

ENHANCING PEDAGOGICAL CONTENT KNOWLEDGE: AN EXPLORATION OF EXPERIENCED ESL TEACHERS' COGNITION ON ADVERSE CLASSROOM CLIMATIC CONDITIONS IN SABAH, MALAYSIA

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ABSTRACT

The effects of global warming and climate change are well known to human activities. The classroom's climatic conditions in which teachers work have a significant impact on their cognition and practices in second language education. The decisions about content, curriculum and pedagogy are made based on their pedagogical content knowledge (PCK) enhanced by the teaching experiences gained in classroom practices. The purpose of this study is to explore experienced teachers' cognition on adverse classroom climatic conditions which influence their decision making for teaching practices. The primary goal is to enhance ESL teachers' PCK base in deciding appropriate content, curriculum and pedagogical strategies under specific climatic condition. Interpretative Phenomenological Analysis (IPA) is used to analyse the lived experience of three experienced ESL teachers in secondary schools located in coastal areas of Sabah, Malaysia. Data collection methods and sources included field notes, interviews and document analysis. The findings revealed that thermal comfort and mental efficiency are the vital factors besides other classroom milieu that need to be considered when deciding appropriate content and pedagogical strategies for a specific lesson. Furthermore, the findings suggested three aspects of PCK; the knowledge of students' affective needs, conceptions of content and curriculum, and knowledge of instructions and appropriate teaching strategies; are also influenced by the climatic conditions surrounding the classroom.

Keywords: Pedagogical Content Knowledge (PCK), English as a second language (ESL), English language teaching (ELT), climatic conditions

Introduction

The impacts of global warming and climate change on human activities have been widely discussed in many fields including ESL education. However, most of the discussions related to this phenomenon are based on studies done in countries which are climatically different from Malaysia. For that reason, there is a need for studies to address this issue to increase teachers' awareness in dealing with weather-related difficulties in classroom. It has been a great challenge for many ESL teachers to deal with their practices under adverse climatic conditions. In academic research of ELT, there is a lack of studies addressing the perceptions, personal meaning, affect and experience surrounding climatic conditions. Teachers' belief, knowledge, judgements, and thoughts have an effect on the decisions they make which influence their plans and actions in the classroom (Fennema & Franke, 1992). Several researchers (Shulman, 2002; Mullock, 2006; Sindhu, Fook, & Kaur, 2011) stressed that although there have been studies addressing teachers and students learning, there is limited empirical research conducted on teachers' pedagogical and content base knowledge and how they use content knowledge to make sense of their classrooms in their natural setting. Thompson (2004) suggests that classroom teachers urgently need to learn more effective strategies to teach English learners. To this extent, "the most obvious beneficiary of an increased understanding of second language acquisition is the second language teaching profession, and through the teachers, the students themselves" (Freeman & Long, 1994).

As an effort to better understand and learn about how teachers reason their decisions and actions under adverse climatic conditions, this study discusses the lived experiences and cognitions of three experienced ESL teachers regarding to the issue from local context. The reason why experienced teachers are selected to participate in this study is based on Johnson's (1999) notion:

...unlike experienced teachers, novice teachers had not developed a schema for interpreting and coping with what goes on during instruction, nor did they possess a repertoire of instructional routines on which they could rely (p.57).

The purpose for this study was twofold. First, this study sought to recognize the impacts of adverse climatic conditions in ESL classroom.

Secondly, this study is looking for reasons hold by participating experienced teachers in deciding the pedagogical strategies for such conditions.

In addition, we need to look beyond plainly describing the situation in language classrooms and move further by looking at how experienced teachers deal with difficulties to help students learn ESL. Toward this objective, this study is looking deeply at teachers' cognition, pedagogical content knowledge and decision making at one secondary school in Sabah. The intent of this phenomenological study was to build broader understanding of ELT practices in adverse climatic conditions.

The Challenges

Goodlad (2004) states that how teachers teach and the circumstances surrounding the teaching determine the effectiveness of the learning. It occurs that both teachers and students are conditioned by the different physical settings there are in. The physical aspects such as temperature, noise and the time of the day affect humans' focus, concentration and attention maintenance in teaching and learning process (Kumar, 2012). Some researchers used the terms such as learning environment, learning situation, physiological psychology, ecological psychology, behaviour settings and some other terms that can be used to describe the relationships of physical settings and how it influences teaching and learning. In this study, the term climatic condition is used to describe the physical situation related to weather condition in ESL classrooms.

One of the challenges faced by ESL teachers is to teach students in language classrooms that are thermally uncomfortable. Making this a more critical issue, several studies (Landsberg, 1987; South, 1990; Wang & Wang, 2006; Kumar, 2012) reveal that thermal comfort is associated with physical and physiological conditions which influence humans' mood, emotion, mental efficiency, attitude, behaviour and actions. Smith and Bradley (1994) reveal that under conditions of thermal discomfort performance decrements may occur on a range of academic pursuits, including arithmetic, reasoning, and concept acquisition tasks. Other literature findings on teacher judgements revealed that, on hot days, students' behaviour is described as low energy, less progressive and low productivity level. Teachers' and students' performance deteriorates in unpleasant thermal conditions. Kevan and Howes (1980) reported students' learning is more efficient in conducive air-conditioned room and teachers'

preferable classroom temperature is approximately 21°C. They suggested that classroom temperature should be maintained within 22°C-24°C range for teachers and students to work best in classroom activities given the consideration of the level of activities and students' metabolism rate. They also highlighted that most people feel comfortable when effective temperature is within the range of 20°C-22°C. At the temperature of 25.5°C, most people will begin to sweat, and from 26.6° onwards, they will find it difficult to maintain concentration and work on given tasks. A report by McBer (2000) highlights this issue:

Natural surrounding covers the climatic and atmospheric conditions. These conditions affect learning directly. It has been found that high temperature and humidity reduces mental efficiency. For a limited time, humidity and high temperature can be tolerated but prolonged humidity and high temperature become unbearable and decrease mental efficiency. The intellectual productivity and creativeness of people living in hot regions are much low. Likewise, the morning time is always better for mastering difficult tasks. Mental efficiency decreases due to increased humidity and temperature. Studies on the academic progress of evening school show losses of efficiency varying from one to six percent.(p.54)

From the report, we can see that there is a direct link between thermal comfort and mental efficiency. The term mental shares similar definition with cognitive in some respects. Dörnyei (2010) made particular emphasis on the cognitive system in second language learning. He stressed that with regard to mental functioning, cognition is associated with knowing and knowledge representations, memory, attention, learning, information processing, abstract thinking, appraisal, judging, reasoning, problem-solving, decision-making and even motivation and affect. The cognitive faculty in second language learning interact with various aspects of environmental, and the complexity of this relationship is what made second language learning even more difficult to be elaborated. Sharma, Pichan, and Panwar (1983) found that all psychological functions were adversely affected under extreme heat, and there was significant drop in various psychological functions observed at temperature ranging from

32.2°C and 33.3°C in hot-humid and hot-dry conditions respectively. In addition, they have pointed out that all cognitive functions studies in their research showed extensive deterioration at the same temperature after an exposure of 100 minutes. Stokols & Altman (1991) stressed that uncomfortable heat affect performance by drawing attention away from the task. Kevan and Howes (1980; cited in Smith & Bradley, 1994) argued that ambient temperature above 30°C weaken mental performance, perceptual and psychomotor tasks.

In reality, with the temperature ranging from 26°C to 35°C daily, teachers are facing hard times to achieve their teaching objectives. We do understand that students' learning will be better if they enjoy the lesson, but to ensure enjoyability in inconducive classroom conditions is a huge burden for teachers. When everything else fail, the alternative taken is to 'force' the students to remember what was explained by the teacher and to drill them with tonnes of past year questions to polish their answering skills other than mastering the language by understanding. If we continue to believe that our teachers and students should be flexible and adaptive to climatic conditions they are in, we will continue to have problems in ensuring successful teaching and learning. It is important for us to seek for understanding and learn from those who have experienced and successfully dealt with such situation. It is believed that teachers' decisions and actions are conceptualized by the experiences gained in their workplace. According to Johnson (1999), experienced teachers possess "a repertoire of instructional routines on which they could rely" and are able to sense whether the teaching should proceed as planned or immediate decisions should be made.

Conceptual Framework

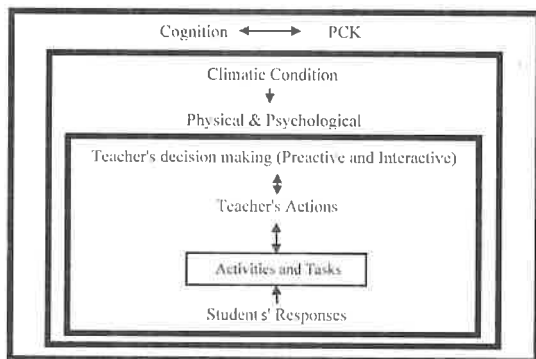


FIGURE 1: The Conceptual Framework: Conceptualizations and ELT practices

The conceptual framework was adapted from William and Burden's (1997) social constructivist model of teaching-learning process and the framework of teacher conceptualizations and classroom practices proposed by Breen et al (2001). In the process of ELT, the interaction between teacher, actions (pedagogical strategies, activities, tasks) and students occurs in a context of climatic condition which influencing the physical and psychological environment. This context represents a concentric space that influences each other, where teachers' actions are being shaped by the environments.

The study of language teacher cognition - what language teachers think, know and believe - and of its relationship to teachers' classroom practices has taken its place since 1980's (Borg, 2006). This includes theoretical and practical understanding of a teacher towards conceptualizing his or her teaching by acknowledging facts and information or awareness gained by experience of a situation. One particular issue that has clouded the effort to conceptualize and measure the knowledge base for teaching has been the perceived distinction between teachers' subject matter knowledge and teachers' knowledge of general pedagogical principles and practices (Rowan, et al., 2001). The link between the thought and psychological process of teachers and the way they conceptualize their actions is an important element in language teaching, and form a ground in their PCK base.

Pedagogical Content Knowledge (PCK) propagated by Shulman (1987) has a large impact in conceptualizing the link of teacher cognition and classroom practice. McCaughtry (2005) pointed out that since the past decade, PCK has emerged as a prominent and insightful feature in understanding teachers' thinking and decision making. By definition, PCK is knowledge of the ways of representing and formulating the subject that makes it comprehensible to others. PCK has provided a 'know-how' knowledge in teaching by integrating the three components into an understanding for decision making of what and how to teach in a particular classroom. It is believed that once a teacher managed to identify the idea about language or language learning that lies behind a particular classroom activity, then the teacher is in a position to make judgement about how valid it is from his or her point of view, and if it is how it might be put into practice by an alternative activity more suited to the teaching situation (Widdowson, 2010).

Teachers play a crucial role as active thinking decision-makers who made sense of a various display of experience in their work. This

cognitive dimension of teaching becomes the guiding principle for teachers to aid them in planning, problem solving, judgement and decision making on how to act and perform in the classroom. There is a strong connection between what teachers think and their pedagogical decisions. Clark and Peterson's (1986) work aimed to highlight the relationship between teacher thinking and teachers' work. The concern was put in the context of teaching, not just in decision making but emphasizing to describe teachers' action in classroom settings. They outlined three thought processes of decision-making in teaching; pre-active decision-making and post-active decision-making, interactive decision-making and teachers' theories and beliefs; which is portrayed as the unobservable psychological context of teaching. Pre-active and post-active decision-making is referring to the planning of teaching, while interactive decision-making is referring to decisions made in actual classroom (Clark & Yinger, 1987; cited in Calderhead, 1987). The cyclical nature of teachers' thought processes determines teachers' actions in classroom. The model also highlighted the implication of constraints and opportunities face by teachers in their work, and attention to these factors would increase the understanding of teachers' thoughts and actions (Borg, 2006), which in this study concern on adverse climatic conditions.

Research Questions

In this study, questions were developed to disclose teachers' cognition and gain insight their PCK base guided the decision making. Two research questions were posed as follows:

1. How do experienced ESL teachers describe the impact of adverse climatic conditions on teachers' work?
2. What are experienced ESL teachers' reasons of their actions when teaching under adverse climatic conditions?

Methodology

This study utilized phenomenological research design to answer the research questions. According to Schram (2003) and Creswell (2007), phenomenological study is about investigating the lived experience of individuals which is described by how they make meaning of the phenomenon they experience. Interpretative Phenomenological Analysis

(IPA) is used as a distinctive and emerging approach to qualitative inquiry (Smith & Osborn, 2008). IPA is an inductive and experiential approach to research methodology (Smith, 2004) which focuses on exploring and discovering how people make sense of their lived experiences of personal reality, in order to understand the meanings they assign to those experiences (Smith & Osborn, 2008).

Research Setting

As one of the states in Malaysia, Sabah is experiencing a typical equatorial climate, with steady temperature and considerable amount of rain and high humidity. The climate change due to the global warming phenomena has made it extremely difficult to accurately forecast the weather in the north of Borneo. Compared to Peninsular Malaysia, the warming rate for East Malaysia was relatively higher, which the warming rate for Kota Kinabalu was 3.44°C/100 years (Ng, Camerlengo, & Ahmad, 2005).

Due to its topography, most populated towns in Sabah are detained within the coastal areas. The population are exposed to sea and land breeze which influence the raises the day temperature. During the day, the sun heats the surface of the land and the sea. Water absorbs a lot of heat, so the air over the sea is cooler than the air over the land. Warmer air over the light is light, therefore it rises and causes the air pressure over the land to be lower than that over the sea.

The research site was a secondary school with approximately 1950 students and 121 teaching staffs, located at coastal area in Sabah, Malaysia. The school is considered a normal rural daily school even though it is located 25 kilometres from the capital city of Sabah. Due to the large enrolment of students, the school follows two-sessions schooling system. The morning session begins at 7.00 am and ends at 12.20pm, while the afternoon session begins at 12.20pm and ends at 5.40pm. Currently, the school offers places for form one to form six students.

Participant Criteria and Selection

Earlier we highlighted the need to learn how experienced teachers managed to persist in spite of this natural barrier. Based on this criterion, purposive sampling using criterion-based selection is employed. Merriam (1998) explains that in criterion-based selection, the sampling process is done by

seeking potential participants that meet the "list of the attributes essential to the study and "proceed to find or locate a unit meaning the list". Every participant is given pseudonym to protect their confidentiality. The first criteria of participants we were seeking are ESL teachers who possess more than ten years of experiences in ELT. The second criterion is the participants have good reputation and are termed as exemplary, excellent or reputable ESL teachers. Participants for this study were solicited during formal and informal meetings, courses and informal discussions.

The first participant, Ariessa is a 34 years-old teacher. She holds a degree in B. Edu (TESL) Hons. She has 12 years of teaching experience as she started to teach in 2001. She presently teaches upper secondary classes in the morning session. Mrs. Ariessa believes in behaviourism, and drilling would be her instrument to strengthen the language learning. She believes that her students need to do lots of exercises to master the language.

Balvind is a 44 years-old teacher with 18 years of teaching experience. He holds a B.Sc (Economics) and Diploma in Education (TESL). Balvind is a realistic person; he believes that students have an innate knowledge of the structures of language. For him, teaching needs to be more on self-exploratory, rather than depending on input from teachers. He viewed that second language learning does not work on everyone, and it requires abilities mentally to acquire the target language. Recently, he has just been awarded as Guru Cemerlang (Excellent Teacher award) for his remarkable contribution in education.

Corey is a 33 years-old teacher with 11 years of experience teaching English. She holds a degree in B. Edu (TESL) Hons. She is presently teaching in the afternoon session. She believes that in Malaysian context, performance in public examination is the main priority of all schools, therefore drilling and lots of practices are crucial for her to ensure her students to score well. She also believes that language acquisition on the other hand is not just answering questions in exams, as it is more to application in real-life context. These beliefs are taken into consideration when planning her lessons.

Data Collection and Analysis

Data were collected through observations and personal interviews. Field notes were taken during the observations and the interviews were transcribed for data analysis. The data collected in observations were used

for confirmation in interview sessions with participants.

All interview sessions were done immediately after the second observation. The interviews followed a semi-structured format which presented a conversational tone but were focusing on the research questions. Open-ended questions were used to allow teachers to explain describe their experiences and justify the rationale behind their actions and decisions in classroom practices.

Data analysis involved organizing data into manageable units of codes and themes, followed by synthesizing them to search for patterns (Bogdan & Biklen, 2006) and meaning making in the collected data (Miles & Huberman, 1994). The textural and structural (how and what) descriptions of participants' experiences were developed. Because the purpose of this study is to understand the lived experience of the participants, no comparisons were made between participants related to teaching effectiveness.

Results

How do English teachers describe the impact of adverse climatic conditions on teachers' work?

Thermal comfort

Each participant discussed their encounters regarding to thermal comfort in their classrooms. Thermal comfort is found to have significant influence in increasing students' affective filter which affects their psychological state. Ariesya knew that being thermally uncomfortable affect students' mood which hamper the learning process. In addition, she also admitted that she could not avoid from being sleepy in her classroom especially in the mid afternoon, so did her students. Her explanation was that in non-conductive climatic conditions, students should not work on language tasks, and teachers should not carry out language lessons as they are physiologically and mentally not ready. She believes that other less stressful subjects that involve experiments should be offered. As she is currently teaching low proficiency students, her students tend to ignore her and make noise rather than focusing to the tasks and activities in her classroom. This led her to be emotional and there are times she needs to "nag" and "punish" her students to control their behaviour. "Lazy", as Ariesya described her students, although I recalled that the same group of students managed to finish their

work in my first observation.

Balvind agreed that his students were also affected by the natural circumstances saying "it might affect the mood, one thing for sure". He explained further that as an ESL teacher, he himself could not avoid from being under influence of the condition surrounding his classroom. He made a strong emphasis by saying "When you teach in the morning, let's say early in the morning, you're in the mood of course and it's still early and you'll be more energetic". His students are more responsive when learning under conducive climatic condition. There are great tendency for students to be "passive", "quite" and "less responsive" in non-conductive conditions. He added that even teachers including him tend to be less interactive and attentive to students when he is thermally uncomfortable.

Correy on the other hand is more concern on students' physiological aspect. She explained that most of her students come from poor family background and working class communities, financial is a serious issue and burden. "To buy a proper meal for lunch is something that students cannot do every day" as she emphasized. She explained that even after recess, the energy level of this group of students deteriorate even before afternoon and evening classes. This is supported with findings by Smith and Bradley (1994) who revealed that on hot days, students' behaviour is described as low energy, less progressive and low productivity level. Making this a more critical issue, Correy explained that students' attitude and behaviour are depending solely in which condition they are in.

Mental Efficiency

Each shared their thoughts by recalling their experiences related to students' mental efficiency under adverse climatic conditions. In many aspects, mental efficiency is reinforced by thermal comfort in a specific condition. Ariesya discussed the differences of students' responses could be obviously seen depending the conditions they are in. She clarified that it is not difficult for her to engage her students to the tasks prepared for them, as they are "fresh" and "able to concentrate". In contrast to that, under non-conductive climatic conditions, she explained that her students were having difficulties to generate ideas especially in writing tasks by saying, "I think it's difficult for them to think about the points that they want to write". She emphasized that students' information processing meant for language activities is not well functioning in hot conditions as it affect the students'

concentration.

Balvind's description of his students was similar to Ariesya's views. He portrayed his students as "more ready" for language learning in conducive climatic conditions, as they are able to give better attention and able to process information in language classroom. He recalled that most of his students were able to engage to the tasks given to them and produce output in sufficient time.

Correy's experiences were similar with the other participants. She did not allude to students' mental efficiency directly, but agreed that her students performed better in conducive climatic conditions. Interestingly, her emphasis was more on the structure of timetable. She suggested that restructuring school's timetable would be helpful by allocating ESL subject in early morning.

What are experienced ESL teachers' reasons of their actions when teaching under adverse climatic conditions?

Knowledge of students' affective needs

One of the barriers in ELT is to lower down students' affective filter to ensure students feel comfortable to participate in a lesson (Johnson, 1999). Obviously, non-conductive climatic conditions increase students' affective filter. All participants have found it very difficult to select appropriate skills and tasks to be taught in non-conductive climatic conditions. Their primary consideration is to select skills or content that requires attention, information processing, abstract thinking, appraisal, judging, reasoning, problem-solving, decision-making and producing language output to be taught in conducive climatic conditions. Ariesya explained that she would teach writing skills as she claimed her students "can focus and be imaginative to write". She explained further that it is important not to create "threatening situation" by forcing students to write when they are not at their best. Balvind highlighted that concentration and ideas generating skills can only be obtained when they are comfortable. He felt it is important to consider students' affective filter prior to deciding what and how to teach in a specific classroom conditions. He recalled his failed lessons and called them "meaningless teaching" when he ignored the fact that students' affective need is associated with the conditions they are in. Reflecting his memory, he thought that his students would perform

accordingly if he forces them to be engaged to his lesson. Adding to his explanation, he emphasized that teachers need to know when to "manoeuvre" their teaching as long as the objectives can be achieved.

Likewise, Correy talked about the importance of making sure students involvement and understand the lesson by reducing their affective filter. Although she agreed that not much can be done about climatic conditions, but by choosing appropriate skills, content and activities might help in motivating the students to persist in spite of this barrier. "Fun learning" would offer great outcomes especially in getting the students to love language learning in any circumstances.

Conceptions of content and curriculum

During the interviews, each participant talked about the difficulties they faced in deciding what is best to teach and what are they were supposed to teach. In decision making process, all participants agreed that consideration should be placed in curriculum integration in selecting appropriate content, skills and teaching strategies. The need to ensure the sequence of lessons content based of prepared syllabus specifications is unavoidable.

Ariesya talked her difficulties in planning her teaching knowing that her timetable is scatteredly arranged. Despite noticing that morning would be the best time for her to teach, she admitted that she is bound to given curriculum. Rather than being "choosy" in her selection of content, she said that all left to her is to be creative in her teaching strategies to achieve the lesson's objectives.

Balvind complained that school administrators and authorities should consider the fact that climate change is directly influence language education. Bound to abide the teaching ethics, Balvind expressed by saying, "We cannot do much about it; we have to follow the syllabus given to us. We have to finish the syllabus no matter what, no matter how". Even he expressed the ambivalency within prepared curriculum and his ELT practices, he still believes that teachers know what and which content should be taught at a specific condition, and it depends on one's creativity to alter his teaching strategies.

Correy discussed how current curriculum limits her choices for ELT. She admitted that she cannot use fun activities for every lesson. There are times she need her students to produce language output despite knowing the fact that the condition they are in is not supportive for mental functions

meant for language tasks. Regarding this issue, she said that this is a great challenge especially when dealing with low proficiency students and hamper the overall objectives of the lesson.

Knowledge of instructions and appropriate teaching strategies

Reflection of past experiences proved to be worthy for all participants in decision making. In essence, the circumstances surrounding ELT should be taken into consideration and continually judge to evaluate the effectiveness of a particular strategy. Ariesya stressed how important for her to get students to involve in her teaching. She noted that she had to reconsider every strategy employed in previous lessons and carefully select strategies that can maximize students' participation. In non-conducive climatic conditions, she suggested that focus should be given more on eclectic approach in instructional strategies such as kinaesthetic activities. The selection for content or language skills to be taught must also be easier for the students to learn.

Balvind elaborated his teaching strategies as "engaging strategies". For him, alteration on teaching strategy should be made during teaching if he finds that it fails to engage students to his lesson. For years, he has made use of language games and task-based learning strategies to achieve his objectives, which he added, would work in any conditions.

Correy shared similar views with Balvind. In addition, she explained that she applied activities that involves movement and music which were found to attract students' attention. She explained that by encouraging students with games and music, learning is likely to be successful as students are more motivated and participated in classroom activities. Correy emphasized that it is crucial for teachers to be well planned for successful ELT.

Discussion

The findings from data analysis suggest that adverse climatic conditions have significant impacts in ELT practices. It became evidence that thermal comfort and mental efficiency are the contributing factors in classroom performance. Sharma, Pichan, and Panwar (1983) found that all psychological functions were adversely affected under extreme heat, and there was significant drop in various psychological functions observed at

temperature ranging from 32.2°C and 33.3°C in hot-humid and hot-dry conditions respectively. Likewise, mental efficiency is found to be decreased in non-conductive climatic conditions which hamper the teaching and learning process. Stokols and Altman (1991) stressed that uncomfortable heat affect performance by drawing attention away from the task.

On the other hand, students' affective needs and appropriateness of teaching strategy are found to be important considerations for ELT in adverse climatic conditions. Lowering down affective filter is crucial in getting the students to be comfortable and increase motivation towards language learning. It is also found that teachers consistently evaluate their effectiveness by judging teaching strategies employed in ELT. Interactive decision making is needed to alter teaching strategies to ensure objectives of the lesson can be achieved. The teachers view the under adverse climatic conditions, the congruence between skills and pedagogical strategies is very important. Based on their cognition, teachers carefully select the approaches, methodology and strategies for teaching which are, in their view, most effective and suitable for their students.

Conceptions of content and curriculum reveal several constraints which caused ambivalency in ELT practices. Teachers are demanded to abide the specifications although knowing the fact that there are conditions where teachers could not function effectively due to the present structure of school timetable. Nevertheless, teaching experiences have helped the participants to conceptualize a solid ground of informed theories in deciding what is best for their ELT practices within the classroom context. As a conclusion, there is no doubt that past experiences proved to be essential for rationalising the decisions made in ELT practices by enhancing their PCK base. It appears that all participants managed to persist their teaching despite the barriers they faced due to current natural phenomena. At the end of the day, it depends on the teachers to decide on appropriate content and instructional strategies to be delivered in adverse climatic conditions classrooms.

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