

Enhancing Meaning-Making for Student Teachers in Early Childhood Education With Visual Techniques

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Abstract

Student teaching is a “critical phase of preparation for teaching [which] requires pre-service teachers to master a wide array of complex skills” (Gursel-Bilgin, 2023, p. 63). Student teachers often struggle to engage with complex theoretical concepts, highlighting a gap in strategies that bridge theory and practice while catering to diverse learning needs. This study addresses this challenge by exploring how Sketchnotes, integrated into lesson plans, can enhance meaning-making and retention. Lesson plans were reimaged as visual maps using Sketchnotes featuring “containers” (key concepts in boxes) and “connectors” (arrows showing relationships) to simplify content into manageable chunks. A cohort of 25 third-year early childhood student teachers participated, with feedback gathered through an anonymous qualitative survey of two questions. Results revealed that students found Sketchnotes helpful for understanding and applying theoretical concepts. Participants noted increased confidence and engagement, while the visual and non-linear structure accommodated a variety of learning preferences. Educators also reported improved efficiency and clarity in lesson preparation. This study underscores the potential of Sketchnotes to address the challenges of teaching complex concepts in higher education, offering an accessible, student-centered approach that fosters deeper comprehension. Future research could explore the adaptability of this method across disciplines and its long-term impact on teaching practices.

Keywords: visualisation, sketchnoting, teacher education

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Introduction

Every student has unique needs to be able to learn successfully. This includes using text, spoken dialogue, visual aids, experiential activities, music, or other support systems, with each individual student relying on a single style or a blend that suits their exclusive learning requirements (Paolini, 2015). Creating classrooms that meet these diverse needs yet maintaining the core essence of the content can create complex demands for teachers in preparation time and easy flow. In responding to these needs, this research project explores how re-creating the lesson plan for each classroom session could better support sense-making and understanding. The question posed was “Can sketchnotes integrated into lesson plans increase sense-making and understanding for early childhood student teachers?” Rather than relying on the traditional, heavily textual, time-bound approach to lesson plans, this project investigates the possibility of using sketchnotes - visual maps that break the content down into more manageable ‘chunks’ of information.

Background and Context

The group comprised of 25 early childhood student teachers in two cohorts. They came from a range of demographics but all were working in early childhood centres in the local area. Their varied experiences of education shaped their approach to learning. Some spoke openly about struggles with text-heavy, reading-focused teaching methods, while others felt more confident with these traditional approaches. Many of the group did not speak English as their first language and responded positively to substituting drawings, symbols or meaningful doodles into the sketch notes.

In this context, the decision was made to use Sketchnotes (Rohde, 2013) to create visual maps of the content of the session. Sketchnotes focus on “ideas not art” (Rohde, 2013, p. 17) and are thus deeply invested in the sense-making processes of the classroom. However, one draw-back of sketchnotes is that students often express apprehension about drawing, as they equate it with artistic skill rather than viewing it as a tool to help them understand concepts and ideas. This reflects a wider issue in education where visualisation is not a skill that is widely encouraged in schools or tertiary environments (Brown, 2014).

Each three-hour session was broken up into 5-8 “chunks” visually presented in the Sketchnote. This approach created a non-linear pathway through the Sketchnote that enabled space for discussion, questions and moments of deconstruction.

The initial lay out of the Sketchnote lesson plan was provided to the students on the white board and students contributions, connections and reflections were added as they happened making an organic, collaborative map of what they understood.

Literature Review

Definition

Visual thinking, sketchnoting, and doodle noting are three of the terms used to describe the integration of drawing for better understanding across a range of learning experiences. In what is described as the seminal work on sketchnotes, Rohde (2013) describes them as “rich visual notes” (p. 2) which capture ideas in a visually active manner. He argues that sketchnoting is universally accessible as they are about “ideas, not art” (Rohde, 2013, p. 18).

It must be said that this broad statement does not fully address potential barriers, such as learners' apprehension about drawing. The deeply ingrained perception that drawing belongs to the artistic realm rather than as a tool for cognitive processing (Qvarnström, 2019) can make it difficult for students to adopt this approach for making meaning of class content. In many cases this reticence to use drawing is due to a lack of explicit instruction in visualisation skills in educational contexts that more often focus on text and verbal approaches (Brown, 2014). As a result, drawing and sketching are synonymous with art rather than a way to make sense of ideas (Qvarnström, 2019).

However, some studies have found that sketchnoting was seen by the students as novel and intriguing but did not necessarily create a more significant impact than traditional note-taking (Bratash et al., 2020). In contrast, Dimeo (2021), described visual notetaking as “more than simply highlighting or underlining text; it involves active engagement with the content” (p. 306). This assertion aligns sketchnoting as a process of personal knowledge construction through interaction. However, it does not, fully engage with the issue of cognitive or cultural constraints.

DeWaard et al. (2024) indicate the importance of “ensur[ing] that sketchnotes intended for wider academic audiences address issues of power and hegemony by honouring diverse voices” (p. 141). This suggests that some adaptations to sketchnotes are needed to ensure they honour diverse voices and different ways of knowing. Arzaga (2023), in part, answers this point as he reinforces the individualized nature of sketchnoting, emphasizing that the pieces and their eventual makeup are dependent on the interpretation of the learners through the lens of their previous experiences. A participant in his study wrote “I can see how the pieces are connected and organised which helps me remember the sequence” (p. 79). This reinforces the idea that sketchnotes support and strengthen individual learning.

Understanding how sketchnotes operate as a process for making sense of complex ideas requires a closer examination of visualisation — the ability to create mental images and external representations that support learning. The following section explores how this visual approach functions and its significance within our learning environments.

Visualisation

Visualisation is a process of being able to create a mental picture of something yet it is rarely encouraged in traditional school environments where drawing is seen as a distraction rather than a valid way of mapping out learning (Fernández-Fontecha et al., 2018). Nørgaard (2017, as cited in Baff, 2020, p. 370) explains that sketchnotes “can be thought of as a “hand-drawn visualization made on paper or tablet, created within a short time frame” highlighting their role in capturing ideas quickly and making them accessible.

The physicist Albert Einstein is quoted as saying, “If I can't picture it, I can't understand it” (Horgan, 1991, pp. 36–37), underscoring the vital role that mental imagery can play in understanding abstract or complex ideas. In this context, sketch notes support this by enabling learners to create visual and textual representations based on how the listener sees and understands the content. An important point about creating a sketchnote is that complex concepts and ideas can be deconstructed into their contingent parts. This makes it much easier to understand them and the way they fit together. However, such simplification also carries a risk because when complex ideas are deconstructed too far or taken out of context, important nuances may be lost.

Gansemer-Topf et al. (2021) suggest that sketch notes can “break down the complexity of an image or concept into basic visualisations” (p. 306). Similarly, Arzaga (2023) discusses how visualisations can reflect individual understanding. Nørgaard (2017) also describes sketchnotes as a “genre of visualisation” (p. 2) rooted in making abstract ideas concrete.

Dual Coding Theory and Cognitive Load

Sketchnotes are theoretically positioned within Dual Coding Theory which suggests that the human brain encodes words and pictures using two separate systems. Csachová and Kidonová (2022) explain that these channels can work independently but can also interact with each other to form associations. When both channels are engaged, information is effectively captured twice, enhancing memory and recall (Paivio & Csapo, 1973). Mayer (2005) agrees with Paivio and Csapo (1973) that the brain processes words and pictures separately, but adds that as each system has a limited amount of storage, using both systems reduces the possibility of cognitive load in one or both of them. However, an overly complex sketch note can have the opposite effect and cause overwhelm in the listeners (Baff, 2020; Fernandez-Fontecha et al., 2018).

Beyond dual coding, sketchnoting also involves resemiotisation. This refers to the process by which meaning can change when information is displayed in different semiotic modes (Iedema, 2003). In the context of sketchnoting, this involves transforming spoken or written information into text, symbols, and visuals, to create a multimodal depiction of the content.

Unlike traditional note-taking, sketchnoting invites continuous revisiting and reorganisation of ideas as learners deconstruct, reconstruct and often re-story concepts as they create new representations (Arzaga, 2023). As Zhou (2024) explains, “knowledge and sense-making are constantly re-built by dynamic interplays between students’ existing knowledge and the new knowledge” (p. 512). This dynamic interplay enables deeper engagement, but can also introduce cognitive challenges as learners integrate new and prior knowledge. This is not simply moving from one semiotic code to another but entails an active meaning-making process that deepens comprehension (Bezemer & Kress, 2016).

Design of the Study

The study was influenced by the co-constructive nature of the classroom where understanding was created in group discussion and questioning by all the class members. The main research question was: *Can sketchnotes integrated into lesson plans increase sense-making and understanding for early childhood student teachers?*

There were two sub-questions to focus on particular elements of the project:

1. What kinds of visual elements do students find most helpful for understanding complex ideas or concepts?
2. How does my own planning and delivery of content change when I use visual strategies?

The study used a two-question anonymous survey of the students at the end of each semester. The questions asked were: a) *In what ways (if at all) has this approach aided you to understand the class content better?*; b) *Are there particular parts of the text-visuals approach that you found particularly helpful for your understanding? Why was this so?*

The survey was embedded in the LMS page for the final session of the class. Responses were then analysed thematically looking for recurring patterns, similarities and differences.

Methodology and Methods

This qualitative project aimed to capture the stories of the way the students interacted with the sketchnotes and the associated deconstruction processes. Within this approach it was also important for the teacher to position herself as a teacher-researcher and acknowledge her realisation that the students were struggling to synthesise what they were learning and to look at it through critical lenses. The visual language of sketchnotes, combining pictures and words, became a response to this challenge by offering a more multimodal, accessible way of making sense of ideas.

This presentation was not just an investigation into sketchnotes but also a reflection on the teacher's own pedagogical choices and evolving practice. It aligns with constructivist and interpretivist methodologies aiming to make clear links with theory and practice through the students' own lived experiences. Learning was seen as an active process building on the student's previous personal and professional knowledge. In other words, it was not about simply assessing the effectiveness of sketchnotes as visual maps but as an alternative to text-based, linear approaches in supporting learners in processing, evolving, and deepening their understanding over time.

The visual map of the class empowered the students and teacher to challenge assumptions and try out new ideas and co-construct conclusions. In this way, the sketchnotes and the interactions around them were both the site of the research and a foundation for a growing pedagogy. Finally, this approach depends on relationality and trust in the classroom aligning with Māori and Pacific cultural values and supporting individual stories and sense-making through multimodal expression.

Findings

The thematic analysis revealed three themes in the data:

Increased Engagement

The participants reported the Sketchnote helped them understand what the session was about and stay focused. One student commented that it "Helps to understand what our focus is and what we need to think about from each topic so we can explain our suggestions in detail." Another student suggested that "I have a really good understanding of what we are going to cover, it is simple to understand and only takes one glance to get an overview." Similarly, "It has made it more understandable. Seeing step by step is helpful for my learning." Another suggested the sketchnote "showed the content is interesting and motivates me to focus better."

Cognitive Load, Non-linearity, and Visual Memory

Students described how sketchnotes reduced feelings of overload and helped them process information in manageable ways. One student suggested "Because I learn better visually. To have visuals is a better way for me comprehend sentences and intake the assignments given." Another suggested "It has really helped me to understand my course better and helped me visualise the things that I am planning to write for my assignment." Similarly, "It helps me

understand better and it's easy to revisit again and again" and "I like it when it is in boxes with arrows pointing from each point to the next."

Discussion

Increased Engagement

Participants reported that the Sketchnote made the session easier to understand (Dimeo, 2021). This supports DeWaard et al.'s (2024) idea that diagrams give students a framework to work within. While it could be argued that visuals effectiveness could be due to novelty the research project spanned 17 weeks negative comments beyond reminders like "don't forget, not everyone is a visual learner." Crucially, sketchnotes blend both visual and textual elements, and align with Paivio's dual coding theory, which suggests that the brain processes visual and verbal information in separate systems. Although dual coding theory has faced critique (Bright et al., 2004; te Linde, 1982) the value of including visuals remains widely accepted.

Reduced Cognitive Load, Non-linearity, and Visual Memory

Another theme that emerged from the findings was the reduction in the cognitive load of the sessions. Gansemer-Topf et al. (2021) suggest that this can be achieved through using "language, space, frames & connectors, people, and objects" (p. 306). Instead of using a text-heavy approach the layout of a sketchnote can encourage questions, reviewing, returning to explanations and reconstructing the story, mimicking the way the human brain naturally learns. However, in the same way that heavily textual approaches can cause cognitive overload, a badly designed sketchnote can have the same impact. (Sweller, 2020). Fernandez-Fontecha et al. (2018) suggest that "visual thinking permits certain options in spatial organization that cannot be found in language (p. 11).

Conclusion: Future Research

Although this study was small in scale, several conclusions have begun to emerge. First, sketchnotes supported student's sense-making by enabling them deconstruct and follow complex content more easily. The process of chunking information and dividing it visually with containers, connectors, and space helped students clarify their understanding and see relationships between ideas. This approach was particularly valued by students who commented on the way it reduced overload compared to traditional text-heavy content structures.

Second, the combination of text and simple visuals made the material accessible to a diverse group of learners. Multilingual students, those who preferred physical or visual engagement, and those comfortable with text all found ways of making the learning their own. In this way, sketchnotes functioned as both a pedagogically sound and culturally responsive tool, aligning with inclusive, multimodal principles.

Third, the literature's assertion that sketchnoting is about "ideas, not art" shifted the focus from creating art to creating memory aids — practical visual structures that support retention and understanding.

Sketchnotes are more than just a visual aid. They represent a way of thinking, reflecting, and making meaning together. This approach not only supports understanding but honours diverse ways of knowing and invites both students and teachers into a more relational, reflective learning space.

The next step in this work is to explore how sketchnoting might help students reflect more deeply by breaking down and working through practice scenarios. It will also be valuable to collect data over time and across different student groups to see whether their responses shift as they grow in confidence with this method.

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