Check for updates

ACM DIGITAL LIBRARY | Association for Computing Machinery | acm open

Latest updates: https://dl.acm.org/doi/10.1145/3743049.3743073

PDF Download
3743049.3743073.pdf
29 December 2025
Total Citations: 0
Total Downloads: 800

Published: 31 August 2025

Citation in BibTeX format

MuC '25: Mensch und Computer 2025
August 31 - September 3, 2025
Chemnitz, Germany

RESEARCH-ARTICLE

Groups and AI: How Access to Generative AI Influences Creative Teamwork

PAUL MILES PREUSCHOFF, RWTH Aachen University, Aachen, Nordrhein-Westfalen, Germany

HCI research on Creativity and AI in Groups, Deceptive Patterns & Immersion.

RAGHAD ZAGHAL, RWTH Aachen University, Aachen, Nordrhein-Westfalen, Germany

OLIVER NOWAK, RWTH Aachen University, Aachen, Nordrhein-Westfalen, Germany

JAN BORCHERS, RWTH Aachen University, Aachen, Nordrhein-Westfalen, Germany

Open Access Support provided by:

RWTH Aachen University

MuC '25: Proceedings of the Mensch und Computer 2025 (August 2025)
https://doi.org/10.1145/3743049.3743073
ISBN: 9798400715822

Groups and AI: How Access to Generative AI Influences Creative Teamwork

Paul Miles Preuschoff
RWTH Aachen University
Aachen, Germany
preuschoff@cs.rwth-aachen.de

Raghad Zaghal
RWTH Aachen University
Aachen, Germany
raghad.zaghal@rwth-aachen.de

Oliver Nowak
RWTH Aachen University
Aachen, Germany
nowak@cs.rwth-aachen.de

Jan Borchers
RWTH Aachen University
Aachen, Germany
borchers@cs.rwth-aachen.de

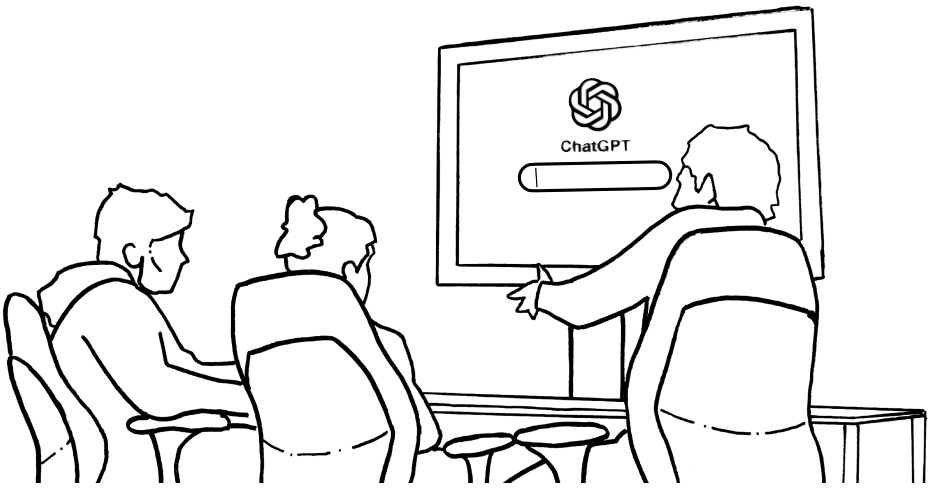


Figure 1: Our goal was to study the impact that access to generative AI tools has on creative collaborative processes and their results. To this end, groups of three participants worked on a creative marketing task with access to either ChatGPT or a standard web search engine for support. Afterward, they judged their results and their process, and externals also reviewed the results.

Abstract

As generative AI tools spread to creative domains like design thinking, studies indicate that, while this can be inspiring, users may also explore their own creativity less. To better understand this effect, we conducted an experiment observing collocated groups working on creative marketing tasks, with access to either generative AI or a traditional web search engine. Participants then rated their process and results. In a second study, externals rated the groups' results. We found that external ratings for AI-supported results were slightly better, while self-ratings were not. However, the *process* without AI was perceived as harder but also more creative, and we observed higher collaborative engagement. Access to the AI tool was perceived to make the task easier and quicker, but also less engaging and fun. Our findings imply that creatives should consider that adding generative AI to their team processes may impact not just workload, but also enjoyment.

CCS Concepts

• **Human-centered computing** → **Empirical studies in HCI**; *Empirical studies in collaborative and social computing*.

Keywords

collaboration, generative AI, creativity

This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivs International 4.0 License.

MuC '25, Chemnitz, Germany
© 2025 Copyright held by the owner/author(s).
ACM ISBN 979-8-4007-1582-2/25/08
https://doi.org/10.1145/3743049.3743073

ACM Reference Format:
Paul Miles Preuschoff, Raghad Zaghal, Oliver Nowak, and Jan Borchers. 2025. Groups and AI: How Access to Generative AI Influences Creative Teamwork. In *Mensch und Computer 2025 (MuC '25), August 31–September 03, 2025, Chemnitz, Germany*. ACM, New York, NY, USA, 15 pages. https://doi.org/10.1145/3743049.3743073

1 Introduction

Generative AI (GenAI) tools are rapidly becoming easily accessible and widespread among the general population. ChatGPT, one of the most popular tools for generating text and images, crossed the million-user mark only five days after its release in November 2022. In February 2025, it was one of the world's ten most-visited websites.[1] This development has a major impact on many aspects of everyday life: GenAI tools, such as DALL-E and GPT-4, transform the way people create media, communicate, and collaborate [6, 24], they change creative processes when involved [14], and they influence creative teamwork, a crucial driver of innovation [11]. While this can be inspiring, it can also impede creativity and limit personal growth over time [14]. As GenAI tools can take human roles such as tutors or teammates [11, 14], it is unclear how collaborative group work changes when such an agent is added to the group context.

Therefore, we conducted two studies that investigated how the presence of a current GenAI tool impacts collaboration in co-located creative teams. *Study 1* compared having access to ChatGPT to having access only to a standard web search engine in a collaborative product ideation task. Participants were asked to ideate marketing campaigns for made-up products involving product names, slogans, core selling points, and sketches. We observed group behavior and measured our participants' self-perception and their perception of the group's result. To identify to what extent using AI in such a setting influences the external perception of the campaign, *Study 2* evaluated how the campaigns created in *Study 1* are rated by externals who were not involved in their creation and did not know if GenAI was involved. Thus, our overall research question was

> ***RQ:*** *How do GenAI tools impact the creative process and outcomes in co-located teams?*

We unpacked this into four more specific questions:

> ***RQ1:*** *How do GenAI tools influence collaboration dynamics in the creative process of a co-located group?*
> ***RQ2:*** *How do participants perceive the role of such a tool in their creative group work?*
> ***RQ3:*** *How does such a tool impact the way group members perceive their group's creative result?*
> ***RQ4:*** *How does the involvement of such a tool impact the quality that external people see in a group's creative result?*

Overall, we observed that some critical communication behaviors occurred 2 to 4 times more often when there was no GenAI tool accessible. This included for example presenting new ideas or discussing details. While the GenAI output was perceived as rather positive, some participants felt that it made them less creative. Most of the participants perceived the GenAI tool as a guide, not a leader or a teammate. The process without GenAI access posed significantly more mental load and was often described as being harder. But it was also considered more independent, more creative, and less distracting. Having access to the GenAI tool was typically considered easier and quicker, but also less fun, less engaging, and less creative. Using the GenAI tool did not lead to any significant differences in the self-reported creativity ratings for our participants. While the creativity ratings of externals did not show an overall tendency for GenAI assisted results, they found the campaigns involving GenAI significantly more organized, practical, appealing, and well-defined for one of the tasks. They also ranked those results slightly better.

Our findings contribute to a better understanding of the impact that access to GenAI tools can have on co-located creative teamwork. They indicate that involving these tools leads to results of similar quality while making creative work easier, but also less social and fun.

[1] https://www.semrush.com/website/top/ (accessed April 2025)

2 Related Work

We provide an overview of existing research on group creativity as a whole, with a particular focus on the impacts of AI tools that have been identified to date.

2.1 Creativity in Groups

Creative processes can be structured into four consecutive stages: Q&A (defining the problem and gathering information), wandering (brainstorming), hands-on (choosing and combining ideas), and camera-ready (evaluating and presenting final ideas) [9]. In such processes, creative innovation is often not accomplished by individuals but by the social creativity of a group [7]. Such collaborative processes differ from individual creativity, as cognitive, motivational, and social processes influence each other to form the creative group process [17]. Social creativity can, for example, involve collaboration, idea sharing, and conflict resolution in ideation tasks [15] or collaboration, improvisation, and emergence when performing live with others [21]. Typically, it includes multiple cycles of divergence and convergence, with ideas spreading out in different directions before beginning to focus again. More interactive groups tend to perform better at convergent tasks [13]. Collaborative environments facilitate the sharing of diverse perspectives and collective knowledge, disagreements in a group increase exposure to different perspectives [17, 19]. However, group collaboration can also reduce creativity due to social dynamics, such as motivational loss, evaluation apprehension, and production blocking [16].

2.2 Generative AI in Creative Processes

AI tools are becoming widely accessible and can be applied to many domains. They can be categorized into four groups: Editors, Transformers, Blenders, and Generators [9]. ChatGPT, for example, is a popular text and image generator. So far, AI tools mostly support the hands-on and camera-ready stages of creative processes but offer less direct help for Q&A or wandering [9]. Such tools have reshaped many different fields, ranging from computer science to creative arts. There, they are often used, for example, for image and text generation, music composition, and chatbots [2]. AI tools have been observed to accelerate and enhance creative processes like design thinking [18].

Expanding the scope of GenAI to more creative contexts, Yusa et al. reviewed six case studies exploring how AI can be integrated into artistic work. So far, artists have been found to prefer AI for suggestions when they experience artistic blocks, viewing AI as a collaborative partner rather than a tutor [10].

2.3 Generative AI Impacts Social Creativity

AI tools, such as DALL-E and GPT-4, are transforming the way people create media, communicate, and collaborate with each other [6, 24], and transform creative processes when involved [14, 22]. This can be done actively by an AI providing dynamic suggestions throughout a design process [5]. Since AI tools are widely used by the public, it is important to study their impact on social creativity [25]. Recent findings indicate that users who perceive a generative tool as a teammate often rely on its input, and explore their own creativity less [14]. While it can boost short-term performance, AI assistance might hinder long-term creative independence, especially for divergent tasks [12]. This might lead one to assume that GenAI should be used at the beginning of a creative process, as this is typically converging, but other work has shown that this reduces the number of original ideas notably [20]. On the other hand, a between-subject study conducted on AI-assisted and human-only groups in an educational setting found that AI-assisted ideas were rated as more creative, detailed, and diverse [11].

Overall, it is apparent that AI tools are becoming an integral part of everyday life. Recent studies indicate that this will influence creativity and teamwork. As a result, this would change the path of innovation in both technical and artistic domains. Understanding this yet unclear impact can, therefore, help to benefit from the development and be prepared for potential downsides or pitfalls.

3 Method

We conducted two user studies to investigate the effects of AI tools. The within-group lab study *Study 1* investigated the effect of AI tools on the collaborative process, while *Study 2* was an online study that investigated the effect of involving AI tools on how external raters perceive the results.

3.1 Study 1: Lab Study

Participants were organized into groups of three using convenience sampling in a university context. They provided informed consent and were not compensated for their participation. The study was conducted in English, which all participants spoke fluently. We avoided the term "AI" in the study to reduce potential biases.

Participants were tasked to ideate marketing campaigns for fictitious products. For this, they were asked to (1) name the product, (2) create a slogan, (3) think of 2–3 core selling points, and (4) physically sketch the product and a logo using pen and paper. During the study, we varied the Use of AI. In the *AI* condition, participants had access to ChatGPT-4o. In the *No AI* condition, they had no access to AI tools, but to the Google search engine without AI functionality. The order of conditions and products was counterbalanced across 6 trials, ensuring that each combination was used once. Each of the two conditions was designed to take approximately 20 minutes. Sessions were captured on video.

During the study, participants sat together at a table with a mouse, keyboard, and a 55" screen (Fig. 1). On the screen, either ChatGPT or Google was already displayed. Participants first answered demographic questions, followed by a briefing on the conditions and tasks. Since we observed some confusion on how to solve the task during a pilot study, an exemplary solution that was not part of the study was shown for one minute and then removed. At the beginning of each condition, participants received a handout briefly specifying the made-up Campaign. Campaigns included the ideation of a "Glow-in-the-dark Umbrella" (*Glowing Umbrella*) and a "Smart Plant Pot" (*Smart Plant Pot*). The handout prespecified the product name and the four sub-tasks. The groups performed the tasks for the first Campaign using a structured worksheet and filled out a post-condition questionnaire. This was repeated for the other condition, followed by a final questionnaire. We counterbalanced Campaign and Use of AI.

In our questionnaires, general questions covered demographics, familiarity with AI tools, creative background, and attitudes toward collaborative work. The condition-specific questionnaire addressed collaboration dynamics, creativity perception, rating of the solution, and cognitive load, and gathered open-ended feedback. Most questions were adapted from the literature: From the *Team Effectiveness Questionnaire* [1], we asked for *openness of communication, task understanding of team members, helpfulness of team members,* and *ability to resolve conflicts*. From the *Creative Product Semantic Scale* [3], we adapted questions regarding *originality, organization, practicability, predictability, appeal,* and *definition*. Furthermore, we used the *NASA Task Load Index* (NASA-TLX) to measure *cognitive effort, feeling of time pressure, performance satisfaction,* and *effort* [8]. In addition to the adapted questions, we measured preferences for product and AI use, perceived creativity, collaboration quality, and the perceived role of AI as a teammate, guide, or leader, concluding with general remarks. In the literature, AI tools were perceived as a teammate [10] or a teacher [11]. Since our study does not have an educational context, we split this second role into the more abstract concepts of guide and leader when asking for what role the AI took in their ideation process.

18 people (9 male, 9 female) aged 20 to 29 years (mean = 25.6, SD = 2.7) participated in Study 1. Computer science was the most common professional background, with a high representation of STEM fields. 8 engaged in creative activities like painting, writing, or designing once a week or more, another 8 at least once a month, and 2 never. Half of them had experienced creative group activities like architectural projects or jam sessions before. All participants had used AI tools before, with ChatGPT being the most prominent. 7 reported using AI tools daily, 5 weekly, and the remaining 6 less than weekly. The primary reasons for using AI were productivity and hobbies: 14 mentioned educational purposes, 13 work-related tasks, 12 personal projects, and 7 used it for entertainment. On a scale from 1 to 5, participants rated their familiarity with their group members 2.4 on average.

3.2 Study 2: Online Study

We conducted an additional online survey in which participants rated the results of **Study 1** without knowing whether AI was used or not. Participants provided their informed consent and were guided through two sections of questions. For each Campaign, they rated all creative results from all groups first, using the same Creative Perception questions as in Study 1. Then, they were asked to rank the results on their preference. The orders of Campaigns and the results from Study 1 were randomized.

20 people (7 male, 13 female) aged 18 to 53 years (mean = 27.55, SD = 8.09) participated in Study 2. 13 had a technical background

like computer science or medicine, and 3 had a creative background like architecture or design.

4 Results

In the following, we report the questionnaire results of *Studies 1 and 2* and analyze them for significance. Afterward, we report and interpret our coded observations from *Study 1*.

4.1 Questionnaire Results

In **Study 1**, we analyzed the ratings from the questionnaire using a Wilcoxon Signed-Rank test. The test revealed only a significant effect of Use of AI on *cognitive effort* ($Z = -3.18$, $p \leq 0.01$) for which *AI* was less mentally demanding (mean = −0.56, SD = 0.78) than *No AI* (mean = 0.33, SD = 0.84). No other significant effects were found for questions only asked in Study 1. All questionnaire ratings can be found in Figure 2 and an additional overview in Figure 4 in Appendix B.

Which campaign our participants preferred was split almost evenly. 7 participants preferred *AI*, 4 *No AI*, while the remaining 7 had no clear preference. Common written justifications for *AI* were that it was easier to complete the task, with some mentioning that GenAI helped with inspiration and made generating product names and slogans more efficient. A few participants highlighted that it allowed them to think beyond their usual ideas. For *No AI*, participants commonly reported that brainstorming was more fun, allowing one to think outside the box and feel more personally involved in the creative process. Some also wrote that the *AI* condition reduced creativity. Most of the participants felt like the group produced more creative results when using *No AI*, while only 4 felt that their AI-assisted results were more creative. We were also interested in how participants perceived the role of the AI tool. Picking from three options, most participants perceived it as a guide (12), some as a teammate (5), and only 1 as a leader. The creations of our participants can be found in Appendix A.

In **Study 2**, we used a non-parametric analysis of variance based on Aligned Rank Transform for testing significance and a Wilcoxon Signed-Rank test for post-hoc analysis (Holm-corrected). We found an effect of Use of AI ($F_{1,57}=5.43$, $p \leq 0.05$) and an interaction effect of Campaign and Use of AI ($F_{1,57}=20.45$, $p \leq 0.001$) on how *Organized* the result was perceived. The post-hoc test revealed that *Smart Plant Pot×AI* was significantly more organized than *Smart Plant Pot×No AI* and *Glowing Umbrella×AI* ($p \leq 0.05$). We also found an interaction effect of Use of AI and Campaign on *Practicability* ($F_{1,57}=4.8$, $p \leq 0.05$) and *Appeal* ($F_{1,57}=10.12$, $p \leq 0.01$). The post-hoc test only showed higher ratings for the *Smart Plant Pot* for *AI* in comparison to *No AI* ($p \leq 0.05$). For *focus*, we found a significant effect of Use of AI ($F_{1,57}=4.38$, $p \leq 0.05$) and interaction effects of Use of AI and Campaign ($F_{1,57}=7.47$, $p \leq 0.01$), meaning that *AI* results were perceived as significantly more well-defined. The post-hoc analysis showed that *Smart Plant Pot×AI* was significantly more focused than *Glowing Umbrella×AI* and *Smart Plant Pot×No AI* ($p \leq 0.05$). The results of the questions asked in both user studies are compared in Figure 2.

We also asked participants to rank the results of both campaigns (Fig. 3).

Overall, the *AI* results were rated and ranked slightly better than the *No AI* results.

4.2 Observations

We analyzed the recordings of group interactions in Study 1 using reflexive thematic analysis (RTA) with one coding author [4]. We grouped our observations into three clusters: *AI-Related*, *Interaction-Related* and *Tool-Related*. In the following, we will report observations and discuss them directly to enhance readability. When quoting participants, we use a number to identify the group and a letter to identify a person in the group. For example, **(3,Z)** identifies the rightmost participant of group 3.

4.2.1 AI-Related Observations. We observed participants frequently *"Suggesting to Prompt AI"*. Typically, this was followed by actually prompting the AI. This occurred multiple times per group in *AI* conditions, and many groups suggested prompting it almost instantly:

> **(6,Y)**: "Maybe the slogan could be like, 'Glow and Go'."
> *(Laughter among the group.)*
> **(6,Y)**: "Or we can ask ChatGPT for a catchy slogan."

Especially during the second treatments, groups were quick to prompt, typically 10 to 20 seconds into the session. This suggests that groups might often rely on AI to generate initial ideas, in many cases already before starting to ideate without its support. Users might view AI as the first step to idea generation when it is available, especially when they start to repeat tasks.

We observed that participants portrayed more instances of *"Liking AI Output"* than *"Disliking AI Output"*. At the same time, *"Perceiving Limitations of AI"* was observed in most groups. Participants criticized outputs as being generic, inaccurate, or requiring significant revision.

> *(The group is looking at an AI-generated image.)*
> **(4,Y)** *(sarcastically)*: "Well, that is definitely interesting."
> **(4,X)**: "I think we can just do it better."
> **(4,X and Z)**: "Yeah."

AI output seems to be perceived as rather useful, or at least satisfactory. However, while AI is appreciated, it is not always seen as producing good or relevant suggestions.

We frequently observed *"Selective Adoption of AI Suggestions"*. This refers to behaviors where the output of the AI was neither rejected nor adopted completely. Instead, participants chose specific outputs to refine, modify, or combine with their own ideas. In some cases, multiple ideas were combined into a new one.

> *(The group is discussing a list of AI-generated product names for their Smart Plant Pot, such as PotPal, SmartSprout, and Planta.)*
> **(1,Z)**: "How about PlantPal?"

This indicates that participants reflect and build on AI-generated suggestions, and perceive them to require human judgment.

While all groups used AI to produce text, most groups also used AI for *Generating Images*, with most generating at least five images per session. This suggests that participants might have found AI valuable for visual tasks, likely due to the speed and ease of generating multiple iterations compared to drawing them by hand.

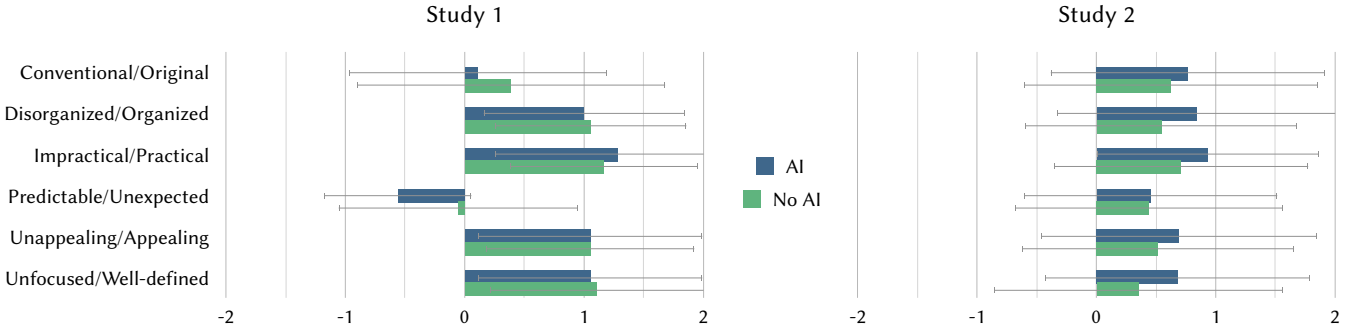


Figure 2: Ratings for a subset of the *Creative Product Semantic Scale*, measured in both user studies. −2 and 2 denote the left and the right property, respectively. Whiskers denote standard deviation. *Study 1*: Self ratings, *Study 2*: External ratings. Most ratings were slightly more positive in *Study 2*.

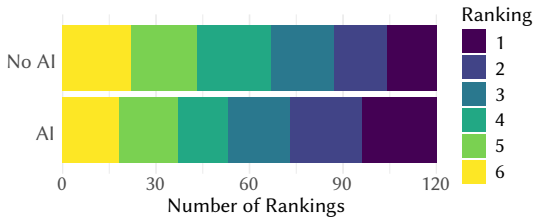


Figure 3: Frequencies of *AI* and *No AI* per rank, 1 being the best rank. For this, 20 externals ranked the 6 results per campaign from Study 1. *AI* results were ranked slightly better.

In one case, a participant expressed being overwhelmed by the amount of AI-generated suggestions, indicating *Information Overload (AI)*.

> *(The group is looking at an AI-generated text.)*
> **(3,Y)**: "It's so much that it's too hard to decide."

A group also felt like the AI tool made it harder for them to be creative.

> **(1,Y)**: "The moment you're given some kind of tools, your brain shuts down and says, 'I'm gonna use the tools.' But the moment you have no possibility to use the tools, it's like your potential comes out more."

This indicates that users might feel like they are getting restricted by the possibility of using AI tools, even though they are not forced to use them, which may result in them not being satisfied.

4.2.2 Interaction-Related Observations. This cluster describes differences in how participants engaged with the tasks across both Use of AI conditions, and it investigates how the availability and use of AI impact interactions between group members. In RTA, occurrence frequencies are typically not considered [4]. However, as we conducted a within-group experiment and observed notable differences, we report tendencies to characterize group behavior differences between the two conditions.

One of the most noticeable differences was the decline in the group's *"Discussing Product Details"* when AI was available. In the *No AI* condition, participants often debated the specifics of their product, i.e., what it does and how it works, but also why it would appeal to consumers. This often leads to them refining their idea. For example, participants shared more of their own knowledge and perspectives.

> *(Explaining to group members the concept of botanical self-priming and having an irrigation system.)*
> **(5,Z)**: "It analyzes the moisture of the water, and based on that, it can actually kind of like predict how much water it needs."

However, in the *AI* condition, such discussions were four times less common. This suggests that when AI is available, users are less likely to discuss their own ideas and knowledge background in depth. This could be due to groups relying on AI-generated ideas for discussion rather than refining their own ideas and sharing individual experiences.

In addition, for naming and slogan tasks, a large difference between conditions occurred for participants' *"Proposing a New Idea"*, which was nearly three times more frequent in the *No AI* condition.

> *(The group is trying to create a slogan in the No AI condition.)*
> **(1,Y)**: "Hello little fella, grow with the Funbrella."
> *(Demonstrating rhythm)*: "It goes up, down, up, down."

A member of another group later noted:

> **(2,Z)**: I felt that my teammates were relying too much on GPT. They only chose between the given options and did not consider ideas it did not generate, even when asking them specifically for other ideas outside ChatGPT.

This suggests that with AI, participants may engage less actively in generating or exposing their own ideas in tasks that require creativity and linguistic play, such as rhyming, wordplay, or cultural references. Participants may perceive this as more engaging or intuitive when done by themselves. Even when a single group member tried to actively steer the discussion away from depending on AI-generated inspiration, they did not succeed.

Participants in the *No AI* condition demonstrated *"Critical Discussion"* and *"Concept Clarification"* in twice as many cases. The first behavior describes situations in which an idea or statement was critically discussed or commented by another team member.

The second behavior describes a participant further evaluating a suggestion to their team members.

> *(Group thinking of product name for the glow-in-the-dark umbrella.)*
> **(1,X)**: "Maybe like, LumBrella."
> **(1,Y)**: "I don't think anyone would... If you say something like GlowBrella, people would get what you mean with it. But LumBrella, people would be like, 'What are you talking about?' "

Additionally, the behavior of *"Suggesting What To Write"* was observed three times more often when there was no AI available.

> *(Participant is writing down selling points.)*
> **(6,Y)**: "You can write down 'manageable via app'."

This indicates that group members might reflect more deeply on ideas made by others and spend more effort on conveying their ideas when no AI tool is involved in the process.

In addition, extended periods of "Silence" were three times more common in the *No AI* condition. This might be an indicator for individuals thinking more deeply when there is no AI involved. It could also be possible that participants just zoned out, but the overall behavior does not point toward that interpretation.

Participants demonstrated several instances of *"Parallel Working"*, in which group members worked simultaneously on separate sub-tasks. This was observed approximately twice as often in the *AI* as in the *No AI* condition. By splitting tasks, group engagement was reduced, as described previously. However, this behavior could also increase efficiency.

Overall, these observations suggest that AI availability has a strong influence on group collaboration dynamics. It seems to reduce deep thinking, effort put into conveying one's own ideas, and critically reflecting on others' ideas. Participants seem to reduce interaction and prefer a higher degree of parallelization, which might make groups more efficient but could undermine the benefits of teamwork.

We later asked participants to compare both conditions. The process without AI access was typically considered harder but also more independent, more creative, and less distracting. Having teammates *"to bounce off of"* (1,Y) was often perceived as beneficial. Participants felt like they could *"streamline a single idea until it became better"* (3,X).

> **(5,Z)**: (*No AI*) made us think for ourselves rather than rely on a finished result from an AI model. Also, there was more collaboration.

On the other hand, some also mentioned that using AI made them more original. Having access to the AI tool was typically considered easier and quicker, yet less fun, less engaging, and less creative:

> **(1,Y)**: "It feels like I was stripped away from my own originality and creativity due to the comfort of having ChatGPT at my disposal"

But, especially on naming tasks, the influence was perceived as helpful and inspiring, especially when encountering creative blocks:

> **(6,Z)**: "ChatGPT gives many options for you to choose from."
> **(4,Z)**: "Generating slogan and names worked well, (...) to help one come up with new directions if stuck."

These responses indicate that although the lack of AI increased task difficulty, it also fostered greater teamwork involvement and enhanced autonomous thinking.

4.2.3 Tool-Related Observations. Participants prompted AI almost twice as frequently as they conducted traditional internet searches in the other condition. Although internet searches were not used as often, it was used at least once in all the *No AI* sessions. This indicates that when AI was available, it played a major role in the ideation process.

Generating images with AI was heavily used by participants when working on the drawing task, occurring roughly twice as frequently as traditional image searches in the *No AI* condition. All groups consistently generated multiple AI-produced visuals until they were satisfied with the output. They then tried to transfer this result to their drawing. Interestingly, this suggests that while for text work, users tend to ideate on initial AI output manually, in visual work, they tend to adjust AI output iteratively until they are satisfied, then take the last iteration as the result.

5 Overall Discussion

Our findings contribute to understanding the impact of GenAI on creative group contexts. The impact is ambiguous and not purely positive or negative, but certainly notable. We did not find significant differences in how users themselves perceive creative results with or without the assistance of GenAI. In other studies, AI was seen as a teammate [14], while in our study most participants perceived it as a guide. Our observations indicate that users perceive AI tools as helpful when facing creative blocks, supporting findings by Jansen and Sklar [10]. Our study highlighted a significantly lower mental load during AI-assisted processes, consistent with literature findings showing that AI tools can streamline certain creative stages and repetitive tasks [9].

Interestingly, participants showed a preference towards *No AI* contexts, perceiving themselves as more creative when they had full control over their ideation, which is in line with findings that AI can sometimes reduce exploration of personal creativity [14]. In addition, we observed higher levels of collaboration in the *No AI* settings, where participants more actively engaged in idea sharing and discussions—behaviors that are important to foster social creativity [17].

The fact that externals rated AI-assisted creativity slightly better supports results from a study by Kim et al. [11], which noted that AI-assisted outcomes can be perceived as more creative and diverse.

This answers our research questions RQ1–4: GenAI tools seem to reduce the social interaction and influence of personal contributions. In our setup, teams tend to prompt AI directly at the beginning, especially when repeating tasks. The tool is primarily perceived as a guide and is used intensively. We did not measure a significant change in how groups perceived their results, but more than half of the participants felt more creative without AI. When significant effects were found, externals perceived AI-assisted work as more defined, and they also ranked it slightly better.

Based on our results, we propose that groups should avoid instantly using GenAI for inspiration before ideating without it, as the temptation to use AI when it is available should not be underestimated. Teams should keep in mind that using AI tools notably

reduces idea exchange and how often individuals relate to their personal, unique experiences. Some participants even felt like their own ideas were buried under AI suggestions, which could also decrease motivation and make the process less fulfilling. Therefore, using AI for early ideation can hinder creatives from taking advantage of their unique life experiences and thus achieving results that stick out. Deliberately limiting AI access might support divergent thinking and increase motivation. Participants were not forced to use AI in any way, but they used it intensively, while most still preferred the process in which they had no access to it.

On the other hand, participants' perception of their mental load was significantly lower, and the creative results were ranked slightly better by externals. When being stuck, some considered AI to be helpful in overcoming blockades. Participants also tended to critically reflect on AI ideas and recombine them into something new.

Overall, our findings underscore the dual nature of the impact AI has on group creativity. They suggest that AI can best be used to make things quick and comfortable or to overcome blockades, while users should hesitate using AI when individual perspectives, critical reflection, exchange of ideas, and a sense of personal achievement are the goal.

6 Limitations

Our findings from *Study 1* relate to a sample set of comparably young adults with a technical and academic background who had high experience using GenAI tools. They were also not used to the creative task they had to perform in the study, and some reported feeling time pressure during the study, which may mean that our findings transfer better to productivity-related settings than to creative hobbies. While we found many non-significant results in the online study, we believe our results may become clearer and new tendencies surface when recruiting more expert external raters in follow-up user studies. Furthermore, our second study featured a more diverse age distribution, but again, a rather academic and technical sample of participants.

7 Future Work

The impact of AI on creative processes is notable but needs to be differentiated. For this, additional in-depth research is needed. Promising next steps are to compare how similar effects can be observed with individual participants and to investigate a wider range of creative tasks. It is important to note that we investigated result-driven team tasks, but not groups being creative for the experience itself. We expect that the impact will be even more noticeable here, as communication was clearly reduced by AI involvement. An interesting focus would be to more explicitly differentiate between groups producing acceptable results, and fostering meaningful creative engagement and exceptional innovation. We also found hints that visual and textual tasks might be approached rather differently by users of generative AI. Investigating this as a condition for future studies could differentiate those domains more clearly. Based on the comments of participants, we theorize that the timing and detail level of AI involvement are very relevant. Only prompting AI tools when creative ideation comes to a halt or keeping generated output less concrete may let us get the best of both worlds.

8 Conclusion

Our goal was to investigate how access to generative AI tools changes the way collocated groups collaborate in creative processes. We also wanted to find out if this affects how groups perceive their results, and how these results are perceived by others. To that end, we conducted a laboratory study with six groups of three. The groups performed two similar creative marketing tasks, one with access to ChatGPT and one with access to the Google search engine.

Our observations suggest that participants felt like it was easier to work with GenAI access, but they also collaborated notably less and felt less creative. Some considered GenAI helpful in providing inspiration to overcome creative blockades and accelerate idea generation. Others felt restricted in their creative autonomy. The AI tool was primarily perceived as having a guiding role, rather than being a leader or a teammate. We performed a second study to find out if AI is perceived differently by external raters, without knowledge of AI involvement. These creativity ratings had a tendency to be higher overall for products of sessions where AI was involved.

Acknowledgments

We want to thank Sofie van Anrooij for illustrating Figure 1. Additionally, we thank Kristina Hörrmann, Lea Schirp and Sarah Sahabi for proofreading versions of this paper. This work was funded in part by the German B-IT Foundation.

References

[1] Stephanie Adams. 2002. A Pilot Study of the Performance of Student Teams in Engineering Education. In *Proceedings of the 2002 American Society for Engineering Education Annual Conference & Exposition*. American Society for Engineering Education, Montreal, Canada, 13 pages. doi:10.18260/1-2--10054 https://peer.asee.org/10054.

[2] Ajay Bandi, Pydi Venkata Satya Ramesh Adapa, and Yudu Eswar Vinay Pratap Kumar Kuchi. 2023. The Power of Generative AI: A Review of Requirements, Models, Input–Output Formats, Evaluation Metrics, and Challenges. *Future Internet* 15, 8 (2023), 260.

[3] Susan Besemer and Karen O'Quin. 1986. Analyzing Creative Products: Refinement and Test of a Judging Instrument. *The Journal of Creative Behavior* 20, 2 (1986), 115–126. doi:10.1002/j.2162-6057.1986.tb00426.x

[4] Virginia Braun and Victoria Clarke. 2006. Using Thematic Analysis in Psychology. *Qualitative Research in Psychology* 3, 2 (2006), 77–101.

[5] Pei Chen, Jiayi Yao, Zhuoyi Cheng, Yichen Cai, Jiayang Li, Weitao You, and Lingyun Sun. 2025. CoExploreDS: Framing and Advancing Collaborative Design Space Exploration Between Human and AI. In *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems (CHI '25)*. Association for Computing Machinery, New York, NY, USA, Article 22, 20 pages. doi:10.1145/3706598.3713869

[6] Stefan Feuerriegel, Jochen Hartmann, Christian Janiesch, and Patrick Zschech. 2024. Generative AI. *Business & Information Systems Engineering* 66, 1 (2024), 111–126.

[7] Gerhard Fischer, Elisa Giaccardi, Hal Eden, Masanori Sugimoto, and Yunwen Ye. 2005. Beyond binary choices: Integrating individual and social creativity. *International Journal of Human-Computer Studies* 63, 4 (2005), 482–512. doi:10.1016/j.ijhcs.2005.04.014 Computer support for creativity.

[8] Sandra G. Hart. 2006. Nasa-Task Load Index (NASA-TLX); 20 Years Later. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* 50, 9 (2006), 904–908. doi:10.1177/154193120605000909

[9] Angel Hsing-Chi Hwang. 2022. Too Late to be Creative? AI-Empowered Tools in Creative Processes. In *Extended Abstracts of the 2022 CHI Conference on Human Factors in Computing Systems* (New Orleans, LA, USA) *(CHI EA '22)*. Association for Computing Machinery, New York, NY, USA, Article 38, 9 pages. doi:10.1145/3491101.3503549

[10] Chipp Jansen and Elizabeth Sklar. 2021. Exploring Co-creative Drawing Workflows. *Frontiers in Robotics and AI* 8 (2021), 577770. doi:10.3389/frobt.2021.577770

[11] Han Kyul Kim, Aleyeh Roknaldin, Shriniwas Prakash Nayak, Xiaoci Zhang, Muyao Yang, Marlon Twyman, Angel Hsing-Chi Hwang, and Stephen Lu. 2024. ChatGPT and Me: Collaborative Creativity in a Group Brainstorming with Generative AI. In *2024 ASEE Annual Conference & Exposition*. ASEE Conferences, Portland, Oregon, 13 pages. doi:10.18260/1-2--48457 https://peer.asee.org/48457.

[12] Harsh Kumar, Jonathan Vincentius, Ewan Jordan, and Ashton Anderson. 2025. Human Creativity in the Age of LLMs: Randomized Experiments on Divergent and Convergent Thinking. In *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems (CHI '25)*. Association for Computing Machinery, New York, NY, USA, Article 23, 18 pages. doi:10.1145/3706598.3714198

[13] Timothy Scott Larey. 1994. *Convergent and Divergent Thinking, Group Composition, and Creativity in Brainstorming Groups.* Ph. D. Dissertation. The University of Texas at Arlington.

[14] Yingyue Luna Luan. 2024. *The New Creative Alliance: Investigating the Dynamics of Human-AI Collaboration in Creative Endeavours.* Ph. D. Dissertation. University of Cambridge.

[15] Bernard A. Nijstad. 2015. Creativity in Groups. In *APA Handbook of Personality and Social Psychology, Vol. 2: Group Processes*, Mario Mikulincer, Phillip R. Shaver, John F. Dovidio, and Jeffry A. Simpson (Eds.). American Psychological Association, Washington, DC, US, 35–65. doi:10.1037/14342-002

[16] Bernard A Nijstad and Wolfgang Stroebe. 2006. How the group affects the mind: A cognitive model of idea generation in groups. *Personality and social psychology review* 10, 3 (2006), 186–213.

[17] Paul B. Paulus and Mary Dzindolet. 2008. Social influence, creativity and innovation. *Social Influence* 3, 4 (2008), 228 – 247. doi:10.1080/15534510802341082 Cited by: 93.

[18] Leonie Polster, Volker Bilgram, and Sarah Gortz. 2024. AI-Augmented Design Thinking: Potentials, Challenges, and Mitigation Strategies of Integrating Artificial Intelligence in Human-Centered Innovation Processes. *IEEE Engineering Management Review* PP (2024), 1–36. doi:10.1109/EMR.2024.3512866

[19] Paul Miles Preuschoff, Sarah Sahabi, René Schäfer, Lea Emilia Schirp, Marcel Lahaye, and Jan Borchers. 2025. Groups vs. Booking Websites: Investigating Collaborative Strategies Against Deceptive Patterns. In *Proceedings of the Extended Abstracts of the CHI Conference on Human Factors in Computing Systems (CHI EA '25)*. Association for Computing Machinery, New York, NY, USA, Article 311, 9 pages. doi:10.1145/3706599.3720225

[20] Peinuan Qin, Chi-Lan Yang, Jingshu Li, Jing Wen, and Yi-Chieh Lee. 2025. Timing Matters: How Using LLMs at Different Timings Influences Writers' Perceptions and Ideation Outcomes in AI-Assisted Ideation. In *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems (CHI '25)*. Association for Computing Machinery, New York, NY, USA, Article 25, 16 pages. doi:10.1145/3706598.3713146

[21] R. Keith Sawyer. 2006. Group creativity: musical performance and collaboration. *Psychology of Music* 34, 2 (2006), 148–165. doi:10.1177/0305735606061850

[22] Xiaotong (Tone) Xu, Arina Konnova, Bianca Gao, Cindy Peng, Dave Vo, and Steven P. Dow. 2025. Productive vs. Reflective: How Different Ways of Integrating AI into Design Workflows Affect Cognition and Motivation. In *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems (CHI '25)*. Association for Computing Machinery, New York, NY, USA, Article 24, 15 pages. doi:10.1145/3706598.3713649

[23] I Made Marthana Yusa, Yu Yu, and Tetiana Sovhyra. 2022. Reflections on the use of artificial intelligence in works of art. *Journal of Aesthetics, Design, and Art Management* 2, 2 (2022), 152–167.

[24] Zheng Zhang, Weirui Peng, Xinyue Chen, Luke Cao, and Toby Jia-Jun Li. 2025. LADICA: A Large Shared Display Interface for Generative AI Cognitive Assistance in Co-located Team Collaboration. In *Proceedings of the 2025 CHI Conference on Human Factors in Computing Systems (CHI '25)*. Association for Computing Machinery, New York, NY, USA, Article 147, 22 pages. doi:10.1145/3706598.3713289

[25] Leah Zhang-Kennedy, Maxwell Keleher, and Michaela Valiquette. 2024. Navigating the Gray: Design Practitioners' Perceptions Toward the Implementation of Privacy Dark Patterns. *Proc. ACM Hum.-Comput. Interact.* 8, CSCW1, Article 97 (2024), 26 pages. doi:10.1145/3637374

A Appendix: User Creations

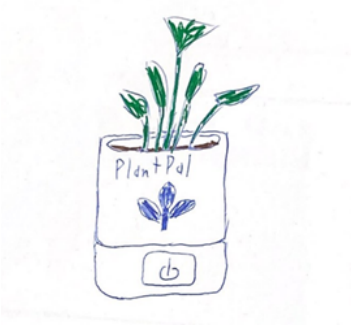
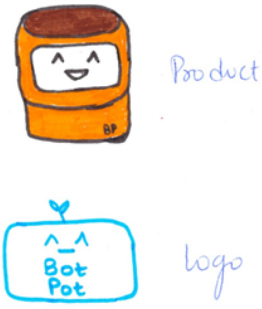
Glow-in-the-Dark Umbrella (Creative Results)

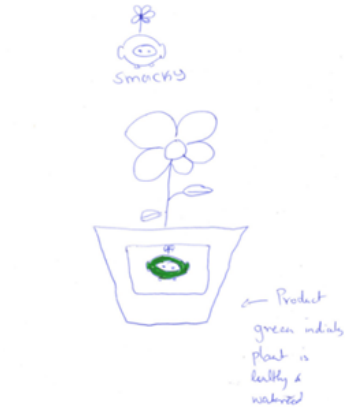
Group 01 **(AI)**	Funbrella	Hey little fella, grab a Funbrella!	1. Safety for kids on the way to school and back. 2. Fun colors and designs; your kid will remember to take it! 3. Eco-friendly!	
Group 02 **(no AI)**	Lumibrella	Rain won't dull you when you shine	1. Safer night time walk. 2. It lights you up in bad weather. 3. Eco-friendly glow technology.	

Group 03 **(no AI)**	Starella	When Rain Meets Radiance	1. Safety. 2. Personlization. 3. Solar - energy use => Eco-friendly product	
Group 04 **(AI)**	Luminella	See and be seen!	1. Fashionable accessory (fun color options). 2. Increased traffic safety for pedestrians.	

Group 05 **(no AI)**	Starella	Let the night shine on you!	1. Custom glow designs: Choose from multiple personalized glowing patterns. 2. Solar powered glow: Self-sustained eco-friendly power charging. 3. Rain activated sensors: Intensify the glow during rain, creating dazzling, practical light displays.	
Group 06 **(no AI)**	Lumbrella	Just Glow	1. Lightweight. 2. Stormproof. 3. Luminescent.	

Smart Plant Pot (Creative Results)

Group 01 **(no AI)**	Plant Pal	Grow smarter, not harder	1. Ideal for budget conscious and beginner plant parents. 2. App notifications - never forget watering your plants again. 3. Comes with sensors for all kinds of plants.	
Group 02 **(AI)**	BotPot	Your green-thumbed pot	1. Cute digital plant pot. 2. No expertise needed. 3. Track your plant's health.	

Group 03 **(AI)**	Smacky	Smacky - compliment your green friends!	1. Smart - takes care if you forget. 2. Suitable for every plant. 3. Saves water and energy.	
Group 04 **(no AI)**	BotaniQ	BotaniQ: The Smart Way to a Greener Thumb!	1. Controllable with an App. 2. Registers overwatering/dryness/ sun exposure (with a self-watering setting). 3. Solar-powered.	

Group 05 **(AI)**	Piezo Plant Pot	The sound of nature - in your home.	1. Ai drived irrigation system. 2. Real-time ambient sound generation using piezo sensor technology. 3. Customizable sound experience.	
Group 06 **(AI)**	Smartpot	Be sprouty	1. Powered by solar power. 2. Managable by app. 3. Individual/customized plan for plant.	

B Appendix: Questionnaire Ratings (Study 1)

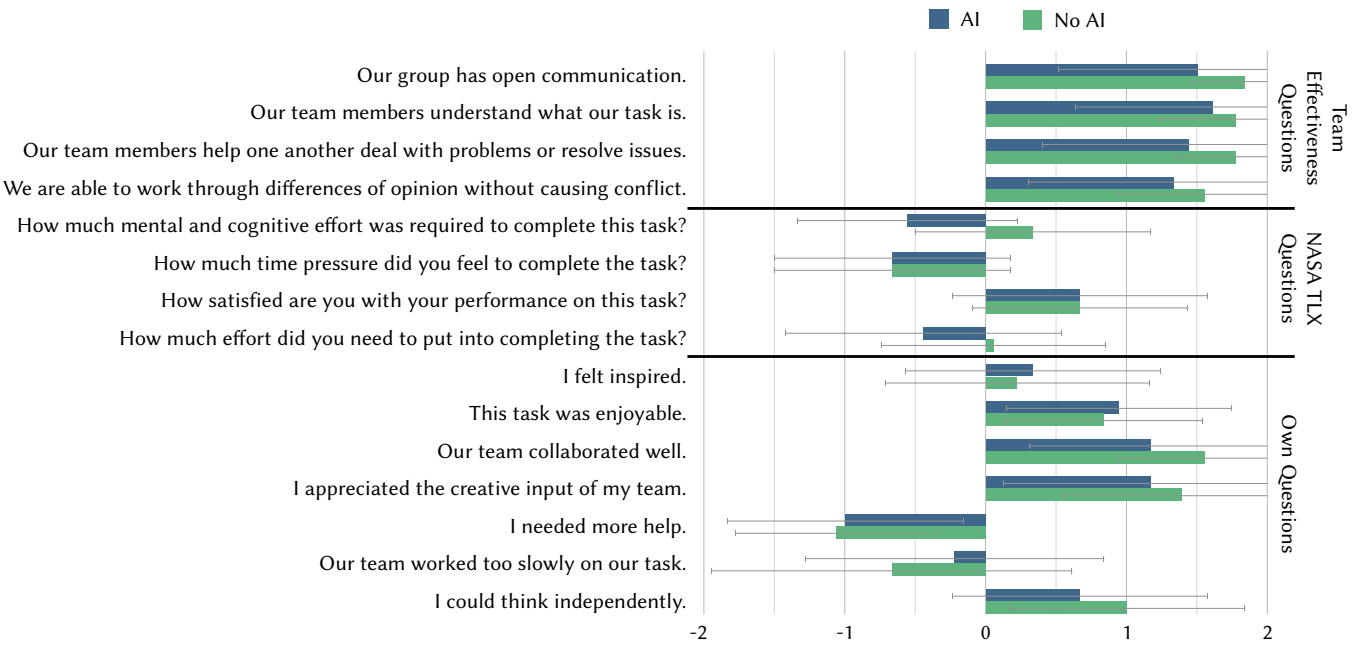


Figure 4: Subjective user ratings from Study 1 for team effectiveness, task load, perceived creativity, and collaboration quality on a scale from -2 (disagree/the least) to 2 (agree/the most). The error bars denote standard deviation. Except for *cognitive effort* the use of AI did not significantly impact those ratings.