Article

Applying Thematic Analysis to Education: A Hybrid Approach to Interpreting Data in Practitioner Research

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Abstract

Thematic analysis (TA), as a qualitative analytic method, is widely used in health care, psychology, and beyond. However, scant details are often given to demonstrate the process of data analysis, especially in the field of education. This article describes how a hybrid approach of TA was applied to interpret multiple data sources in a practitioner inquiry. Particular attention is given to the inductive and deductive coding and theme development process of TA. Underpinned by the constructivist epistemology, codes were driven by both data per se and theories, through a "bottom-up" and "top-down" approach to identify themes. A detailed example of six steps of data analysis is presented, which evidences the systematic analysis of raw data from observation and research journals, students' focus groups, and a classroom teacher's semistructured interviews. This example demonstrates how classroom practice was unpacked and how insiders' insights were interpreted through the theoretical lens while also allowing the participants to express themselves. By providing step-by-step guidelines in data coding and identification of themes, this article contributes to informing qualitative researchers, especially teacher-researchers who undertake their research in the classroom setting.

Introduction

Thematic analysis (TA) is a commonly used qualitative data analysis approach in psychology (Braun & Clarke, 2006), health care (Braun & Clarke, 2014), sport and exercise (Braun et al., 2017), and many other fields (Boyatzis, 1998). However, a lack of description about the process and details of analysis often leads the TA report readers to wonder how exactly qualitative information is systematically coded and how themes emerge from the data (Tuckett, 2005). Taylor and Ussher (2001) argue that "themes do not just lay about waiting to be discovered, they do not simply emerge, but must be actively sought out" (p. 310). Therefore, an implicit, passive description of the process for undertaking TA, to some extent, also denies the active role the researcher plays in constructing and interpreting realities from meanings. In addition, an absence of explicit guidelines on how to undertake it, similar to that of other methods (such as grounded theory), has resulted in blurred boundaries between TA, content analysis, and other qualitative analytical methods (Vaismoradi et al., 2013). It seems confusing for researchers to distinguish and choose between TA and content analysis, considering many

similarities between the approaches and the least thoughtful discussion in the literature (Vaismoradi et al., 2013). Thus, TA is often poorly demarcated and has been critiqued as "anything goes" in qualitative research, failing to be considered as a specific, named method in its own right (Braun & Clarke, 2006).

Although some endeavors have been progressively made to detail a step-by-step guide to apply TA to practice in psychology, nursing, and sport and exercise research (Braun & Clarke, 2006; Braun et al., 2019; Braun et al., 2017; Clarke & Braun, 2014; Fereday & Muir-Cochrane, 2006; Nowell et al., 2017), there is a paucity of description addressing the field of education, which became the impetus of this article. The article aims to fill this gap in practitioner inquiry from a teacher-researcher

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perspective, articulating and demonstrating that TA is an accessible and flexible method to analyze qualitative data collected in the natural classroom setting. In addition to detailing the steps of conducting TA as other practical examples have undertaken (Braun & Clarke, 2006; Fereday & Muir-Cochrane, 2006; Nowell et al., 2017), this article has its strength in outlining multiple data collection tools and their associated analytical processes. Such diverse data sources are flexible enough to accommodate the natural classroom and provide sensitive and rich descriptions of the educational phenomenon. The steps of analyzing them are instrumental in enhancing teacher-researchers' capability of carrying out theoretically and methodologically sound analysis.

The article begins with an overview of TA followed by a description of a research project. Using our practitioner research as a real-life example, we sketch out methodological orientations and data collection tools. The article continues with detailing the coding and thematizing process with respect to different data sources collected in a school context. The discussion section involves the limitations and challenges encountered in the course of data analysis. Throughout, an example of a practitioner inquiry is presented to illustrate how TA can be applied, using a hybrid approach of inductive and deductive coding and theme development in the field of education.

TA: Scope and Application

TA involves finding repeated meanings across a data set, which is crucial to the interpretation of phenomena (Vaismoradi et al., 2013). A theme refers to a specific pattern found that captures some crucial information about the data in relation to the research questions and features patterned meanings across the data set (Braun & Clarke, 2006). It pertains to a shared topic with regard to area of focus rather than summaries of data domains (Braun & Clarke, 2019). The terms "pattern" and "theme" are used interchangeably in the literature, and in this article, "theme" will be consistently used.

A code is a word or short phrase that "symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data" (Saldana, 2016, p. 4). Informed by grounded theory, codes can come from the data itself (*inductive coding*) as well as particular theoretical or epistemological positions (*deductive coding*; DeCuir-Gunby et al., 2011). Codes summarizing the surface meaning of the data can be identified as semantic codes, and those dig deeper into the data and prioritize the analytical framework can be termed as latent codes (Clarke & Braun, 2014). For instance, teacher-directed pedagogy is coined as stronger framing (F+) in Bernstein's (2000) theorization. As such, stronger framing or F+ can be developed into a code to measure and describe teacher's pedagogy in classroom practice. F+ is a latent code since it is predicated on the theoretical framework and identifies hidden meanings of the data. Joffe (2012) states that contemporary TA combines the analysis of the frequency of the occurrence of codes with their implicit

meanings, affording the advantages of subtle and complex interpretations of social realities.

Based upon a set of codes, definitions, examples, and "when to use" and "when not to used" sections, a codebook can be developed as a guide to help analyze data (Guest et al., 2006). However, in this article, we chose code names, definitions, and examples to structure codebooks, as an articulate definition collapses inclusion and exclusion criteria (DeCuir-Gunby et al., 2011). By assigning codes operationalized in the codebook to raw data, the coding process proceeds as a critical link between data collection and interpretation of meaning (Charmaz, 2001).

There are different approaches to TA (Boyatzis, 1998; Guest et al., 2011). In "Using Thematic Analysis in Psychology," Braun and Clarke (2006) delineate a straightforward, step-by-step approach to conducting TA and now is referred to as reflexive TA (Braun & Clarke, 2019). We consider the guidelines outlined in the 2006 paper as a structured approach to coding and theme development, and Howitt and Cramer (2007) also confirm it as a systematic and deliberate method. In addition, Braun & Clarke's (2019) TA is described as a theoretically flexible method rather than "a theoretically informed and constrained methodology" (p. 583). Hence, their approach resonates with our constructivist epistemology. We concur with the 2006 paper to celebrate the flexibility as one of TA's advantages and endeavor to use both deductive coding and inductive coding. Such an approach may assist those who engage in practitioner research to make active decisions and use TA as a particular form of analysis. The example of the data analysis process outlined in this article, therefore, will follow six steps based upon Braun and Clarke's (2006) approach to TA:

1. familiarizing yourself with your data,
2. generating initial codes,
3. searching for themes,
4. reviewing themes,
5. defining and naming themes, and
6. producing the report.

In practitioner research, we argue that the first step of familiarizing with data not only indicates conducting and transcribing the focus groups and interviews by educational researchers themselves but also involves preparing, teaching, observing, and recording lessons in research journals to document reflections on classroom practices. This step allows reflecting on teaching and students as well as to "become intimately familiar with literally every word that was exchanged between you and the participant" (Saldana, 2011, p. 44).

The following steps of data analysis integrate both inductive and deductive coding. Crabtree and Miller (1999) adopted a theory-driven, deductive approach to coding in which someone else's theoretical framework(s) is applied to develop the codebook(s) and then codes are attached to the texts. The New South Wales (NSW) Department of Education and Training (2003, p. 5), for instance, proposes a pedagogy model: *intellectual quality*, *quality learning environment*, and *significance* as the features of classroom practice aiming to improve student

outcomes. These three dimensions of teaching can be used as a codebook to examine classroom practices aligning with their definitions and supporting elements.

As "a good thematic code is the one that captures the qualitative richness of the phenomenon" (Boyatzis, 1998, p. 31) and "describes the bulk of the data" (Joffe, 2012, p. 226), initial codes can also be data driven in order to fully capture participants' views. For example, assigning a word or short phrase to the topic of a passage of qualitative data (descriptive coding) and taking the participants' own language as codes (in vivo coding) can be considered as inductive coding (Saldana, 2016). An integration of inductive and deductive coding reflects a balanced, comprehensive view of the data, instead of purely relying on the frequency of codes decontextualized from their context.

After familiarizing with data and developing codes, the next step involves searching for themes. Identifying broader patterns of shared meaning across the data set, coded data can be developed into a theme for illuminating the research question (Charmaz, 2001). Good themes have to work together and form a coherent analytic story, and some codes and themes will be discarded (Clarke & Braun, 2014). This step ends with a set of candidate themes and analysts' sense of the relationship between themes.

Reviewing themes includes two levels of checking: (1) checking whether the themes capture the essence of the coded data in relation to the research question and (2) checking whether the themes work in the whole data set (Clarke & Braun, 2014). Analysts have to closely interrogate the data and undertake an iterative thinking process moving back and forth as needed, incorporating and interweaving different data sources, and reflecting on classroom practices and literature in the field. This step completes with a final set of themes.

The step of defining and naming is the stage where informative and engaging names are given to each theme followed by the last phase of producing the report. In addition to selecting excerpts from the words of participants (Fereday & Muir-Cochrane, 2006) and analysts' interpretation, literature has to be used to confirm as well as compare examined evidence in reporting the results (Tuckett, 2005). The writing of the final analysis is about telling stories, which is the product of prolonged data immersion, deep thinking, and reflection (Braun & Clarke, 2019).

Engaging Disadvantaged Students in a Chinese as a Foreign Language Classroom: A Practitioner Inquiry

This section aims to provide background on the reported practitioner inquiry—aiming to unpack pedagogic practice in a Chinese as a foreign language (CFL) classroom and how it influences students' engagement and identities. Assumptions underpinning the research are mapped out followed by two theoretical frameworks adopted. Connections are hence made to the research question: How does pedagogy exert an influence on students' Chinese learning engagement and identities?

In the practitioner inquiry presented in this article, we investigated disadvantaged students' engaging learning experiences and identities in a CFL classroom. Considering students' low socioeconomic status (SES) backgrounds, we assume that "treatment" associated with disengagement is supposed to be directed at a wider social context instead of individuals (Furlong, 1991). As Bourne (2008) notes, pedagogic communication is not only a carrier of skills, but it also relays ideological messages from external power relations. Therefore, incorporating external social and cultural impacts into this research problematizes the tensions between pedagogies, learning experiences, and identities that are interwoven with power relations. It is especially important for those disadvantaged students who have been bearing the greatest brunt of educational inequalities and disempowerment over long periods of time (Munns, 2007; Willis, 1977).

The theoretical frameworks included Bernstein's (2000) conceptualization of classification and framing and the Fair Go Project's (FGP) pedagogical frameworks (Fair Go Team, 2006). These concepts informed the deductive coding process in the TA of the data set.

Bernstein's Classification and Framing

In the school context, *classification* translates the power relations and concerns what should be and should not be selected to teach (Singh, 2002). It varies on a continuum between stronger and weaker forms. In the case of stronger classification (C+), categories of knowledge are well insulated from each other, while the boundaries between categories of knowledge are more permeable and elastic in the case of weaker classification (C−). *Framing* refers to controls on communication in the pedagogic relationship between the teacher and students (Singh, 2002). If the pedagogy is more teacher-directed, it might be described as stronger framing (F+); if the pedagogy is more student-centered, it might be described as weaker framing (F−; Bernstein, 2000). Predicated on this theoretical framework, codes of C+, C−, F+, and F− can be developed to constitute a codebook and deductively code pedagogic practice in the classroom. It addresses part of the research question—pedagogy.

The FGP's Pedagogical Frameworks

The FGP's engagement framework (Fair Go Team, 2006) was also used as another theoretical lens to interpret students' learning experiences. Student engagement in learning experiences is understood to relate to their *cognitive* (think hard), *affective* (feel good), and *operative* (work toward being more productive learners) engagements that need to be occurring simultaneously at high levels (Munns et al., 2013). Hence, codes of "cognitive engagement," "affective engagement," and "operative engagement" can be derived as another codebook for deductive coding and depicting students' CFL learning engagement, linking to another part of the research question.

Table 1. An Overview of Data Sources.

Data Sources	Data Descriptors	Theoretical Frameworks	The Research Question
Observation and research journals	A delineation of pedagogic practice	Bernstein's classification and framing	Address the "pedagogy" part of the research questions
Student focus groups	Students' learning experiences and narratives of identities	The FGP's engagement framework	Address the "students' Chinese learning engagement and identities" part of the research question
Classroom teacher's semistructured interviews	Classroom teacher's perspectives toward pedagogic practice and students' learning experiences	The FGP's engagement framework	

Note. FGP = Fair Go Project.

Data Collection and Data Sources

In addressing the research question of how does pedagogy exert an influence on students' Chinese learning engagement and identities, data were collected from a government primary school situated in the Greater Western Sydney area, New South Wales, Australia. The students, teacher-researcher, and classroom teacher who participated in this practitioner research were all studying and working at the school. Cultural and linguistic diversity and low SES were two defining characteristics of the school's catchment area. Data were collected from a Year 5/6 class, with students aged between 9 and 11 years over a period of two school terms, Term 1 and Term 2, of 10 weeks each. Chinese lessons occurred once a week for approximately 50–60 min.

Data collected included (1) observation and research journals, (2) student focus groups, and (3) classroom teacher's semistructured interviews. TA aligns with these data collection tools that seek to explore the events, meanings, and experiences from verbal interviews and textual data (journal entries) generated by those experiencing them (Joffe, 2012; Vaismoradi et al., 2013). Table 1 outlines different types of data in relation to the theoretical frameworks and the research question.

Observations and Research Journals

We worked with participants during the CFL lessons, observing the events, taking an insider's perspective to document classroom practice, and jotting down our reflections. Classroom observations were recorded in research journals after each day's teaching to capture the firsthand experience of the research. This process led to the generation of 18 research journals recording 18 lessons based on weekly lessons, providing a thick description of what happened in the natural classroom setting and producing raw data for the analysis of classroom practices.

Students' Focus Groups

Focus groups were undertaken to gather data from student participants because students can come together in conversations. Allowing them to engage in their own social and cultural world can enhance their involvement. The recruitment resulted in 14 students volunteering to be involved, and some students participated in more than one focus group. The four rounds of students' focus groups were conducted in the middle and end of each term. Each focus group interview had four to five participants and lasted approximately 20 min.

Classroom Teacher Semistructured Interviews

Semistructured interviews were chosen for the classroom teacher who observed the lesson, while retaining a set of core questions for the interviews. The interviewee had the flexibility and freedom to expand answers and introduce additional issues that may have steered the research into new pathways. Classroom teacher interviews were conducted at the end of each term for approximately 30 min each.

Working With the Data

This section provides a detailed, pragmatic example of a hybrid approach to interpreting multiple data collected from the classroom. Analysis techniques were hybrid in that both theory- and data-driven codes were created to assist in the coding of research journals and interviews. To be more specific, driven by our interests in sociological accounts of education, a deductive way was applied to research journals. It provided a rich description and detailed analysis of the "pedagogy" aspect of the data. Furthermore, both "top-down" and "bottom-up" approaches were chosen for interpreting students' engaging learning experiences and identities stated in focus groups and teacher's interviews. In this manner, such a hybrid method not only addressed CFL learning experiences and identities aspect of the research question but also enabled to identify themes strongly linked to the data themselves.

A further note on working with the data is that though the data were saved in the Word document electronically, we used traditional tools such as pens, highlighters, and post-it notes to read and analyze the printed data. Although digital analysis software packages such as NVivo scaffold data management, analysis, and write-up (Maher et al., 2018), Basit (2003) argues that the choice will be made contingent on the size of the project, availability of time and funds, and preference and expertise of the researcher.

The following section is organized around the six steps of the process and seems to be static and linear; nevertheless, it

Table 2. A Summary Table of Codes.

Data Sources	Codes	Types of Codes	Codebooks	Themes
Observation and research journals	Stronger classification (C+), weaker classification (C−), stronger framing (F+), and weaker framing (F−)	Deductive codes	Codebook 1	Pedagogic practice
	Fluctuating framing (F∼)	Inductive code		
Students' focus groups	Cognitive engagement, affective engagement, and operative engagement	Deductive codes	Codebook 2	Engaging learning experiences
	For example, "I am good at doing Chinese," "We have improved more," I am a beginner, and Chinese is helpful in future	Inductive codes	Codebook 3	Learner identities
Classroom teacher's semistructured interviews	Cognitive engagement, affective engagement, and operative engagement	Deductive codes	Codebook 2	Engaging learning experiences
	Work hard and "hard on themselves"	Inductive codes	Codebook 3	Learner identities

Table 3. Codebook 2 for Analyzing Students' Engaging Learning Experiences.

Code Name	Definition	Example
Operative engagement	Involvement in activities and following instructions	"Everyone did it every day and they've gone and played them"
Affective engagement	Positive feelings about lessons and learning activities	"It's fun"
Cognitive engagement	Thinking and willingness to tackle challenging ideas and skills	"They are no longer satisfied with simple characters like one, two, and three. They wanted to challenge more."

should be acknowledged and read with consideration of the cyclic, iterative process that occurred in the data analysis stage.

Step 1: Familiarizing Yourself With Your Data

The process of transcription is a vital step in data analysis within a qualitative methodology (Braun & Clarke, 2006). Transcription of focus groups and the classroom teacher's interviews occurred immediately after each interview, and the transcripts were double-checked with the participants informally. However, in practitioner research, the step of familiarizing oneself with the data can go beyond transcribing verbal data into written form and expand to observations of classroom practice and writing of research journals by the teacher-researcher himself or herself. In this research study, the initial engagement with the data assisted in noting emerging preliminary themes throughout the data set, which led to more in-depth analytic work. It also provided a source of inspiration for the planning of day-to-day teaching.

Step 2: Generating Initial Codes

As previously mentioned, codes were both theory driven and data driven in this practitioner inquiry. Table 2 provides a preview of different types of codes and their applications to three data sources. We will demonstrate each step we took to create codes and codebooks afterward.

The code-generating step was imbued with cyclic, iterative cycles of organizing data into meaningful groups (Tuckett, 2005); thus, it is crucial to determine which data set to start with. We turned to the research journal first as it implicates

students' learning experiences and identities stated in focus groups and interviews. Based upon Bernstein's classification and framing, stronger classification (C+), weaker classification (C−), stronger framing (F+), and weaker framing (F−) were developed as theory-driven codes constituting Codebook 1. Then, the codes of cognitive engagement, affective engagement, and operative engagement derived from the FGP composed Codebook 2 for analyzing students' engaging learning experiences. Both Codebook 1 and Codebook 2 include code name, definition, and example, and Table 3 presents an example of our deductive codebook.

Two coders reviewed the deductive codes in the context of the data through a couple of email correspondences and meetings. Comparisons and discussion on codes were persistently carried out in order to reach a unanimous agreement and demonstrate rigor in the study (Roberts et al., 2019). For example, codes of F+ and F− were assigned to raw data to tease out pedagogical relations between the teacher and students, which generated an additional inductive code in Codebook 1. We found in some learning activities, pedagogy was not featured as a dichotomy of either being strongly framed or weakly framed but was a flow between teacher-directed and student-centered approach. Hence, fluctuating framing (F∼) was coined to descriptively define another approach to teaching, and the process of code creation became more recursive, moving beyond the illusion of being linear and static.

After generating theory-driven codes/codebooks, we moved to the creation of data-driven codes—Codebook 3 for interpreting learner identities. This meant looking for different themes from the same data source (students' focus groups and teacher's interviews) as Codebook 2, and inductive coding was

applied to interview transcripts. Reading line by line, raw information was reduced to into smaller units (Saldana, 2016), and we endeavored to identify themes within subsamples (DeCuir-Gunby et al., 2011). For instance, we noticed some students considered themselves as capable CFL learners and stated that "I am good at doing Chinese," while others perceived that they were just beginners. In addition, students frequently talked about how Chinese would benefit their future employment, which was confirmed by the classroom teacher. Such iterative comparing process was across subsamples, and we used both "in vivo" codes and descriptive codes to capture participants' narratives of learner identities. The last step involved in developing data-driven codes was to determine the reliability of the codes. We repeated the same procedures carried out in generating theory-driven codes, including discussing definitions and examples of the codes and assigning them to the raw data.

Finally, three codebooks—Codebook 1 for unpacking pedagogic practice, Codebook 2 for interpreting engaging learning experiences, and Codebook 3 for understanding learner identities were composed as an initial list of codes for further reviewing and revising.

Step 3: Searching for Themes

The searching for themes step involves considering how relevant codes could be sorted, collated, and combined to form an overarching theme (Nowell et al., 2017). It commenced after the data set had been initially coded, with the development of preliminary codebooks. In this practitioner inquiry, when engaging learning experiences and learner identities coded in interviews were conflated with pedagogic practices interpreted in research journals, potential themes began to emerge. For instance, in focus groups, the code of "affective engagement" was attached to the statement of "it was really fun to fly kites" in the CFL lesson. We went back to the research journal recording the kite lesson and searched for how pedagogy practice was coded. It was found that most students did not fly kites before (C+) and the teacher-researcher adopted a student-centered approach (F−) to enable students to fumble through trial and error. As such, a potential thematic map was created in our mind—a clear-cut boundary of curriculum and student-centered approach seems to facilitate students' affective engagement. Table 4 illustrates an example of an initial thematic map developed in Step 3.

Table 4 succinctly shows an association between classroom practices and students' different dimensions of engagement. Classroom practice characterized by stronger classification (C+) and stronger/weaker/fluctuating framing (F+/F−/F∼) contributed to different dimensions of student engagement. A combination of weaker classification (C−) and weaker framing (F−), however, led to disengagement.

In addition, inductive codes extracted from the raw data also contributed to the formation of another thematic map with regard to learner identities (Table 5).

At this stage, a collection of candidate themes and a "miscellaneous" theme was created in relation to different

Table 4. An Initial Thematic Map Associated With Classroom Practices and Student Engagement.

Classroom Practices	Engaging Learning Experiences
C+F+	Cognitive engagement
	Operative engagement
C+F−	Affective engagement
C+F∼	Affective engagement
	Cognitive engagement
C−F−	Disengagement

Note. C+ = stronger classification; C− = weaker classification; F+ = stronger framing; F− = weaker framing; F∼ = fluctuating framing.

Table 5. An Example of an Initial Thematic Map Associated With Learner Identities.

Codes		Themes
"I am good at doing Chinese" easy	→	Knowledgeable, capable CFL learner
I am improving	→	Optimistic views toward CFL learning
I am a beginner Not satisfied with knowledge retention "I feel not very confident"	→	No confidence
Chinese is helpful in travel Chinese is helpful in employment	→	Chinese is helpful in future

Note. CFL = Chinese as a foreign language.

codes. The "miscellaneous" theme was used to house the codes that did not appear to fit into main themes (Braun & Clarke, 2006). Themes and codes were listed and organized on thematic maps to help us think about "the relationship between codes, between themes, and between different levels of themes" (Braun & Clarke, 2006, p. 89).

Step 4: Reviewing Themes

Step 4 is characterized by reviewing and refining of the themes, as we returned to the raw data and used the "compare-and-contrast" method to ensure the developed themes were grounded in the data (Boyatzis, 1998; Lincoln & Guba, 1985). In Braun & Clarke's (2006) paper, this reviewing phase involves two levels. Level 1 refers to read and ascertain that the data extracts appear to form a coherent theme; Level 2 is concerned with considering whether the candidate thematic map accurately represents the meanings in the data set as a whole.

When performing the Level 1 of Step 4 of reviewing themes, we recognized that some codes that were previously placed in the "miscellaneous" theme have relations to the key themes, and they did capture something important in addressing the research question (Braun & Clarke, 2006). For instance, some students stated that "We could only have one" and "We need more lessons." These "in vivo" codes seem to be irrelevant to either learning experiences or the formation of learner identities. However, after rereading, recontrasting, and rethinking of

Table 6. An Example of a Reviewed Thematic Map Associated With Learner Identities.

Codes		Themes
"I am good at doing Chinese" Easy	→	Knowledgeable, capable CFL learners
I am improving	→	Optimistic views toward CFL learning
I am a beginner	→	~~No confidence~~
Not satisfied with knowledge retention		↓
"I feel not very confident"		*** High expectations on CFL learning**
"We could only have one"		*** Need more lessons**
"We need more lessons"		
Chinese is helpful in travel Chinese is helpful in employment	→	Chinese is helpful in future

Note. CFL = Chinese as a foreign language.

the raw data, we perceived that it was mostly girls who claimed these, and actually they were doing well or even better than other students. The classroom teacher also confirmed in the interviews that girls worked hard and were "hard on themselves." Hence, we moved from the surface meaning toward a richer description of the data; that is, some students had high expectations on their CFL learning, and their confidence and knowledge retention can be improved through more lessons. In this sense, the revised theme seems to more appropriately reflect participants' voices and capture the contours of the coded data. Table 6 marked changes made to the thematic map outlined in Table 5.

Level 2 was concerned with a similar process but in considering the validity of themes in the entire data set. This level of reviewing themes may still involve reworking on codes and themes, that is, to code additional data that omitted in previous coding stages and to ascertain whether the themes fit into the data set.

Step 5: Defining and Naming Themes

By defining and naming themes, Step 5 means determining the essence of each theme and organizing them into a coherent and consistent account (Braun & Clarke, 2006). It is also crucial to fit each theme into a broader overall story about the data, and overlap is supposed to be avoided. For instance, Table 4 describes that stronger classification (C+) and weaker framing (F−) contributed to students' affective engaging learning experiences. The account can be developed as how strongly classified curriculum looked like; that is, students did not use chopsticks before; how weakly framed pedagogy was performed; that is, students were organized into groups to experiment on using chopsticks to pick up marbles and peers supported each other; and students described such learning experiences as "fun," "happy," and "enjoyable."

By the end of this step, we could clearly name what themes are and what they are not. In addition, names of each theme were reconsidered at this stage, striving for being concise and precise.

Step 6: Producing the Report

With a set of fully established themes, the data analysis moved to the write-up step. Themes emerging from the data and prior research were analyzed and discussed, juxtaposing against pertinent literature. As this practitioner inquiry drew upon multiple data sources (observation and research journals, students' focus groups, teacher's interviews), it is pragmatic to embed and distinguish both our commentary and participants' voices to demonstrate the rigor of the themes. The report revolved around our analytic narratives and selected examples capturing the essence of the data with quotes directly from participants (Fereday & Muir-Cochrane, 2006). Some were chosen because they were prevalent throughout the transcripts and particularly representative of many voices, and some were chosen because of their uniqueness in pointing out a fresh new point of view that informed the individual learning experiences. A panorama approach, taking participants as a whole, was adopted at times since the inquiry sought to understand students' learning experiences against a backdrop that positioned the individuals socially and culturally within their school, familial, and local environment. Literature was used to confirm as well as compare examined evidence in reporting the data. As a result, the report incorporated and interwove our accounts, quotes from different data sources, and literature conceptually (Creswell, 2009; Yin, 2018) to tell the rich story of data and make a compelling argument in relation to the research question (Clarke & Braun, 2014).

Discussion

Based on our analysis, we argue that a hybrid approach to TA assisted us in identifying the most basic element of the raw data (Boyatzis, 1998) but also in flexibly discovering both descriptive meanings and interpretive meanings that appeared interesting and relevant to the research agenda. For instance, the deductive codes of "affective engagement," "cognitive engagement," and "operative engagement" contributed to our understanding of students' engaging CFL learning experiences in a predisposed theoretical framework. However, the inductive coding process enabled a thicker and more comprehensive elaboration on the bulk of the data (Joffe, 2012). The "in vivo" codes such as "We could only have one" and "We need more lessons" indicated students' overall engagement as they aspired to have more CFL lessons but also illuminated their high expectations on learning as well as explicated why their knowledge retention was weak. As such, a hybrid analytic process went beyond generating initial codes on the semantic level and involved a progression to identify and examine latent meanings. We accord with Braun and Clarke (2006) that TA is flexible enough, and a hybrid approach is one of its most prominent advantages in carrying out the practitioner inquiry.

Our second point relates to rigor in research. Although the insider's role afforded us the privilege to gain empathy, trust, and rapport in the school setting, it had the potential of impeding the research process and covering up evidence. The teacher

as researcher status might bring about the undue influence of personal bias and perspectives in the process of TA, which was acknowledged as a limitation of this study. However, as two coders were engaged in the generation and testing of the codebook as well as reviewing themes, a clear trail of evidence for the validity and interrater reliability has been improved (Roberts et al., 2019). Additionally, memo writing was conducted concurrently in the process of analyzing and presenting data (Gray, 2014), and we continuously bent back on ourselves—querying and reflecting at the intersection of data, theories, data analysis, and subjectivity (Braun & Clarke, 2019). A constant revisiting of theory necessitated the development of theory-driven codes, while the generation of data-driven codes drove us to repeatedly examine the raw data (DeCuir-Gunby et al., 2011). It was our reflexivity and prolonged engagement with data and analytic process that led to a thicker description of this particular practitioner inquiry, contributing to transferability and dependability as criteria for evaluating qualitative studies (Maher et al., 2018).

A final note pertains to data saturation. Saturation is an elastic concept (Morse, 1995), and the crux of our discussion is to clarify when and how data saturation was reached in our practitioner inquiry. Ryan and Bernard (2003) assert that kind of data types, analysts' expertise, and required labor are the three factors that determine saturation. When writing up research journals and transcribing interviews, we acted as a kind of theme filter and commenced to categorize the significance of data. However, considering the number and complexity of data (18 research journals and 6 interviews; Guest et al., 2006), we felt it was too soon to finalize our codebooks in Step 2 which might run the risk of missing important information. Thus, we worked out three preliminary codebooks for further reviewing when rendering themes. We persistently went back to engage in a richer, more nuanced reading of the data in Steps 3, 4, and 5 as reflexivity was practiced. Code definitions also changed as our analysis and understandings progressed, especially when conflating various data sets and taking up a panoramic view of the entire data. In this respect, data saturation also depends on researchers' experience and the number of analysts involved in processing data. In some cases, codebook revisions are completed in the data collection process (Guest et al., 2006). However, we argue that our postcoding and post hoc rearrangement of codes did not affect saturation per se—since the scope and key themes in the codebook did not change—but it did impact on how we interpret and present the data.

Conclusion

This article has described a detailed example of a hybrid approach to TA, and initial codes were driven by both data per se and theories. Therefore, each unit of analysis allowed the participants to express themselves but also explicitly drew upon theoretical frameworks which strongly articulated that part of the data and best facilitated a close-up analysis of the phenomenon. The reported example does not perfectly adhere to the rules of undertaking analysis, as the research analysis is

an iterative and reflexive process (Braun & Clarke, 2019; Fereday & Muir-Cochrane, 2006) and fraught with an "interplay among the process of data collection, literature review, and researcher introspection" (Tuckett, 2005, p. 78). However, the example is flexible enough to provide step-by-step guidelines on the process of data coding and theme development when considering multiple data collection tools and the associated analytical stages. It can assist beginning qualitative researchers, especially teacher-researchers and educational researchers in making active decisions on and applying their particular form of analysis to practice in their natural classroom-based research.

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