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The Impact of Development-questioning Activities on Students' Pre-writing Ideas

Jia Ling HONG [a*], Chang-Yen LIAO [b], Tak-Wai Chan [a] & Jui-Fen Chang [a]
[a] *Graduate Institute of Network Learning Technology, National Central University, Taiwan*
[b] *Department of Hakka Language and Social Sciences, National Central University, Taiwan*
*110524025@cc.ncu.edu.tw

Abstract: Studies suggest that questioning is a potent cognitive tool that can guide students toward a more profound engagement with their learning and comprehension, mainly driven by their innate curiosity. In conventional teaching methods, instructors often assign writing topics directly, causing a lack of enthusiasm and hindering students' ability to generate original ideas. This circumstance can gradually breed an aversion to writing. In response to this challenge, our research aims to introduce a question-oriented activity that provides students with a participatory platform for idea generation and organization. By engaging in group collaboration and brainstorming, questioning elements are presented to stimulate students' curiosity. Participation in this activity allows students to compile a broad range of ideas for future writing tasks. The intended outcome is to aid students in developing coherent ideas, bolster their motivation for writing, and refine their skills in questioning.

Keywords: Questioning, Round-robin brainstorming, Pre-writing, Group collaboration

1. Introduction

Hidi's (2006) research emphasizes that curiosity and interest profoundly impact learning motivation. Clark et al. (2019) similarly discovered that student questioning can positively stimulate their curiosity. However, in many Taiwanese classrooms, students avoid asking questions, resulting in an unnerving silence. The reasons behind students' avoidance of questioning could range from fear of inadequate knowledge, potential criticism, or simply a lack of interest in the topic. As prior research has illustrated, questioning skills are vital to continually promote student thinking, facilitate valuable feedback, and enhance topic comprehension, enabling students to uncover more profound knowledge (Wardani, 2014).

Writing is divided into three stages: pre-writing, writing, and post-writing. The pre-writing phase holds significant importance for students as it not only prompts them to explore the topic but also assists them in envisioning how to apply it in their subsequent writing, thus aiding in constructing their content (Hagtvedt et al., 2019). However, in the current education scenario, with an emphasis on the outcomes and quality of writing, the importance of the writing process is often overlooked. Hence, urging students to contemplate the topic before writing can effectively influence their subsequent writing development (Hashempour, Rostampour & Behjat, 2015), sparking curiosity to pose questions and prompting more profound thought about the subject matter.

Given the above, this study centers on pre-writing activities and explores the impact of students' questioning abilities and idea generation before writing. Cultivating a questioning habit can stimulate students' curiosity and enhance their questioning skills, encouraging active writing participation and gradually fostering students' interest in writing (Hidi & Renninger, 2020). With the research question in mind, this study will endeavor to design a Question Generation & Combination (QGC) activity for implementation before writing, offering students an environment to gather and organize their ideas. This activity combines students' curiosity with round-robin brainstorming (Etemadzadeh, Seifi & Far, 2013), guiding students to delve

into and reflect on the topic by continually sparking ideas based on their teammates' thoughts. While curiosity diminishes over time, interest can sustain ongoing exploration (Grossnickle, 2016). Thus, facilitating the establishment of sufficient background knowledge through the activity can smoothen composition in subsequent writing.

2. Literature Review

2.1 Writing Ideas and Challenges

Writing is a form of self-expression, where individuals organize their knowledge to share with readers and develop skills in collecting information. Previous research has divided the writing process into three cognitive stages: planning, translating, and revising (Berninger & Swanson, 1994). It involves planning and generating ideas, organizing thoughts, and transforming them into written expression (Baaijen, Galbraith & Glopper, 2014), followed by evaluating and revising the text. The process of writing instruction typically includes pre-writing, drafting, revising, and sharing (Keen, 2017), with pre-writing being a crucial and often overlooked stage in the writing process. Engaging in pre-writing activities can assist students in planning or organizing their ideas, effectively influencing the development of subsequent writing (Hashempour, Rostampour & Behjat, 2015), and fostering motivation for writing (Mogahed, 2013).

In previous writing experiences, teachers typically adopted a product-oriented approach, focusing on students' writing skills and performance. Students' works were evaluated and commented on based on their content, and students might or might not incorporate the suggestions provided by the teacher. This traditional approach of using prompt-based essays often presented challenges for students, particularly in terms of knowing how to begin their writing. This could be due to students feeling unable to generate ideas, lacking interest in the topic, or not having relevant background experiences associated with the topic. Consequently, students found it difficult to express their creativity within the given time constraints. Over time, due to a lack of ideas and limited curiosity in writing, coupled with insufficient background knowledge, students developed an increasing aversion towards writing.

2.2 Brainstorming

The biggest challenge at the beginning of writing is the lack of ideas, and brainstorming is an effective way to generate new ideas (Hashempour, Rostampour & Behjat, 2015). Scholar Osborn (2012) mentioned that brainstorming enhances creative output, involving four conditions: no criticism of ideas, building on others' suggestions, embracing any unconventional ideas, and generating a large quantity of ideas. By creating a stress-free environment through brainstorming, students can improve their writing skills (Hashempour, Rostampour & Behjat, 2015). Stimulating students' thinking through brainstorming helps them explore ideas related to writing activities and how they can integrate or generate ideas based on their prior background knowledge. Prior to conducting brainstorming, students do not need to make any preparations, and they can freely record their ideas during the process. The purpose is to guide students in utilizing this new thinking approach to generate a multitude of ideas.

In this study, the round-robin brainstorming approach is adopted as one of the methods of brainstorming. According to scholar Roestiyah (2008), it aims to generate ideas within a relatively short period, accumulate ideas, and engage in discussions without being influenced by team members, ensuring that each individual has an equal opportunity to share ideas. Round-robin brainstorming is a method of collaborative idea generation (Mogahed, 2013) that also enhances students' autonomy and sense of responsibility, thereby increasing their motivation (Fawzi & Hussein, 2013).

In the past and up to the present, many students have encountered a lack of inspiration and curiosity towards writing, which limits their imagination. Therefore, this study aims to

stimulate students' curiosity through multimedia materials and generate motivation by prompting them with interesting questions. The round-robin brainstorming method is then employed, giving each student an opportunity to contribute ideas and unleash their creative thinking. By drawing inspiration from the ideas of their team members, who bring different perspectives, the students can explore new directions of thought and collect ideas generated collaboratively. These ideas will serve as the basis for the subsequent writing process in terms of direction and content.

3. Model Process Design

This study focuses on the generation and organization of students' ideas, based on the core concept of the "Interest Creator Theory" (Chan et al., 2018). A "QGC" (Question Generation & Combination) activity is designed and a user-friendly platform is developed for students to use prior to writing. The study adopts a "design research method" with the aim of designing the "QGC" model based on theoretical directions and improving students' writing skills. After establishing the research direction and designing the curriculum, the study is implemented in a primary school teaching environment. The research process, including students' writing progress, is documented and discussed with the research team. After each class, the researchers and the teaching staff discuss the students' learning outcomes and make adjustments to the activities based on the analysis and feedback. The investigation spans one semester and explores topics in social and natural sciences.

The "QGC" (Question Generation & Combination) activity consists of two main components: idea generation and idea organization. It includes four stages: generating ideas, categorizing ideas, integrating ideas, and transforming ideas. By employing the principle of collecting a large number of ideas through posing questions, the aim is to organize scattered ideas, make them more concrete and explicit, and enhance the understanding of the core ideas. After the idea generation stage, group discussions are conducted to categorize and integrate ideas, assisting students in organizing their thoughts. Prior to engaging in the QGC activity, related materials such as multimedia resources can be used. These materials provide inspiration based on different themes, integrating elements like text and images, and conveying information interactively to facilitate student engagement. Through this approach, students can establish preliminary background knowledge and stimulate their curiosity.

In the first stage, idea generation, it is essential to have a plethora of ideas for the subsequent process of organizing ideas. The round-robin brainstorming technique is employed, providing an environment where students take turns writing down their ideas. Through group collaboration, students engage in associative thinking and generate more ideas. The objective is to allow students to generate additional ideas by leveraging the input of others. Additionally, the system platform will offer features for preserving and reviewing ideas, preparing for subsequent collaborative discussions. The following three stages focus on further organizing the generated ideas, namely categorizing, integrating, and transforming ideas. These ideas can stem from the knowledge and experiences of group members. Through group discussions, students organize their perspectives and understandings of the problem, enabling them to consider the problem from different angles. During the categorization stage, all ideas within the group are classified and organized through group discussions. Students can categorize ideas based on their types, sources, and observed characteristics. The system platform assists students in swiftly organizing ideas by dragging and dropping ideas into relevant categories, establishing a conceptual framework of the collected ideas within the group. As students progress through the stages and gain a better grasp of the ideas, they reach the integration stage. Here, they can consolidate seemingly similar ideas, further organizing ideas within each category to reduce redundancy and clutter. The system platform allows students to view the before-and-after merging of ideas, enabling them to freely adjust and create more precise ideas. The final stage, transformation, involves students converting their ideas into open-ended questions. The purpose is to employ questioning techniques to help students gather more information and continuously stimulate their curiosity. Through the collaborative process within the group, ideas can be expanded, leading to the collection of a broader range of ideas. The platform provides transformation

examples and assists in identifying ideas that can be transformed, fostering imagination and creativity during the discovery of new ideas, and developing students' cognitive flexibility.

Through this activity, students may begin to conceptualize the structure of their own writing in their minds and contemplate how to apply the materials to their articles. Despite collecting the same set of questions within the same group, each student's presentation differs. As students organize these idea materials into a coherent essay, they actively structure their thoughts and employ questioning techniques. This encourages students to think more attentively and further promotes their active engagement in the activity.

4. Preliminary assessment

4.1 Research participants

The research participants of this study were fourth-grade and five-grade students from an experimental school in Taoyuan, as well as teachers and researchers. The researchers provide the relevant theoretical basis, and discuss with the teachers the design of the course theme textbooks, the selection of multimedia materials, and the learning status of the students. The selected students are expected to use QGC activities to promote the process of generating their ideas, and through data analysis and physical classroom observation, further adjust the planning of activities suitable for students.

4.2 Data collection and research tools

This study will use quantitative and qualitative analysis, conduct two open questionnaires before and after the activity, including questioning ability questionnaire and writing ability questionnaire, for evaluation and analysis. At the same time, the idea database stored by students in the activity is viewed Source for gathering ideas. In addition, after the event, we will conduct interviews with the students to gain a deeper understanding.

Questionnaire: A test used to assess the quality of students' ability to ask questions about the topic before and after the activity. This questionnaire focuses on assessing students' questioning ideas and the number of ideas, and evaluates the quality indicators of ideas based on three aspects, Including topical relevance, fluency and extension.

Writing Ability Questionnaire: It is used to assess students' ability to write descriptions of topic-related pictures within a limited time. This questionnaire will assess the number of words written by students and use punctuation as a unit of calculation to measure the number of ideas in writing.

4.3 Preliminary Results and Discussion

The subject of this study, which carries significant malleability, is the energy component of natural science. We segregate the class into three groups to conduct Question Generation & Combination (QGC) activities. This study tentatively scrutinizes students' questioning ability and its bearing on writing through QGC activities. To decode and analyze the ideas engendered by students, we hark back to the writing creativity indicators and standards employed in earlier studies and define scoring standards for the questions. These include theme relevance, fluency, and originality as three guiding indicators to procure the question quality scores of each group and the entire class for statistical scrutiny, as demonstrated in Table 1.

Table 1. *Paired sample T-test results*

	SD	t	df	ρ
Question _Average Score	0.64	4.33	30	0.002
The total amount of question ideas	3.74	3.79	30	0.004
Write word count	5.21	0.40	30	0.701
The total amount of Write ideas	5.22	1.88	30	0.093

The principal aim of this study is to probe whether the questioning activities will alter the students' writing and questioning capabilities. By the analytical outcomes of the pre-and post-activity tests, the quality of questions, and the abundance of ideas, the average word count and the number of ideas in the post-test outweigh those of the pre-test. The study identified a significant divergence between the average quality of questions and the abundance of ideas, signifying that students bolstered their questioning skills through the QGC activity(p<0.05). Even though the influence on writing did not reach statistical significance, the activity facilitated students in reflecting upon the writing process, on average, as indicated by the data.

Most students deem writing their poorest skill, and the shortage of ideas is viewed as one of the vital elements affecting creativity. Furthermore, students are customarily in a state of passive participation in the classroom. Therefore, stimulating thought and soliciting questions in writing activities is paramount. Future research will delve more deeply into the various stages of the movement to fathom how students amplify and organize their ideas during the activity and the linkage between idea transformations and writing. The preliminary research outcomes are elucidated based solely on the results above.

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