ future implications. In the context of academia, Zhai et al. (2021) stated that the teachers' perspectives towards AI substantially influence the efficacy of AI in academic applications. In academia, the role of teachers and their attitudes regarding AI may significantly influence students' views on it. In this study, one of the participants (Bertha) expressed that she refrained from applying AI to her academic pursuits since her teachers had a negative impression of it, and another participant (Alice) pointed out that she was influenced by the related debates regarding AI in social media. Thus, the future implications of AI need further consideration in the academic environment and require addressing social influences. The study of Bearman et al. (2023) on discourses of AI in higher education suggested that universities must adapt to the rapidly evolving technology-facilitated environment, where AI is one of the integral components.

At the same time, the participants expressed their concerns regarding the safety of personal data and associated privacy risks when interacting with AI. Gherheș and Obrad (2018) highlighted the impacts of technological advancements in society; the authors said the application of technological aspects can undoubtedly improve human lives, but it is also evident that it initiates security threats, ethical concerns and social manipulation. Here, the study participants claimed that their perceptions and acceptance of AI were influenced by the negative discourses around its potential security threats, data privacy and unfamiliarity with technology. Moreover, social media also fostered negative interpretations of AI. Thus, they emphasised the importance of thoughtful implications of AI and careful handling of these AI tools to prevent security threats.

4.3.3 Rational reflection on ethical stances

The third GET of this study sheds light on the participants' ethical considerations and values regarding the application of AI in academia and the workplace.

According to Foltynek et al. (2023), the widespread availability of AI technology may amplify pre-existing forms of academic integrity and enhance dishonest academic practices. Moreover, the study by Cox (2021) pointed out that it is crucial to foster discussion regarding the challenges initiated by AI and robotics in pedagogy, as well as practical, ethical, and social justice concerns. Here, the study participants discussed the importance of the ethical use of AI to maintain academic integrity in the context of EC. In order to uphold the ethical stance, one of the participants (Freya) addressed the vitality of transparency and accountability regarding the implementation of AI. Hence, the study participants advocated for restricted use of AI in academia, as they believed students should focus on acquiring knowledge without being influenced by AI, and they should emphasise learning from source materials for comprehensive understanding to maintain academic integrity. However, according to them, AI may assist in initial brainstorming and provide nuanced explanations and insights on particular EC-related topics. Moreover, it may aid in improving writing tasks, but according to the study participants, it is an inadequate source for gaining knowledge thus, requires critical thinking before academic application. From their experiences as EC professionals, they stated that AI lacks the competence and expertise to address real-world EC issues and challenges. The participants experienced the emergence of AI in their professional environments and emphasised the unavoidable presence of this technological advancement; thus, it initiated the concern about its' thoughtful implications in EC contexts.

Foltynek et al. (2023) suggested that as modern society is increasingly automated, students will eventually come across AI in their professional lives; therefore, it is crucial to support students in developing an understanding of the ethical use of AI and acquiring essential skills during their educational journey. So, it is essential to educate students about digital literacy, enhance critical thinking abilities, and equip them for future academic and professional attainments that will allow them to effectively interact with AI in a secure, diligent, and ethical manner (George 2023).

5. Conclusion and Recommendation

This study highlighted the perspectives of ECM alumni regarding the applications of AI. They shared their experiences related to their academic journey and professional pursuits, where they pointed out the importance of human engagement in the learning process and knowledge construction in the context of EC. Moreover, they emphasised the significance of interpersonal communication, which is crucial to addressing real-life communication challenges that can not be investigated efficiently through AI-based communication. Since EC issues are typically intense and profoundly contingent on particular instances, these require direct human intervention and the participation of diverse human actors.

They emphasised prior knowledge and understanding for knowledge construction and illustrated the significance of the human-centric approach in the learning process. Therefore, they prioritised the conventional educational environment to foster the learning experiences of the students. They expressed their viewpoints on active engagement with peers, teachers and source materials, which are the most effective ways for knowledge construction. They shared their concerns about information sources and discussed the limitations of AI in the EC context. Additionally, they emphasised the importance of comparing AI-generated feedback with authentic sources and critically reflecting on AI-supported responses for precise understanding.

They also acknowledged that AI-supported tools can rapidly generate new ideas, improve writing tasks and provide translation support. The participants anticipated the inevitable implication of AI-assisted services in the traditional learning system in the future, which indicated the prospect of collaborative learning involving human-machine interaction.

Another key finding of this study pertains to learners' perceptions and emotional aspects regarding the widespread advent and application of AI. In this context, most of them expressed their apprehensions over the recent upsurge of AI due to its ambiguity, controversies and personal security issues. They suggested the thoughtful application of AI since AI-generated feedback is capable of influencing human decisions; therefore, AI-supported insights necessitate careful consideration before application for assigned tasks.

The study's final findings articulated their ethical viewpoints regarding the application of AI within educational and professional facilities. Their assertions

denoted that in academia, limited application of AI can streamline the learning process, and AI-assisted tools may provide additional learning support; therefore, these can be utilised with transparency and disclaimers. In the professional sphere, it still has limitations in addressing real-world problems because it lacks human perspectives and is developed with specific datasets with sceptical source materials. Nevertheless, it could be applicable for initial brainstorming and rapidly generate fresh insights on specific topics.

In conclusion, the current study concentrates on understanding the overall experiences of ECM students regarding AI; however, this thesis does not elucidate human-machine communication and interactions. Thus, further research should be undertaken to explore the perception of the ECM students about the role of this virtual agent as a communicator in the EC context by generating new insights and information (or disinformation). The findings may help to design academic tasks for future ECM students by considering the experiences and perceptions of the alumni and also aid in addressing the prospects and challenges relevant to EC professions due to the proliferation of AI.

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Popular science summary

In recent times, Artificial Intelligence (AI) has been a highly contentious and controversial topic that has garnered significant attention. It evokes both curiosity and apprehension related to its ubiquity and intense implementation. Subsequently, the ethical application of AI spurred an academic discourse, resulting in the emergence of divergent viewpoints and attitudes associated with this advanced technological aspect. The students showed profound interest in AI due to its' exclusive technical features and are unable to disregard its rapid advancement in the future. Therefore, it is reasonable to anticipate that the ubiquity of AI is inevitable, regardless of the user's awareness.

The purpose of this study was to conduct an in-depth investigation of the experiences of the Environmental Communication and Management (ECM) students at the Swedish University of Agricultural Sciences (SLU) regarding the application of AI in Environmental Communication (EC) education and professional milieus. The study included six ECM alumni who have experienced the surge of AI in their academic and professional endeavours. Since artificial intelligence has only recently become extensively used and has become the subject of intense discussion, the study participants had varying experiences with the emergence of AI in their academic lives due to its availability and exposure.

The participants are familiar with AI but had a pessimistic standpoint regarding its extensive implementation in the educational environment. The scope of AI is limited in the EC discipline since EC deals with a multitude of intricate and sophisticated environmental issues and considers diverse perspectives from several actors. It can only be achieved through human intervention. They articulated that AI can expedite the generation of new ideas, provide unique perspectives, and facilitate initial brainstorming. However, it is crucial to critically evaluate the artificially generated feedback with the users' prior knowledge due to the concerns about the authenticity, precision, and transparency of the information sources in AI-supported feedback.

The study findings will provide helpful insight to current ECM students on the influence of AI relevant to their learning process and highlight the application of AI in EC aspects. The application of AI is contingent upon personal preferences, yet institutional rules and regulations can also influence its ramifications. Hence, this study will provide students with a comprehensive understanding of ethical

applications in AI. Additionally, the teacher team might consider the students' perspectives for future academic tasks and activities related to the ECM programme.

In summary, these study findings reflect the perspectives of ECM students who have explicated their experiences about the prevalence, impact, and prospective use of artificial intelligence in the EC discipline.

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