A Simulation-Based Approach to Enhance Conflict Resolution through Non-Violent Communication and Large Language Models in Teamwork

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***Abstract*—This full research-to-practice paper explores how conflict mediation training and large language models (LLMs) support non-violent communication in conflict resolution in a 200-level undergraduate course on Systems Analysis and Design Methods. That is, to constructively address disagreements and align team efforts toward shared goals, effective teamwork does not need only technical skills, such as coding or problem solving, but also social skills including conflict resolution. Therefore, teaching students how to deal with disagreements can improve collaboration and the overall outcomes of a project. The intervention introduced students (n=70) to the Nonviolent Communication (NVC) framework, encouraging them to observe concrete actions that affect well-being, recognize feelings related to these actions, identify underlying needs, and make requests to enrich lives. Participants reflected on how trained LLMs, like ChatGPT-4o, could aid in conflict resolution by supporting the elaboration of arguments, the generation of follow-up questions, or rephrasing statements, in accordance with the NVC principles. By reflecting on additional questions that could support conflict management and how they could rephrase their statements using the NVC framework, this study aimed to assist students to refine their ability to manage conflicts and work toward resolving disagreements in their projects. Students participated in a role-based mediation simulation, where a mediator guided discussions using NVC principles. Participants used ChatGPT-4o to refine their mediation strategies in a simulated discussion—mediators generated additional questions to support consensus-building, while other participants rephrased their statements to align with the NVC principles. A thematic analysis was conducted on the participants' reflections, focusing on learning outcomes, their application of NVC, perception of LLM support, and confidence in mediation. Preliminary findings suggest that participants found the NVC framework helpful for structuring discussions and the use of LLMs useful for refining mediation approaches despite concerns about over-reliance on AI-generated responses and the "lack of reality" of the simulation. These reflections also encouraged students to think critically about the effectiveness of the NVC framework in conflict management and how LLMs could support better mediation strategies in other scenarios. This paper adds to the literature by reflecting on how AI-based tools, combined with conflict mediation training, can enhance communication and teamwork in education. Future work will refine the intervention and further examine its evolution in broader collaborative learning environments.**

***Index Terms*—Teamwork, Communication skills, Simulation.**

I. Introduction

Conflicts and disagreements frequently arise in collaborative learning environments, such as in teamwork, but they are often overlooked in educational settings, which can negatively affect teamwork and project success [1], [2]. Higher education research has provided valuable insights into promoting effective teamwork through collaborative projects [3]. While technical skills like coding and problem-solving have generally received more attention and emphasis in higher education, there is still a lack of structured guidance on how conflict resolution can prevent miscommunication, which can influence teamwork (e.g., performance and dynamics among parties involved in a particular situation), reduce its efficiency, and negatively impact overall project outcomes [4]. Therefore, this gap highlights a need for educational approaches that equip students with tools—such as AI-driven tools like ChatGPT-4o—and strategies to support conflict resolution effectively.

This study explores how integrating AI-driven technologies like ChatGPT-4o with conflict mediation can enhance students' ability to navigate conflict resolution in collaborative settings (i.e., teamwork), aiming to deepen their understanding of this phenomenon. By combining the Nonviolent Communication (NVC) framework [5] with large language models (LLMs) such as ChatGPT-4o, the study supports structured and constructive mediation. It follows a dual approach: introducing students to a well-established mediation framework while using AI tools to guide and refine their strategies. Although prior research has examined AI in education and conflict resolution separately, a gap remains in exploring how AI can support conflict mediation training in engineering education. Therefore, this study addresses the following research questions:

1) **RQ1**: What are the most prominent factors students identified in the simulated mediation approach using ChatGPT as a trained AI-driven tool?
2) **RQ2**: How do students perceive the NVC framework's effectiveness in teamwork conflict resolution training?

To explore these research questions, an intervention was implemented in a 200-level undergraduate course on Systems Analysis and Design Methods at a midwestern university in the United States. Students participated in role-based mediation simulations in which a designated mediator guided a discussion among team members using NVC principles. Participants used a trained AI-driven tool (ChatGPT-4o) to help generate follow-up questions, refine arguments, and rephrase statements to align with the NVC guidelines [5], following the transformative learning theory [6] involving a three-phase approach, comprising: (1) a LEARN phase, introducing participants to the NVC principles using different resources, (2) a PRACTICE phase, enabled by a trained LLM (ChatGPT-4o) following a simulation prompted to participants, and (3) REFLECT phase, answering reflection questions referring to overall perceived outcomes of the intervention [7]. A thematic analysis [8] of student reflections was conducted to assess learning outcomes, perceptions of AI-driven support, and perceived confidence in simulated role-based mediation to support conflict resolution in teamwork using NVC principles.

This paper contributes to the literature on STEM education by examining the effectiveness of the Nonviolent Communication (NVC) framework in conflict resolution training for undergraduate engineering students, exploring how AI-driven tools can enhance conflict mediation processes, and providing general insights into how AI can be used to leverage and promote social skills (e.g., communication and conflict resolution) in collaborative settings. Overall, findings from this study promote a reflection on the role of AI-driven tools in supporting conflict resolution through simulated role-based mediation using a trained LLM, which contributes to a better understanding of how these technologies can be integrated into educational curricula to enhance the development of both technical and social skills. Further research will refine this intervention and deepen the analysis to support and complement the preliminary claims presented in this paper.

II. Background

A. Teamwork in Higher Education

Teamwork is considered a fundamental skill in higher education as it prepares students for professional environments where collaborative and cooperative problem-solving is key [9]. Research indicates that employers seek graduates with effective teamwork capabilities nowadays, as workplace success increasingly depends on the ability to function in group dynamics [10]. Thus, higher education institutions have promoted the idea that students not only apply their theoretical knowledge but also develop important skills, such as communication, problem-solving, critical thinking, and adaptability, through collaborative environments [7]. As a result, capstone courses and collaborative learning environments encourage student interaction by assigning tasks that mirror real-life conditions [9]. By simulating professional settings, these capstone courses promote thinking of teamwork beyond technical proficiency to include critical thinking, leadership, and project management skills, guiding students to overcome obstacles they could face when working collaboratively in teams and also to consider different viewpoints constructively [11], [12].

In this context, effective communication skills enable students to express themselves clearly while considering multiple viewpoints when resolving conflicts due to differing opinions or disagreements in teamwork [13]. Reflective practices guide students in developing the skills necessary to reach a consensus when facing conflict scenarios or disagreements and provide them with constructive arguments overall. Students improve their group communication skills by discussing differences and learning from one another. That is, when team members communicate well, they can solve problems faster, avoid misunderstandings, create better solutions together, and build stronger relationships that make future teamwork easier, more productive, and thus more effective. According to research in STEM education, team dynamics—the way members of a team interact with one another—have a big influence on overall performance. These dynamics influence leadership philosophies, communication methods, conflict-resolution techniques, and team composition. While certain types of conflict, such as task-related disagreements [2], [4], can stimulate critical thinking, conflict resolution skills play a very important role in not affecting team cohesion negatively. This emphasizes how important it is for higher education institutions to guide students in developing effective conflict resolution and communication skills as part of their teamwork approaches so they can improve their performance in both academic and professional contexts by reflecting on how volatile team dynamics are.

B. Conflict Resolution in Higher Education

Different perspectives in a team can naturally lead to disagreements, which could result in a conflict [2]. As a result, it is very important to provide students with conflict resolution skills in order to minimize issues that may impact teamwork and overall collaboration. Conflict resolution training in higher education helps equip students to handle conflicts resulting from disagreements in ways that promote understanding and collaboration. However, this not only aids in problem-solving but also leverages the learning experience by training students on how to collaborate with other members considering other viewpoints [14].

Emotional awareness is an important component in conflict resolution, as understanding critically our own emotions and recognizing the feelings of others support a constructive approach to conflicts or disagreements [15], [16]. That is, students should be trained on how to express themselves assertively, effectively, and respectfully. Then, students who are self-aware and have empathy for others can resolve differences in a way that promotes an open discussion, leading to effective teamwork and better outcomes [2], [4]. That is, higher education institutions should equip students by having them reflect on how they can manage their emotions, transforming disagreements into opportunities for growth rather than obstacles [4], [15].

C. Large Language Models (LLMs) in Education

The literature has shown that large language models (LLMs) are transforming education by enabling more interactive, adaptive, and personalized learning experiences [17], [18]. By simulating human-like interactions, LLMs enable students to engage in dynamic complex discussions and receive and explore feedback in real-time [18]. This aligns with simulation-based learning, where students can practice decision-making in a controlled and safe educational setting by interacting with AI-driven tools engaging in simulated scenarios that mimic real-world challenges [19], [20]. Through LLMs like ChatGPT-4o, students may work and refine their skills (e.g., self-awareness, critical thinking, communication) in a safe (controlled) setting where their mistakes become opportunities for professional and personal development rather than obstacles to learning [21], [22].

LLMs have been employed in diverse educational settings to improve learning experiences and enhance overall student learning outcomes [17]. Literature has discussed and demonstrated the efficacy of these AI-driven tools in collaborative learning environments—involving teamwork and conflict resolution—aiding in developing and refining critical thinking and problem-solving skills, as these tools mimic or replicate complex real-world scenarios [3], [7]. This simulation-based approach is particularly valuable in disciplines that require experiential learning (e.g., STEM education), where students must engage with simulated environments to develop their skills in a safe (controlled) educational setting before applying them in real-world situations [19], [23], [24]. In fact, instructors have adopted LLMs into their teaching practices (e.g., programming learning, educational psychology), which ultimately highlights its effectiveness in fostering students' creativity, problem-solving skills, and critical thinking skills [22], [25].

III. Theoretical Framework

This study is grounded in the Nonviolent Communication (NVC) framework [5], which promotes empathy, respectful understanding, and constructive communication. This framework is based on four main principles:

1) *Observation without judgment*, encouraging individuals to describe situations objectively, focusing on what can be seen or heard rather than making personal interpretations or evaluations.
2) *Expression of feelings*, allowing people to communicate their emotions openly without placing blame, fostering empathy and mutual understanding.
3) *Identification of needs*, emphasizing the recognition of underlying needs behind feelings, making it easier to address the root causes of conflicts.
4) *Making requests*, involving the expression of clear, actionable requests that support cooperation and resolution without imposing demands.

These principles work together to encourage productive and constructive discussions in ways that develop mutual respect, understanding, and collaboration rather than creating or escalating conflicts due to disagreements or misunderstandings that could arise due to differing viewpoints. By focusing on the emotional aspects of conflicts, NVC encourages participants to move away from blaming or criticizing others, fostering a more constructive dialogue [26]. Specifically, for the context of this study, this framework is well-suited as it addresses both the technical and interpersonal dimensions of teamwork. Disagreements in group projects are common due to different perspectives, work styles, or expectations that may arise [27]. As a result, this strategy enables students to engage in conflict resolution by concentrating on their own feelings and wants, as well as the feelings and needs of those who share common goals. The transition from a problem-solving approach that focuses solely on technical skills to one that incorporates emotional and relational knowledge is necessary for effective collaboration in teamwork settings [26], [27]. Students can use NVC to participate in more open and empathetic communication, resulting in a better understanding of the perspectives of team members and overall cooperation.

IV. Methods

Figure 1 illustrates the research's conceptual design, which uses a three-step transformative learning approach to help students understand mediation in teamwork through role-based conflict simulations. The main learning goals were for students to: (1) learn the four core principles of Nonviolent Communication (Observation, Feelings, Needs, Requests); (2) apply these principles to analyze and resolve simulated team conflicts; (3) use an AI-driven tool to create NVC-aligned questions and rephrase statements for better dialogue; (4) reflect on how effective NVC and AI support are in mediation and their future use; and (5) leverage their understanding and confidence in handling conflict resolution in teamwork.

As shown in Figure 1, students first **LEARN** the core concepts of the Nonviolent Communication (NVC) framework through a short lecture, a video, and a written overview provided on the institutional platform (Brightspace). They are also introduced to a trained AI-driven tool (ChatGPT-4o), which has been preloaded with the NVC framework to support their interaction during the activity. Next, students **PRACTICE** these concepts by participating in a simulation-based role-playing activity, using the AI-driven tool to help refine their arguments and mediation strategies. In the final **REFLECT** phase, students answer open-ended questions to evaluate the effectiveness of NVC in conflict mediation, its impact on their confidence in applying these strategies in real situations, and their plans to use these skills to improve future teamwork. This instructional design aims to develop teamwork, assertive and nonviolent communication, and problem-solving skills while encouraging reflection on how AI-driven tools can enhance learning in mediation and conflict resolution.

A. Context and Participants

This study was conducted in a 200-level undergraduate course on systems analysis and design methods at a mid-

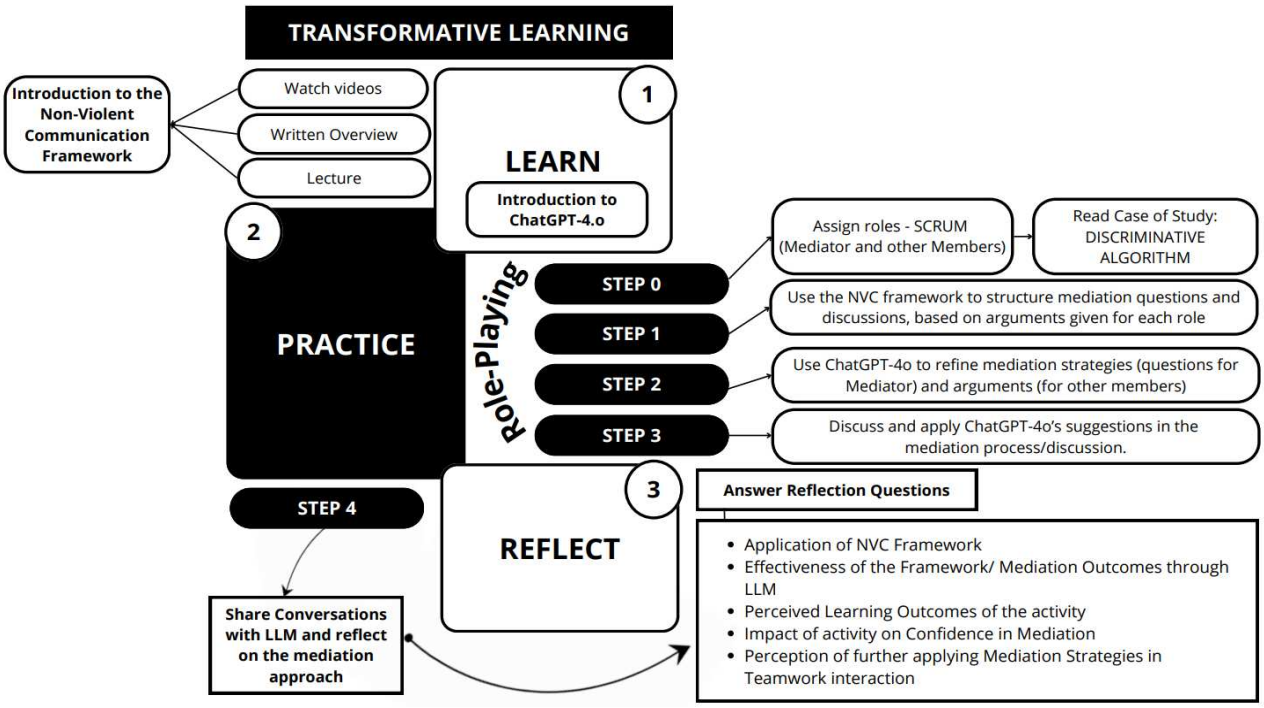

Fig. 1. Conceptual Design of the Learning Intervention on Mediation for Conflict Resolution as Students LEARN-PRACTICE-REFLECT

western university in the United States during Fall 2024. The course aims to prepare future information technology professionals with skills in systems analysis and design, emphasizing object-oriented concepts and Unified Modeling Language (UML) notation. It also incorporates SCRUM practices, which are iterative and include sprints, milestones, periodic reviews, and retrospectives. SCRUM promotes collaboration and is grounded in core values such as commitment, courage, focus, openness, and respect. Overall, this course encourages active learning [28], requiring students to work in teams to develop and prototype system solutions and apply project management, teamwork, and systems thinking skills [29], [30].

Seventy students (n = 70) participated in the intervention, working in teams of four assigned at the beginning of the semester for their final project. The intervention was carried out mid-semester, allowing the students to reflect on the activity based on their ongoing teamwork experience. Each team participated in a role-playing exercise to apply the Nonviolent Communication (NVC) framework to a conflict scenario. The case study, adapted from the *Online Ethics Center*, involved a team of software developers tasked with creating an algorithm to screen job applicants. The conflict arose because two team members felt that the algorithm discriminated based on zip codes, while others prioritized meeting the project deadline [31].

Each team member selected and assumed a specific role, with only one mediator (Scrum Master) and the other members selecting a role among the *Non-discrimination* and *Deadline-focused* teams. The mediator guided the team, considering the NVC principles, staying neutral while helping team members express their thoughts and needs, aiming to lead the team to a fair and effective conflict resolution. In addition, one part of the team focused on the ethical issues with the algorithm, arguing that it could discriminate against marginalized groups and emphasizing the need for fairness, as well as the legal risks associated with continuing with the current version. On the other hand, another part of the team was concerned about meeting the project deadline, as they wanted to keep the algorithm unchanged to avoid delays, even if it meant compromising fairness.

B. Data Collection and Analysis Procedures

This simulation-based role-playing activity was conducted over a 75-minute class period. Students participated in the intervention following a three-step transformative learning approach comprising the LEARN, PRACTICE, and REFLECT phases [7].

In the **LEARN phase**, students were introduced to the principles of NVC through different resources. Before the intervention, the students received an introduction to the NVC framework through a short lecture, where the researchers briefly explained its four stages (i.e., Observations, Feelings, Needs, and Requests) and how they align with the course objectives, which overall include teamwork, conflict management, and leadership. The students then watched a video that supported the conceptual understanding of the NVC principles and discussed their practical application. They also received a written overview, presented in the institutional educational platform (i.e., Brightspace), covering the important character-

istics of the NVC framework and how it aligned with the course objectives.

In the **PRACTICE phase**, participants participated in a simulation-based role-playing activity that focused on solving conflicts. They began by selecting roles, including one mediator (the SCRUM Master) and other team members who each assumed specific roles with defined arguments. This structured role assignment enabled participants to experience mediation from different perspectives, fostering a practical understanding of conflict resolution within teams. After the roles were assigned, the mediator used empirically defined mediation questions based on the Nonviolent Communication (NVC) framework to guide the discussion, while other members presented their arguments according to their roles. The application of the NVC framework aimed to maintain respectful and empathetic communication, focusing on resolving conflicts effectively.

To refine their approaches, participants utilized a trained AI-driven tool (ChatGPT-4o) to support the refinement of their communication approaches. The mediator enhanced their mediation strategies by receiving AI-generated feedback on their questioning techniques, while the other members refined their arguments based on the LLM's suggestions. This interaction introduced an additional layer of learning, demonstrating how artificial intelligence (AI) could support and refine mediation practices, if trained and delivered properly. Following this, the participants participated in discussions following the LLM's recommendations to their mediation process, enabling them to critically assess AI-generated insights and implement refined strategies in a simulated mediation environment.

Finally, in the **REFLECT** phase, participants reflected on their experiences by answering open-ended questions. In this phase, they assessed how they applied the Nonviolent Communication (NVC) framework during the simulation, its perceived effectiveness, and the outcome of the simulated mediation strategies, including also the use of the AI-driven tool to support argumentation. Participants also considered how the activity leveraged their learning on conflict resolution through mediation involving principles of the NVC framework, its impact on their confidence in real-life mediation, how they could apply NVC strategies to improve their own teamwork practices further, and the challenges they faced during the activity.

Overall data were collected through open-ended reflections after the intervention. These reflections were analyzed involving Thematic Analysis [8] to assess how well students understood and applied the NVC framework. The process started with data familiarization, where the researchers iteratively read the student reflections to understand the content deeply. Then, they created initial codes by identifying important parts of the data related to the research questions, which were later grouped into themes, helping them improve each emerging theme and leading to clear definitions and names that captured the essence of the data. The analysis focused on three main dimensions: (1) the effectiveness of NVC in resolving conflict, (2) students' perceptions of the mediation process and its impact on communication, and (3) their self-reported confidence in using NVC in future team interactions. The results were used to evaluate the educational impact of the activity and its alignment with the course objectives. In general, the researchers approached this analysis from an engineering education perspective, aiming to understand how students develop skills in applying Nonviolent Communication through mediation for conflict resolution in teamwork, thus guiding the interpretations of student reflections analyzed.

V. Results

A thematic analysis of student reflections was conducted to identify salient factors and commonly reported themes regarding the simulated mediation approach using a trained AI-driven tool. That is, from the responses provided by the students as part of their reflections after participating in the intervention, eight emerging codes highlighted the perceived learning outcomes of the intervention. Figure 2 illustrates the prevalence of each code by depicting the percentage of participants who identified them as significant. These factors are the following: Enhancing Communication (***EC1***), Emotional Intelligence (***EC2***), Perspective-Taking (***EC3***), Confidence in Mediation (***EC4***), Recognition of Nonviolent Communication (NVC) (***EC5***), Further Practice (***EC6***), Team Communication (***EC7***), and Constructive Feedback (***EC8***).

The results suggest that the codes identified with the highest prevalence among participants were ***Recognition of NVC (EC5)*** (78.57%, n=55), ***Team Communication (EC7)*** (72.86%, n=51), ***Confidence in Mediation (EC4)*** (68.57%, n=48), and ***Further Practice (EC6)*** (58.57%, n=41). The widespread identification of these aspects suggests they represent common areas of student experience and frequently perceived learning outcomes related to their mediation experiences. ***Recognition of NVC (EC5)*** was the most frequently reported code by participants, emphasizing how a significant

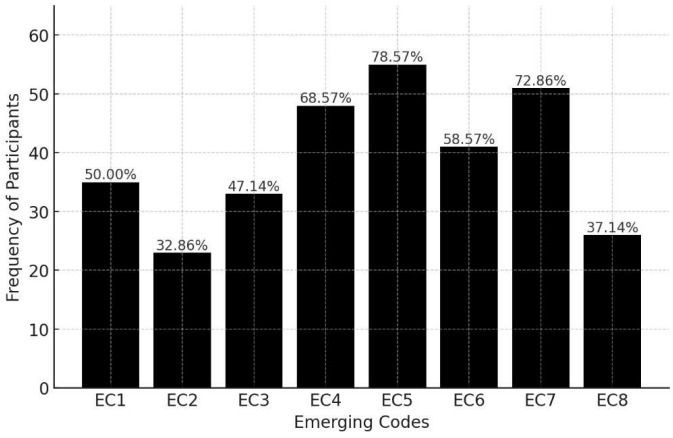

Fig. 2. Emerging Codes from Thematic Analysis. *Note: The bars represent the number of participants who identified each code as significant.*. **EC1** = Enhancing Communication, **EC2** = Emotional Intelligence, **EC3** = Perspective-Taking, **EC4** = Confidence in Mediation, **EC5** = Recognition of Nonviolent Communication (NVC), **EC6** = Further Practice, **EC7** = Team Communication, **EC8** = Constructive Feedback.

number of students acknowledged the role that structured and empathetic communication plays in resolving conflicts. Particularly, since the intervention focused on applying NVC principles within a realistic conflict scenario—a software development team debate between fairness and deadlines—this suggests that from this activity, students could understand the value of intentional language use and non-reactive or emotional communication. These results also support the idea that conflict resolution is a structured skill that can be enhanced and refined by utilizing frameworks such as the NVC, beyond emotional intelligence. For instance, one participant noted that AI-driven tools can help students practice communication strategies that lead to more effective, professional, and ethical conflict resolution in teamwork, by sharing:

> "*The NVC framework worked positively in having a constructive, empathetic conversation. By handling specific observations and clearly expressing feelings and needs, the conversation changed from a potential argument to a more solution-oriented conversation*".

Furthermore, this intervention prompted students to play opposing roles between two parties differing in their viewpoints. A significant portion of participants (47.14%, *n*=33) found the AI-driven simulation useful in developing their ability to see conflicts from multiple perspectives (i.e., ***Perspective-Taking (EC3)***). This suggests that structured mediation scenarios help students develop cognitive flexibility, allowing them to switch between different points of view in their projects. In fact, considering the transformative results of developing and working on the ability to step into others' points of view and understand conflicting perspectives, a participant shared that "*engaging with different viewpoints in a mediated setting helped* [...] *reduce defensiveness and facilitate mutual understanding*".

Literature emphasizes the importance of "perspective-taking" in conflict resolution, as it fosters empathy and reduces adversarial thinking, thereby enhancing students' ability to mediate conflicts constructively in team settings. While AI-driven simulations can support conceptual understanding, they should be complemented by hands-on experiences—such as in-person mediation sessions or role-playing activities—to strengthen students' real-world conflict management skills. Notably, a key theme that emerged from the intervention was the need for ***Further Practice (EC6)***, identified by 58.57% of participants (n = 41). This theme arose during a simulation that placed students in an ethical dilemma, reflecting the complex challenges they may face as future professionals working with technology, as shown in Figure 2. These findings underscore the value of structured mediation training in engineering education, especially in project-based environments that involve ethical, logistical, and interpersonal challenges. While AI-driven tools offer meaningful insights, mediation is a skill that benefits from continuous practice and reflection. As one participant noted, "*[m]ediation is always going to be uncomfortable, so this did help make it more reasonable to deal with* [...] *mediation is a skill that improves over time*."

Students found AI-generated feedback useful for improving mediation skills, especially in SCRUM-based team settings. As shown in Figure 2, 37.14% (*n*=26) identified ***Constructive Feedback (EC8)*** as a key learning outcome. One participant stated:

> "*[S]eeing ChatGPT rephrase my responses that I already thought were non-violent and make them even more non-violent was insightful. There are many nuances of language that can have the impression of violence without any intention to be violent*".

While 68.57% (*n*=48) reported increased ***Confidence in Mediation (EC4)***, some emphasized the need for real-world experience, with one claiming: "*while this experience opened another manner of confronting conflict, it did not exactly stimulate the true feelings of anxiety and confusion*". Other outcomes included ***Enhancing Communication (EC1)*** (50%), ***Emotional Intelligence (EC2)*** (32.86%), and ***Perspective-Taking (EC3)*** (47.14%), suggesting a leverage on empathy and group cohesion. As one participant shared "*[b]y remaining unbiased but also empathetic, helped create a neutral environment where everyone felt heard*", later elaborating on how "*by focusing on observations, feelings, needs, and requests help keep discussions clear and reduce tension, making it easier to find compromises, prevent misunderstandings, and build trust within a team*".

The emerging codes from the thematic analysis were then logically organized into three resulting major themes following an axial coding, which represent three major learning outcomes from the AI-driven mediation experience by the participants.

From this axial coding, the most frequently mentioned theme, ***Non-Violent Communication and Practice (NCP)*** (*n*=66), highlighted how structured frameworks like NVC support respectful and empathetic conflict resolution (mediation) in teamwork. For example, a participant shared:

> "*This framework* (NVC) *helped me restructure my communication process and gave me a baseline for what I said. It made confrontation easier and less threatening or intimidating*"

This participant reflected on the ability of the framework to guide less confrontational dialogue. Moreover, ***Communication and Mediation Skills (CMS)*** (*n*=58) emphasized the importance of clear communication to avoid escalation, as illustrated by another student who noted that applying the NVC framework helps to "*not escalate the situation and reach a conclusion in a respectable manner*". On the other hand, ***Perspective-Taking and Emotional Awareness (PEA)*** (*n*=47) highlights the role of empathy and emotional regulation in conflict resolution. In fact, a participant noted that NVC helps on getting differing "*viewpoints across in a way that shows empathy and understanding of why the opposing team feels the way that they do*", while another added how "*patiently listening to both sides of the argument and provide extra reasoning to each argument help the opposing side understand why that specific argument is provided*". Thus, while students found

the AI-driven mediation overall useful for conflict resolution training, enabling them to practice structured communication and to leverage their confidence, many also expressed a desire for more realistic and emotionally complex scenarios, as could rise in real-world contexts, to fully apply these skills.

In addition, to analyze students' perceptions of the effectiveness of the Nonviolent Communication (NVC) framework in conflict resolution and its impact on their learning process, a secondary thematic analysis was conducted. This analysis specifically examined responses to the following reflection questions: *How well did this framework work? What was the outcome of the simulated mediation?*

From this analysis, three major themes emerge: (1) Enhanced Clarity and Structure in Conflict Resolution, (2) Emotional Awareness and the Development of Empathy, and (3) Challenges in Applying the NVC Framework in Real-World Interactions, highlighting the strengths and challenges students encountered in using the framework in the intervention, as indicated in Figure 3 depicting the frequencies of mentions made by participants in their reflections.

As illustrated in Figure 3, many participants (n=42) highlighted that the NVC framework helped them structure their thoughts and articulate their perspectives more effectively in conflict situations, resulting with the ***Enhanced Clarity and Structure in Conflict Resolution (ECCR)*** theme. The results suggest that the NVC framework provided a clear step-by-step method for addressing conflicts, making it easier for them to approach discussions with disagreements. For instance, one participant noted that "(the NVC framework) *allowed to communicate my point and concerns in a way that made both parties feel seen and heard, as no one feels as if their concerns were ignored* [...]".

On the other hand, beyond providing structure for the arguments and mediation questions, students also described how the NVC framework deepened their emotional awareness and enhanced their ability to empathize with others even outside of conflicts. As a result, the theme of ***Emotional Awareness and the Development of Empathy (EADE)*** also emerged from their reflections (n=35). Students were able to better understand others' viewpoints and reduce tension by understanding the role of their emotions in conflict resolution scenarios for all parties involved—emotional intelligence and empathetic communication. In fact, some participants claimed:

> "*The framework* (NVC) *worked well because we were able to get well-framed questions* [...] *it* (the NVC framework) *worked well because it allowed for me to create a sense of empathy towards the other people involved in the argument* [...] *it* (the argument) *is more likely to be settled and allows for both people to come to an agreement*".

Nonetheless, while participants reflected on the benefits of the NVC framework for conflict resolution in teamwork, a third theme that emerges is the one referring to the ***Challenges in Applying the NVC Framework in Real-world Interactions (CARI)*** consistently (n=6). For example, one participant argued that the contribution or influence of AI-driven technology in mediation processes can be limited, by saying: "*The responses by an LLM matched my own very similarly. I suppose this means I have succeeded in practicing the framework, or that the LLM did not help very much*". This shows that the LLM did not fully encourage deeper critical thinking during the simulated conflict scenario. Furthermore, many students acknowledged that the NVC framework might work well in structured environments, but they also understood that in the real-world this might differ, considering the complex nature and particularities of conflicts, which might be more difficult to handle than those in the simulation. For instance, one student noted:"*I do believe this can be in real life more challenging it would be dealt with more serious problems*". Consequently, while the NVC framework was perceived generally helpful by the participants, they highlighted the need of paying more attention to human interactions (i.e., human factors), real-world contexts, and the complex nature of conflicts. In fact, a participant reflected on the relevance of this educational AI-driven simulation for mediation purposes, by stating: "[...] *it was not industry realistic* [...] *the utilization of ChatGPT did not help improve my understanding of mediation* [...]".

This highlights an important point about educational simulations, in which if the scenarios presented are perceived as disconnected from real-world challenges (e.g., real cases in industry), the learning experience may become less meaningful for some learners. Furthermore, while the NVC framework fostered structured discussions, some participants believed that AI-driven mediation restricted a deeper dialogue between the parties involved. For example, a participant shared: "*My group did not have real dialogue about the issue provided* [...]", suggesting that unlike human-led mediation, which allows more natural back-and-forth, AI's guidance may have made discussions feel less spontaneous.

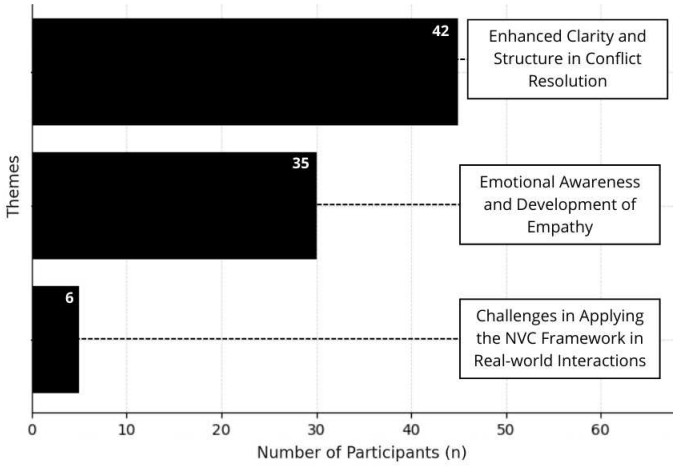

Fig. 3. Emerging Themes from Secondary Thematic Analysis. *Note*: *The bars represent the number of participants whose reflections contributed to each theme regarding the NVC framework's effectiveness.*

VI. Discussion and Implications

The use of AI-driven tools to introduce mediation practices in conflict resolution has benefits and challenges. In this study, we investigated the most salient factors that students identified in the simulated mediation approach using ChatGPT trained in Nonviolent Communication (NVC) while also examining students' perceptions of the effectiveness of the NVC framework for conflict resolution. The results, described in Section V, demonstrated that if properly guided, students can effectively learn and practice social skills using LLMs. While students commonly utilize these AI-driven tools for technical knowledge learning [17], our research highlights the value of utilizing trained LLMs to develop social competencies such as team communication and conflict resolution [18]. Therefore, with this educational approach, we provided students with a structured lens to address conflict resolution in team interactions through mediation using NVC principles. The controlled and structured environment provided by these tools allows students to engage in practice without potential judgments or emotional pressures of real-world conflict situations, which ultimately enables them to focus on expressing their emotions, elaborating on their viewpoints, and leveraging their active listening and communication skills [7], [32].

In addition, using trained AI-driven tools to introduce mediation practices in conflict resolution has both benefits and challenges. Although LLMs simulations cannot fully replicate emotional engagement and human dynamics, such as nonverbal cues, tone, gestures, and emotional reactions [2], [16], our findings suggest that they still foster teamwork abilities, including communication and conflict resolution. The controlled environment provided by the case study and the LLM interaction allowed students to practice non-violent communication strategies that help teams resolve conflicts. While acknowledging that this scaffolded approach is particularly valuable for engineering students who are usually unexposed to conflict resolution or communication training, it also reduces anxiety and/or social pressure that might diminish learning in unsupported team dynamics [2], [16]. In supported learning environments like this one, students can experiment with a guiding framework, receive timely feedback, and refine their communication and conflict-resolution skills before applying them in uncontrolled team settings. These findings align with literature indicating that learning environments that reduce emotional pressure improve students' confidence and engagement in conflict resolution scenarios [7]. The AI-driven simulations are unable to completely solve the problem of emotional engagement in real-world situations, even while the simulated environment helps students practice structured ways. This supports the idea that AI-driven tools for conflict resolution should complement, not replace, human interactions and emotional engagement [18].

Furthermore, our findings suggest that students recognized the limitations of LLM interactions for comprehensive social skills development. Two valuable findings emerged from this situation. First, students acknowledged that human interactions remain essential for developing authentic conflict resolution strategies, with AI-driven tools serving as supplementary training rather than a replacement [17]. Second, effectively learning from AI requires both properly trained LLMs and the maintenance of a critical mindset to identify and avoid potential AI hallucinations or false responses [33]. In fact, the AI-driven approach led participants to reflect on how they could communicate their feelings and needs clearly by also understanding differing viewpoints or disagreements [27]. This highlights the importance of integrating AI-driven technologies with structured frameworks, such as NVC, to support the learning of social skills like communication and conflict resolution [7], [32].

Moreover, maintaining a conscious approach to AI-driven tools for learning represents an important metacognitive skill that could help students as AI continues to position itself in educational and professional environments. These results highlight the value of integrating AI-driven tools with structured frameworks, such as NVC, by providing students with guidance on how to communicate constructively and manage their emotions effectively in conflict scenarios [2], [16]. However, while LLMs can assist students in shaping their arguments/questions, they might overlook emotional human factors that naturally arise in human interactions and emotional engagement [15], [21].

VII. Conclusions and Limitations

This study highlighted both the benefits and limitations of using AI-driven tools, such as ChatGPT, for mediation in conflict resolution training in higher education. Although the intervention received a generally positive response from the participants, the findings also show that real-world conflicts—like those involving ethical dilemmas—require a level of engagement and immersion that AI-driven simulations alone cannot fully replicate.

Despite its limitations, this study highlights the value of structured training and AI-driven simulations in higher education for conflict resolution training. Hence, by fostering reflection and critical thinking, it strengthens the students' ability to reflect on the principles of Nonviolent Communication (NVC) framework, enabling them to resolve conflicts or disagreements in teamwork constructively and collaboratively. Therefore, this educational approach not only leverages the understanding of mediation guided by frameworks like NVC but also equips students with the practical skills they need for future interactions in academic and professional settings by utilizing AI-driven technologies like ChatGPT to support simulations that promote nonviolent conflict resolution.

The AI-driven mediation activity of this research demonstrated both strengths and challenges. The learning outcomes from the AI-driven mediation activity reveal both strengths and challenges, particularly with AI-driven technologies like ChatGPT-4o guiding participants to structure their questions and arguments based on Nonviolent Communication (NVC) principles. While this approach supported participants in focusing on empathy and active listening for conflict resolution,

the results suggest the need for further research, practice, and real-world application to better examine how these skills are effectively applied outside of the simulation presented in the intervention. This suggests that a combination of AI-driven tools and traditional face-to-face training is necessary for a more effective conflict resolution education.

Nevertheless, the results of this study also show that AI-driven role-playing simulations can successfully involve students in conflict resolution training, offering a controlled environment for leveraging skills to face conflicts, communicate in a nonviolent way, and gain confidence in using these principles. By integrating AI-driven tools with traditional in-person instruction, students can improve their mediation skills and leverage their understanding of mediation in conflict resolution by introducing frameworks such as the Nonviolent Communication. Further research will be conducted better understand how intervention involving AI-driven tools support mediation in conflict resolution training by examining their impact on students' learning experiences and identifying alternative strategies (e.g., alternative instructional designs) to enhance their effectiveness in educational settings.

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