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## **Analysis of the Refinement Stage in the Implementation of a Group Project by Primary School Second-Graders**

### **Abstract**

This paper describes the Phase II results of qualitative research involving design teams of primary school second-graders divided as follows: designers (D) – the creators of a solution; clients (C) and executors (E) – helping to improve the project. The study aimed to observe and describe what questions and feedback stimulated new idea generation to improve the initial solution, addressing the following research question: *What does a constructive dialogue between peers look like when developing a group project?* The adopted research approach was based on educational team design (the case study method). Based on observations and peer conversations, the authors determined the conditions that facilitated constructive dialogue, and those that hindered the accomplishment of the group work in question.

**Keywords:** *children's group project, constructive dialogue, feedback, idea generation*

### **Introduction**

A constructivist approach that encourages pupil engagement, including learning by solving problems that align with children's interests, has long been promoted in early school education. This approach emphasises the relevance of dealing with tasks, reaching a consensus, and sharing knowledge among peers. The teacher's primary responsibility is to organise a learning environment in

which pupils can investigate, inquire, invent solutions, and make mistakes – and learn through them by drawing conclusions independently (Davies et al., 2013). The authors of this paper believe that offering group project tasks to the youngest learners is a teaching method insufficiently exploited in early school education in Poland. With this in mind, children in the study were given the creative group task of designing their dream playground. The authors analysed the resulting work and conversations during the implementation of the project.

Previous studies (Schut et al., 2019; 2022) indicate that dialogues between peers are not always constructive, i.e., they do not always facilitate the generation of new ideas. Psychological analyses have shown that resistance often emerges when there is encouragement to improve the product of a given group project, the signs of which include describing the product rather than reflecting on it and trying to enhance it (Cummings et al., 2015; Schut et al., 2019). Importantly, peer feedback is received particularly negatively by team members, mostly rejected or ignored (Schut et al., 2019). Therefore, examining what causes the change in negative attitudes towards peer comments is vital. The authors intended to establish how taking the roles of clients (C) – those who will use the designed solution – and executors (E) – those who will put the design into practice, can trigger a positive response from the designers (D) and consequently improve the main product of the project.

## **Research Background**

The research was based on the assumption that many phenomena occur during the process of idea generation in the course of implementing a group project, including resistance to thinking of new ideas when non-constructive dialogues take place or ideas are criticised by peers (Luo, 2015; Schut et al., 2019). It was relevant to observe under which conditions constructive and destructive dialogues for idea generation occur between peers. The dual-process theories of creative cognition were the theoretical basis for tracking convergent and divergent thinking processes (Sowden et al., 2015).

There are a limited number of studies on children's group project teams, and the existing ones that analyse design teams made up of pupils aged eight to twelve (Van Mechelen, 2016; Schut et al., 2019; 2022) focus on the process of constructive (pre-planned) feedback by teachers using the principles of dual-process theories of creative cognition. A literature review reveals a need for further research (especially qualitative) to conduct an in-depth analysis and interpretation of data from observations of creative activities performed in schools. This need is all the more pronounced because the method of group

project design is employed so rarely in early school education in Poland that the authors were unable to find a single example of a study similar to the one presented here.

Qualitative research conducted for the initial stage of education in Polish schools enables the authors to understand which types of feedback as part of dialogues between teams can stimulate further idea generation. So far, it has been established which types of feedback help produce initial ideas when working on a group project during Phase I (Bonar & Zbróg, 2023). The authors now present the study's results addressing the following question: *What does constructive dialogue between peers look like during the development of a group project?* (Phase II). Addressing this question created an opportunity to fill the gap in pedagogical knowledge of the context for improving original products in group projects, thereby enabling recommendations for educational practice in early school education to be made.

## **Research Methodology**

### **Research Sample**

The study involved six groups of second-graders (approximately eight years old) attending primary schools in two Polish cities (Kielce and Łódź). The authors are in regular touch with these schools as part of a student internship programme for future teachers. Thus, the selected groups of pupils represent convenience sampling (Saumure & Given, 2008), a commonly applied solution in qualitative research, where the aim of the analysis is not to generalise but to understand, as was the case in the research in question. Given its purpose and research question, geographical diversity is irrelevant to this study (McKenney & Reeves, 2018).

### **The Researcher's Role**

The design teams worked in the school's so-called common rooms (where children participate in after-school activities to develop their interests, for instance) under the supervision of their teachers, who recorded the children's interactions while producing ideas. The entire feedback process occurred naturally, without interference from the study's authors.

## **Ethical Considerations**

The principal, the teachers, and the parents of the pupils were informed of the purpose of the study, its stages and how the transcription data would be used.

Written consent was obtained from parents so that their children could participate in the study. Children volunteered for the project and were informed they could withdraw anytime. The research project received favourable feedback from the Research Ethics Committee operating at the Faculty of Education and Psychology at the Jan Kochanowski University in Kielce (no. 10/2023).

## **Instruments and Procedures**

The task, which created the opportunity to observe the children during group work, was related to solving an open-ended problem for which there was no single correct solution. A methodological approach was developed for educational design research, where case studies were the primary method (Bakker, 2018). “Empirical inquiry is conducted in real learning settings – not laboratories – to craft effective solutions to the complex challenges facing educational practitioners. At the same time, the research is carefully structured to produce theoretical understanding that can serve the work of others” (McKenney & Reeves, 2019, p. 1).

The different phases of the project sessions had a structure typical of this type of research and already described in the literature (Van Mechelen et al., 2018; Schut et al., 2019; 2022; Bonar & Zbróg, 2023). This article focuses on the analysis of Phase II of the project, during which the four-person teams of designers continued their creative work on the playground. Next, pairs consisting of a client and an executor commented on the prototypes of the innovative equipment and asked questions to refine the ideas. Students were at liberty to provide different types of feedback.

## **Data Analysis**

All the sessions were recorded, and transcriptions of the group discussions that focused mainly on the feedback given by group members were made. Next, the data was analysed using the following procedure:

1. Transcripts were categorised into units of analysis: feedback from clients and executors and direct responses from designers were grouped into pairs (feedback-response). Both authors coded all feedback and response pairs of the entire dataset independently. Based on Schut et al. (2022, p. 112), the following types of feedback were identified: resistance responses, report-type responses, agreement-type responses, deep reasoning responses and ideation responses (generation of new ideas).
2. Selection and development of a coding framework (types of feedback) based on a model developed by the research team led by Alice Schut (2022, p. 111). Two levels of feedback were identified:

- low-level feedback (convergent thinking) divided into low-level questions and low-level comments;
  - high-level feedback (divergent thinking) divided into deep reasoning questions and generative design questions.
3. Identification and interpretation of patterns and formulation of conclusions.

## **Results**

As anticipated, Phase II of the research, which involved encouragement to produce new ideas and solutions, was more complex in terms of the types of feedback given and its impact on the continued generation of new ideas or correcting/improving those already created. Resistance to continue creative work was prevalent, stemming from the different types of feedback and determined by specific circumstances, as illustrated by the following two examples.

### **Example 1**

C: *We think that... we really like your slides and we'd really like to have one in real life.* [complimenting]

D: *We made this slide where you slide down into this sort of labyrinth room. It's this room that you can't get out of, because there are some mountains, trapdoors there.* [describing]

E: *And you really want something like that, guys? For real?* [unconstructive comment, questioning]

C: *Yeeeah, buuut... it's nothing to be happy about because you won't ever get out of it.* [denying]

E: *So maybe we should make one where there is an exit.* [encouraging]

D: *Maybe .... after 300 levels.* [reflecting on the previous idea]

C: *And what's that? Maybe it would be a good exit...* [asking about functionality; exploring new possibilities]

D: *It's a kind of swing.* [indicating]

C: *And what equipment is it?* [asking to verify]

D: *What equipment?* [ambiguity, asking for clarification]

C: *But what is our task? To make equipment that doesn't exist yet.* [defining]

C: *What does it swing on? What is this?* [asking how it works]

D: *It's this kind of swing where you walk and walk and...* [describing how it works]

E: *You exit ...* [proposal/generation of an idea; everyone is happy to come up with a solution together]

**Photo 1.** A slide (a collaborative effort)



Analysis of the types of feedback during the discussion shown in Example 1 leads the authors to conclude that the initial resistance responses (non-constructive comments), the display of doubts about the efficiency of the solution and, above all, the report type responses led to an agreement on the final solution as regards the functionality of the slide, through encouraging or asking questions about its features and operation. Children from each group (clients, designers, executors) showed interest in the actual refinement of the product and nurtured a will to cooperate to produce a solution. A very positive reaction was observed among all designers to the ideas and feedback from clients and executors. Everyone was pleased with the final result, which was further emphasised by the enthusiastic planning of the construction of a multi-level maze:

- Definitely not from plasticine, as that'd be hard to make.
- Tomorrow each of us will draw one level of the maze.

One can assume that the sense of togetherness during the design process counterbalanced the resistance responses thanks to the benevolent demeanour of all team members. There was clearly a high degree of willingness to collaborate and a shared effort to find a solution.

### **Example 2**

In Example 2, rather than collectively seeking solutions, the groups of clients and executors only gave unconstructive comments provoking resistance responses from the designers. Friendly encouragement for further development

and collaboration was replaced by criticism, uttered in an unpleasant, unhelpful tone, causing the designers to withdraw from any constructive discussion.

**Photo 2.** A twisted slide



D: *It's... actually I don't know yet... but I know it's going to be a slide.* [doubting]

E: *It's kinda tall, this slide.* [describing, scorn can be heard]

C: *And you won't fall off? Cause it's kinda twisted.* [clarifying question, scorn can be heard]

D: *It doesn't go like this, it goes like that* [showing]. *And there will be such a big* [high] *take-off at the top.* [explaining how it works]

C: *And you really wanna slide down this one? It seems, like, endless, you'd just keep sliding around...* [offensive question, doubting]

D: *It would only be like five kilometres.* [indicating physical properties of equipment]

C: *And d'you know how much five kilometres is? It's a lot. Would you like to keep spinning like that?* [disparaging, confrontational question, apparently unfriendly]

D: ... [silence]

C: *Good luck with that.* [unconstructive comment, mocking, sarcastic, unhelpful]

E: *There're lots of turns there. You would get dizzy with so many turns.* [describing; disparaging tone]

D: *But that's the point.* [confirmation; quiet, resigned, resentment can be heard]

E: *You've got lots of parts here. Tell me about it, 'cause I can see something black there.* [request]

C: *So there won't be any new equipment here?* [doubting]

D: *No, because you just slide there, because you go down and you jump off the ramp onto the other part of the slide, and then here, here, and here* [demonstrating; denial and clarification].



D: *Witek, don't tell them about this secret... this... ramp.* [deciding, commanding; competitive attitude]

D: *We will think more about how to fit it in...*[admitting that the problem with the “new equipment” has not been solved].

The designers' positive attitude towards constructive interaction was undermined by unkind and unconstructive comments, questioning the ideas they proposed (early in the discussion). Scornful, sarcastic and unkind remarks created an upsetting atmosphere, accentuating the confrontational approach from the groups of clients and executors. The designers tried to stay creative till the very end, but the unpleasant, fault-finding atmosphere did not foster the generation of new ideas.

The original ideas were not developed or improved because clients and executors focused on low-level questions. In response, the designers mainly employed resistance responses regarding generating further ideas (expressing doubts) and report-type responses (describing how something looks and works).

Importantly, low-level comments (complimenting), which significantly improve the process of new idea generation, as described in another article (Bonar & Zbróg, 2023), were missing. Complimenting was correlated with a low number of low-level questions (also in Example 1). Therefore, it can be inferred that complimenting triggers a shift to deep reasoning (divergent) questions, whereby it stimulates the production of generative design questions that help generate new ideas and explore new possibilities. The last part of the dialogue shows (high-level) deep reasoning when it is acknowledged that the problem has not been solved.

## **Discussion**

The study aimed to analyse the children's conversations on how to improve the initial design to determine which types of feedback facilitate the development of ideas. First of all, constructive dialogue during the analysis of Phase II of the research did not occur in every project team. Resistance and report-type responses were much more frequent than during the production of the original idea. Feedback indicative of (high-level) deep thinking was rare and less common than in the studies that inspired the research project described here (Schut et al., 2019; 2022). The explanation is rather apparent: while in Dutch schools, children are taught using the group project method from the first grade, and teachers have a wealth of supplementary resources at their disposal (also available online), the Polish pupils under study had no experience of group project work.



As shown by other studies (Crilly, 2015; Cummings et al., 2015; Schut et al., 2019), during Phase II, there was often an excessive fixation among the children on questions about details, which somehow blocked the production of new ideas. In this context, another observation is interesting: it appears that, irrespective of the resistance responses that emerged, the success of the project (in all six teams) was determined by the benevolent, collaborative atmosphere and a real sense of shared effort to complete the task.

New idea generation failed whenever there was a prevailing atmosphere of inequality between the designers and the confrontation-oriented<sup>1</sup> groups of clients and executors, who would make disparaging, sarcastic and confrontational remarks. Positively cooperative at first, the designers were incapable of coping with the destructive feedback and stopped producing new ideas, just as when, instead of cooperation, rivalry appeared, as typical in Polish schools.

## **Conclusions and Implications**

The part of the research presented here proves that the effective generation of new/further ideas in group projects occurs when all children focus on collaboration in a friendly atmosphere, bolstered by compliments, encouragement, and suggestions for new solutions. In this way, even if unconstructive comments or doubts arise among clients and executors, the whole project team tries refining the original idea and finding the best solutions (Example 1).

This conclusion can be sustained based on observations and analyses of the work done by the different teams where an imbalance between the different cooperating groups occurred. The designers' positive, cooperative attitude was insufficient to enable work on the project to continue (Example 2). Unkind comments from clients and executors, questioning the quality of the designers' ideas in a tone laced with sarcasm and scorn resulted in the termination of the project at Phase I. An unpleasant atmosphere reinforced by the fixation on low-level questions and lack of compliments for good solutions did not create favourable conditions for continuing work on the original design, thereby blocking the generation of new ideas.

The authors believe that, besides its theoretical value, the results of the research are useful for early school education teachers and educators working in common rooms, as they prove the importance of different types of feedback given to designers during idea generation and, above all confirm the signifi-

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<sup>1</sup> Importantly, the members of these groups were not instructed to adopt this attitude; it was of their own accord.

cance of creative work, where kindness and a cooperative rather than competitive attitude play a major role (as in Example 2).

Based on the analysis of the data and observations during Phase II of the research, the authors recommend the following conclusions and solutions for early school education teachers to be employed when using the group project method of teaching:

1. Stimulating the production of further ideas to improve the original design depended less on the types of feedback, questions and resistance responses, and more on the atmosphere created by the members of different teams;
2. The results from Phase I were confirmed: complimenting the strengths of the design has a positive impact on the subsequent process of developing new ideas and dealing with resistance responses (building a pleasant, friendly atmosphere from the very beginning of each group work session);
3. Building a community and a sense of shared responsibility for the outcome of the collaborative effort leads to success (*Well, what is OUR task? To make equipment that does not yet exist*; OUR meaning a project team: designers, clients and executors);
4. Eliminating rivalry that made team members focus on hiding ideas from other teams rather than producing solutions on their own.

The research findings can be applied in grades I-III during the implementation of group projects. The study shows that organising group project activities is an excellent way of learning since it fosters intrinsic motivation, owing to the appeal of the prospect of action/creation itself.

## **Limitations**

The study in question is part of broader research on group projects during primary school education's first stage. The authors believe that it should be continued, as it helps understand which types of constructive feedback foster a sense of community among learners and which lead to the destruction of creative group work. The authors are aware of the contextual nature of the learning process and the specific nature of conversations within different groups of learners. Therefore, one must recognise the limitations related to the personal traits of younger pupils and their teachers. This type of research is limited in the Polish school environment because teachers working with grades I-III rarely choose group projects as a teaching method. Therefore, the study in question was conducted in common school rooms, not classrooms. Irrespective of the

research area, however, using a qualitative approach may yield other interesting and repeated findings, thereby leading to identifying general trends. The authors believe that the methodological procedure should be refined in further research and adapted to the cultural conditions of education in Poland.

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