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Vuong Thi Hoan: Oral performance in online foreign language classes: An idiodynamic approach to capture moment-to-moment changes in learner anxiety
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Oral performance in online foreign language classes: An idiodynamic approach to capture moment-to-moment changes in learner anxiety

Emotions are known to last for a limited period before the individual transitions to a different emotional state (Boudreau et al., 2018), and it can be assumed that anxiety also exhibits this phenomenon. The present study aims to depict the dynamics of EFL learners' anxiety at the per-second timescale during an online oral language task and determine potential explanations for these fluctuations by employing the dynamic systems theory and the idiodynamic approach developed by MacIntyre (2012). Firstly, seven Vietnamese secondary school students were administered a questionnaire to measure their online classroom anxiety and were then videotaped while performing oral tasks. Next, the participants rated their anxiety levels using a software called Anion Variables Tester v2. Finally, they were asked to explain changes in their anxiety in the post-task interviews. The findings revealed that both similarities and differences in anxiety levels were captured among the relatively homogeneous group of participants. The learners attributed fluctuations in anxiety to their self-confidence, topic familiarity, task complexity, the emergence of numerous ideas, language proficiency, satisfaction with performance, dishonesty in responses, and internal and external readiness. The findings of this study can benefit teachers in selecting strategies to facilitate learners' positive emotions and sustain their active participation during speaking activities utilized in online classes. Finally, several limitations were identified and discussed in this paper.

Keywords: language anxiety, idiodynamic, oral performance, online communication, dynamic systems theory

1 Introduction

In recent years, developing specific language skills has attracted significant interest and investment from the Vietnamese Ministry of Education and Training (MOET). Multiple policy documents have been issued to enhance learners' language skills. Among the relevant documents, the Official Dispatch No. 32/2018/TT-BGDĐT, which thoroughly describes the framework of the General Education Program (GEP) 2018, places heavy emphasis on the comprehensive development of language skills (i.e., listening, speaking, reading, and writing) to achieve effective communication (Vietnamese Ministry of Education and Training, 2018). However, recent evidence has indicated several challenges in achieving these goals. For instance, Pham et al.

(2022) revealed that Vietnamese students lack confidence in English presentation skills. Furthermore, the Education First (EF) English Proficiency Index reported that Vietnamese learners have low English proficiency and ranked 60th out of the 111 surveyed countries (Education First, 2022). Such findings have led researchers to examine the underlying causes of these issues. While several studies have been conducted at the university level (Huynh, 2021; Le & Tran, 2020; Tran et al., 2013), little attention has been paid to K-12 students. Therefore, this study aims to examine the EFL oral performance of secondary school students in an attempt to bridge the existing research gap and contribute to a deeper understanding of this issue.

Learners' in-class oral performance has been shown to be influenced by several factors, including age, motivation, language aptitude, cognitive abilities, anxiety, and L1 interference (Aida, 1994; Coulombe, 2000; Horwitz et al., 1986; Kim, 1998; MacIntyre & Gardner, 1994; Saito et al., 1999). Among these factors, anxiety has attracted considerable attention from researchers in foreign language teaching and learning for decades (Horwitz et al., 1986; MacIntyre & Gardner, 1994a). Language anxiety is "the feeling of tension and apprehension specifically associated with second language contexts, including speaking, listening, and learning" (MacIntyre & Gardner, 1994a, p. 284). Horwitz et al. (1986) proposed a classification system for language anxiety that contains three distinct types, determined by the contexts in which they arise, namely "communication apprehension, test anxiety, and fear of negative evaluation" (p. 127). Communication apprehension refers to an individual's shyness or fears associated with communicating with others using a foreign language (Horwitz et al., 1986). According to Piniel and Csizér (2014), anxiety in the context of a foreign language classroom is "situation-specific anxiety" or "repeated momentary experiences of anxiety" (p. 166). As this paper focuses on depicting the dynamics of anxiety, the moment-to-moment state of learners' anxiety was examined.

The outbreak of the COVID-19 pandemic had a significant impact on the education sector, with schools and universities shifting to online teaching and learning to maintain educational activities during periods of strict social distancing. Although the COVID-19 pandemic is more or less under control, online learning has not lost popularity and remains an indispensable part of education alongside traditional face-to-face instruction. However, previous studies have reported inconsistent results regarding the levels of anxiety experienced by learners in online versus face-to-face classes. While some studies suggested that learners experience higher levels of anxiety in online classes (Russell, 2020; Wang et al., 2020), others reported the opposite (Côté & Gaffney, 2021). However, there has been a lack of studies on this issue, justifying further investigations to gain deeper insights into the topic.

2 Literature review

2.1 Language anxiety and dynamic systems theory

Dynamic Systems Theory (DST), has appeared as a useful framework for studies in the field of applied linguistics since it was introduced by Larsen-Freeman in 1997 (Verspoor & Lowie, 2021). As de Bot et al. (2013) explained, systems refer to groups of entities or components that collectively form a unified whole. Systems are composed of subsystems, but systems themselves also function as subsystems of larger systems (de Bot et al., 2013). In their 2007 study, de Bot et al. defined four primary properties of a dynamic system, including its change over time, the interconnectedness among its variables, its self-organization into attractor states and speller states, and finally, the butterfly effect, which means that small changes can trigger shifts in the whole system. Anxiety has been shown to possess these properties in previous research studies (MacIntyre & Legatto, 2011; Shirvan & Talebzadeh, 2017).

Few studies exist which have employed DST to explore language anxiety. For instance, Huynh (2021) used a DST approach to examine foreign language learners' anxiety in online classes during social distancing amid the COVID-19 pandemic. She suggested that the dynamics of learner anxiety in online language courses featured multiple nonlinear fluctuations. In addition, she attributed the learners' anxious states to a lack of preparedness for the lessons. However, in their 2014 work, MacIntyre and Serroul argued that anxiety emerges when efforts fail to meet the demands of communication tasks and that an increasing difficulty level in communication tasks can trigger an escalation of learners' anxiety levels. Another study by Gregersen et al. (2014) used an idiodynamic approach to examine the anxiety of six participants while delivering presentations. The authors triangulated various data sources, including responses to the Foreign Language Classroom Anxiety Scale (FLCAS; Horwitz et al., 1986), physiological heart rates recorded during the presentations, idiodynamic self-ratings of learner anxiety using the software developed by MacIntyre and Legatto (2011), and follow-up interviews. Strong associations were found between the results produced by the various data sources. Despite promising findings such as these, DST has been employed in a limited number of anxiety studies. Thus, further investigations using this theoretical perspective are needed to enrich this research area.

2.2 Language anxiety and the idiodynamic approach

The idiodynamic approach was developed by MacIntyre (2012) to examine fluctuations in emotional or perceptive states related to individual communication. The procedure consists of four stages:

- The oral performances of the participants are videotaped for later replay.
- Participants are instructed to use software, namely the Anion Variable Tester v2, to rate their affective or cognitive state at per-second timescales while simultaneously watching the recorded videos.
- Interviews are conducted to elicit participants' explanations of moment-by-moment changes on the graphs produced by the software mentioned above. These interviews are also recorded.
- The entire procedure is transcribed.

Several studies have explored language learning anxiety using the idiodynamic approach. While some studies focused on identifying patterns in participants' anxiety and searching for attributors, others investigated the relationship between anxiety and other factors such as willingness to communicate (MacIntyre & Gregersen, 2022), enjoyment (Boudreau et al., 2018), and familiarity with interlocutors (Shirvan & Talebzadeh, 2017), as well as their dynamic relationships. The findings show consistency regarding several aspects.

Firstly, it is worth noting that all of the reviewed studies have concluded that using the idiodynamic approach allowed for the collection of rich and dense data (i.e., Gregersen et al., 2014; Mardian & Nushi, 2023). Researchers triangulated the quantitative data (including responses from questionnaires designed to measure language anxiety and self-ratings obtained using the Anion Variables Tester software) with the qualitative data consisting of video recordings and post-task interviews. Interestingly, some researchers even incorporated additional data sources, such as heart rate measurements obtained from heart monitors worn by participants during their performance (Gregersen et al., 2014).

Secondly, this approach has enabled researchers to examine per-second changes in anxiety (Mardian & Nushi, 2022) and investigate its dynamic nature (Garcia & Appel, 2018; He et al., 2021). Previous research has shown that individuals' anxiety trajectories are distinctive (Gregersen et al., 2014; He et al., 2021; Shirvan & Talebzadeh, 2017), as they were affected by various factors in different ways and showed varied responses to these impacts. This result is consistent with the assertion by Gregersen et al. (2014) that even the same person speaking on the same topic to the same audience at the same venue can exhibit various trajectories at different times. While this distinctiveness offers valuable insight into language anxiety at the

individual level, it creates difficulties in generalizing research results (Garcia & Appel, 2018).

Finally, based on the thorough review of the limited number of relevant studies on language anxiety using the idiodynamic approach, it can be concluded that various factors attributed to moment-to-moment anxiety fluctuations have fallen into two categories, namely internal and external factors. This classification is consistent with the grouping proposed by He et al. (2021). Other authors, such as Garcia and Appel (2018), have proposed different groupings, grouping factors based on whether they cause spikes or dips in trajectories. However, it can be argued that the two groups above, internal and external factors, are broad enough to encompass the attributors identified by previous researchers. The first group, internal factors, comprises self-efficacy (Garcia & Appel, 2018; He et al., 2021), fear of misinterpretation, and individual curiosity about given topics (Garcia & Appel, 2018). He et al. (2021) also found that gender, fear of being judged, fear of failure, and lack of confidence were internal factors that contributed to changes in language learners' anxiety. The second group, external factors, includes the turn-taking and engagement levels of learners regarding the provided topics (Garcia & Appel, 2018), the difficulty level of the given tasks (Garcia & Appel, 2018; He et al., 2021), non-verbal feedback from partners, the level of familiarity with their partners (Shirvan & Talebzadeh, 2017), types of in-class activities, teacher's feedback, and peer feedback (He et al., 2021).

2.3 The present study

This study aims to investigate the patterns of anxiety that can be observed among secondary school EFL learners during oral performances in online classes and to identify the factors that contribute to changes in the observed anxiety levels. Accordingly, the study seeks answers to the following research questions:

1. What patterns of anxiety can be observed among EFL secondary school learners during oral performances in online classes?
2. What factors do EFL secondary school learners attribute to the changes in their anxiety levels?

3 Method

3.1 Participants

Table 1. Background information

Name	Gender	Age	Grade	Starting grade for learning English	Type of school	School area
Thuy	Female	13	7	1	Public school	Urban
Uyen	Female	13	7	1	Public school	Urban
Nga	Female	13	7	3	Public school	Rural
Hoa	Female	14	8	1	Public school	Urban
Tuyet	Female	13	7	1	Public school	Urban
Vi	Female	13	7	3	Public school	Urban
Trinh	Female	12	6	2	Private school	Urban

Table 1 presents the information on the seven female participants. Pseudonyms were used to maintain confidentiality. All participants had been studying English since Grade 3 as a compulsory subject, with four beginning in Grade 1 and one in Grade 2 as an elective. It is worth noting that all participants had been participating in online classes for nearly two years since the first wave of the COVID-19 pandemic in Vietnam.

3.2 Material and procedure

Firstly, consent forms were sent to the parents to ensure their consent to the children’s participation. The first part comprised 30 items adapted from the previously mentioned FLCAS (Horwitz et al., 1986) that were modified to suit the specific research topic. The second part of the questionnaire comprised six questions collecting biographical information from the participants.

Several modifications were made to the original version of the FLCAS. The word *online* was added to the phrase *language class* from the original version (i.e., *I tremble when I know that I'm going to be called on in online language class* instead of *I tremble when I know that I'm going to be called on in language class*), which accurately described the research context of the study. Moreover, three original items (i.e., Item 5, 17, and 22) were adjusted to ensure all items were loaded in the same direction. More specifically, negative statements were converted into affirmative ones and vice versa. For instance, the item *I don't feel pressure to prepare very well for language class* was replaced with *I feel pressure to prepare very well for online language class*. In addition, three original items (i.e., Item 6, 14, and 32) were excluded from the survey instrument as they pertained to anxiety experienced outside of the language classroom, which was not the primary focus of this study.

The participants were informed of the scheduled day of data collection in advance. On the day of the data collection, students participated in an online class via Skype and received a brief description of the study, followed by instructions on how to respond to the online questionnaire within 15 minutes. At the next stage, each participant provided oral responses to five questions on a topic, and their oral performance was video-recorded. The length was between 1 min and 40 s and 5 min and 12 s.

The students were informed about an upcoming offline meeting two days later to rate their anxiety levels. The participants were given instructions on operating the software. They were then asked to rate their anxiety levels while viewing their videos by clicking on either the *increase anxiety* button, which ranged from 0 to +5, or the *decrease anxiety* button, which ranged from 0 to -5. Participants performed this task twice: the first served as a practice trial, and the second provided data to be analyzed.

One-to-one online interviews were conducted shortly after the data collection phase. The participants were presented with the line graphs of their anxiety levels and their recorded videos simultaneously. The researcher paused the videos when significant changes in anxiety were observed and asked learners for their explanations. The interviews were also video-recorded, and the interviewees were asked questions as follows:

- (1) What were the reasons behind the high anxiety rating at this particular moment?
- (2) Can you elaborate on the reasons for your low anxiety level at this moment?
- (3) What are the reasons for the consistent level of anxiety during this interval?
- (5) Would you like to share anything related to your oral performance?

4 Results

The results section presents the findings for each participant regarding the two research questions. The mean values of two data sets are provided for each participant, including situation-specific anxiety data obtained through the FLCAS and state anxiety (or dynamic anxiety) data gathered using the software. Situation-specific anxiety refers to a participant's tendency to experience anxiety in the context of online language classes. On the other hand, state anxiety denotes the temporary emotional state that arose during their speaking tasks. Min-max normalization (Han et al., 2011) was utilized to rescale the two data sets, with each variable scaled between 0 and 1 to avoid the scaling problem.

Table 2. Speaking time and mean values of learners’ situation-specific and state anxiety

Participants	Speaking time (seconds)	Mean values of situation-specific anxiety		Mean values of dynamic anxiety		Differences in mean values between situation-specific and state anxiety
		Before rescaling	After rescaling	Before rescaling	After rescaling	
Thuy	188	3.6	0.65	-0.26	0.47	0.18
Uyen	182	3.47	0.62	0.17	0.52	0.10
Nga	100	2.97	0.49	0.33	0.53	0.04
Hoa	196	4.33	0.83	0.00	0.50	0.33
Tuyet	127	3.43	0.61	-0.07	0.49	0.11
Vi	254	2.73	0.43	-0.1	0.49	0.06
Trinh	312	3.53	0.63	0.14	0.51	0.12

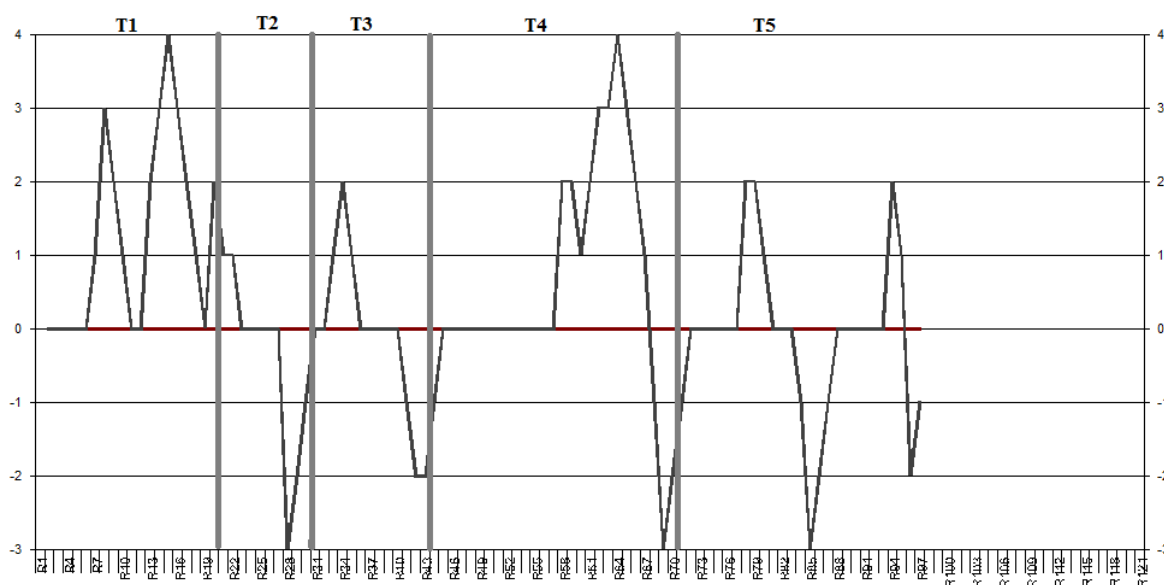
Table 2 reveals both consistency and variation between the participants’ situation-specific and state anxiety. Specifically, two out of the seven participants, namely Nga and Vi, exhibited minimal differences between their situation-specific and state anxiety levels, which were 0.04 and 0.06, respectively, suggesting consistency between these two participants. For instance, both mean values consistently showed that Vi tended to experience low levels of anxiety in online language classes in general and during the observed online session in particular (see Table 2). In contrast, the data obtained from Thuy, Uyen, Hoa, Tuyet, and Trinh exhibited discrepancies between their situation-specific and state anxiety levels. For instance, Hoa displayed the most remarkable difference in mean values of the two scales with a difference of 0.33. Her FLCAS mean value suggested that she typically experienced high levels of anxiety in online language classes. In contrast, her state anxiety mean value indicated a balance between anxious and anxiety-free experiences during her speaking performance (see Table 2).

The next section provides a vertical analysis of the idiodynamic data for each participant. It is worth noting that the participants’ anxiety is described in ascending order of the fluctuations in their anxiety, which was derived from the sum of clicks on both the *increase anxiety* and *decrease anxiety* buttons. As a result, the participants are listed in the following order: Nga (47 clicks), Uyen (55 clicks), Tuyet (71 clicks), Thuy (90 clicks), Trinh (116 clicks), Vi (124 clicks), and Hoa (167 clicks). Notably, the quantitative data gained through the FLCAS was merely utilized to provide background information on the participants’ situation-specific anxiety.

Nga

Nga's FLCAS results did not show a tendency to experience anxiety in online language classes. However, she showed a high level of anxiety during the first task, talking about her favorite foods. She admitted that the task was not challenging, but her lack of attention and concentration resulted in feelings of anxiety. Therefore, her response was short and provided relatively little information. She expressed regret over her first response, adding that she could have performed more successfully if she had been in a better mood.

Figure 1. Nga's anxiety pattern



Her anxiety patterns across three subsequent tasks, namely discussing foods she dislikes (as illustrated as T2 in Figure 1), whether she prefers eating at home or at restaurants (as illustrated as T3 in Figure 1), and the advantages of eating at home (as illustrated as T4 in Figure 1) were fairly similar. Her anxiety levels increased at the outset and gradually declined toward the end of each segment. She explained that she tended to feel anxious right after receiving a question and progressively felt more at ease when she was close to completing the task. Additionally, she reported feeling more anxious when asked the fourth question about the advantages of eating at home compared to the second and third tasks, as she had not encountered this question before.

For the final task regarding the disadvantages of eating at home, Nga reported a more relaxed experience, which she attributed to the emergence of numerous available ideas. It is worth noting that the fourth and fifth questions were closely

related. Therefore, she could draw on the ideas for the fifth question based on those produced for the previous question.

Table 3 reveals that the proportion of peaks to troughs was 8:5. The duration of anxious feelings was nearly twice that of relaxed states, consistent with the number of clicks on the *increase anxiety* and *decrease anxiety* buttons, which were 30 and 17, respectively.

Table 3. Nga’s dynamic anxiety ratings

	Ratio of peaks and troughs	Time duration above 0	Time duration below 0	The number of clicks on <i>increase anxiety</i> button	The number of clicks on <i>decrease anxiety</i> button
Nga	8:5	31	17	30	17

Uyen

Initially, during Task 1, Uyen showed minor fluctuations in her anxiety levels when asked to talk about her subjects at school (see Figure 2). Her anxiety considerably decreased during her response to Task 2 about her favorite subject (see Figure 2). Uyen attributed this reduction in anxiety to her belief that her response to Task 1 was good, which boosted her self-confidence and willingness to respond to subsequent tasks.

During Task 3, which required Uyen to describe her school, the graph shows that Uyen experienced the most intense feelings of anxiety, with the peaks occurring three times (see Figure 2). She explained that her limited knowledge of the school and difficulty finding appropriate words to convey ideas resulted in word repetition and pauses in her speech.

In contrast, Uyen did not experience significant anxiety while addressing Task 4, which asked about her favorite subject. Finally, in response to the last question about her future job, Uyen displayed the most relaxed experience (see Figure 2). In explaining this result, she noted that her mother has always expected her to become an English teacher and talked to her about it almost every day. As a result, this career choice was deeply ingrained in Uyen’s mind, and she answered the question promptly without much consideration.

Figure 2. Uyen’s anxiety pattern

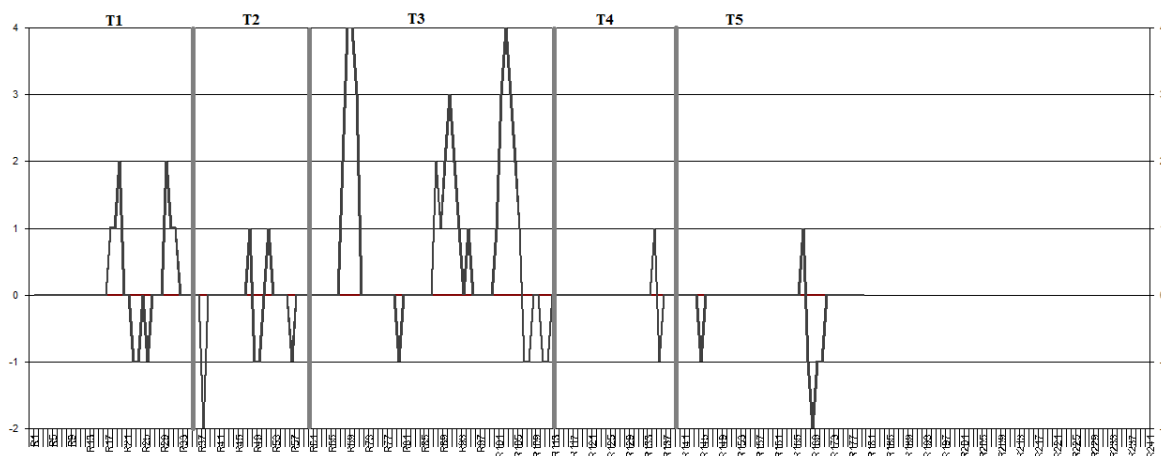


Table 4 indicates that despite a ratio of peaks and troughs of 11:11, the duration of her anxious states was considerably longer than that of her relaxed states. Additionally, the number of clicks on the *increase anxiety* button (33) and the *decrease anxiety* button (22) echoes this difference. Her FLCAS mean value, which was 3.47, also reflected her tendency to experience anxiety in online language classes.

Table 4. Uyen’s dynamic anxiety ratings

	Ratio of peaks and troughs	Time duration above 0	Time duration below 0	The number of clicks on <i>increase anxiety</i> button	The number of clicks on <i>decrease anxiety</i> button
Uyen	11:11	27	18	33	22

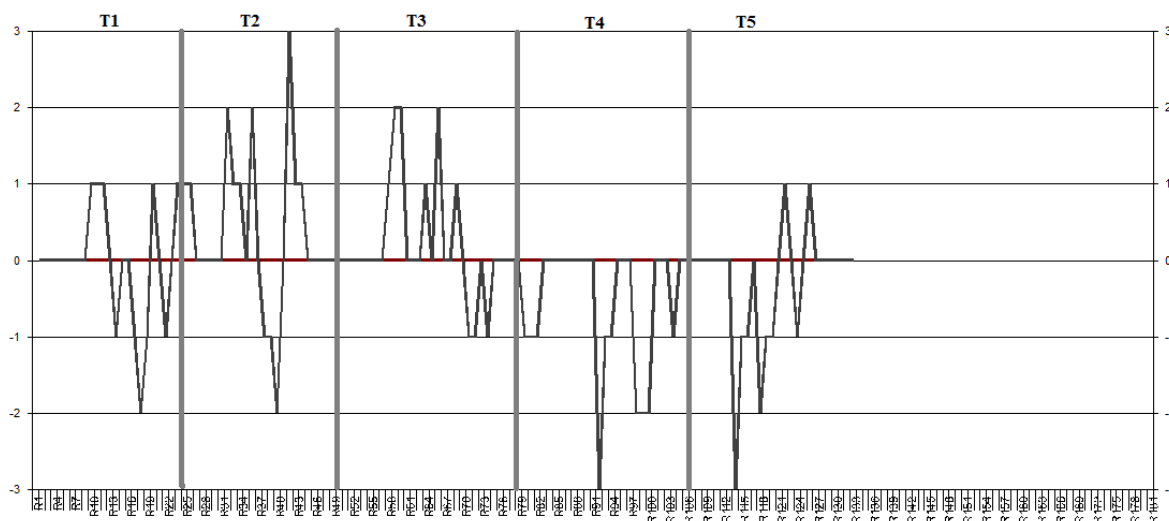
Tuyet

Compared to the two previous participants, Tuyet’s anxiety pattern exhibited more fluctuations in each segment. Notably, her anxiety fluctuated the most during the second segment, in which she was asked about her favorite tourist attractions. It experienced a steep fall to -2 before a sudden jump up to +3 (see Figure 3). In her post-task interview, she explained that her changes in anxiety levels were due to the overwhelming number of places coming to mind and the difficulty of organizing them logically.

Similarly, the third segment of the graph, requiring her to talk about whether she preferred travelling with family or with friends, displays an increase in anxiety to 2 (see Figure 3). She revealed her lack of ideas on the topic, explaining that “I preferred to travel with my friends, but I don’t know why” and “At that time, I just had very

few ideas, and I was afraid I couldn't provide a good answer." This contributed to the increase in anxiety seen during her response to this question.

Figure 3. Tuyet's anxiety pattern



Her trajectory's two lowest points (-3) appeared during her response to Tasks 4 and 5. For Task 4, Tuyet discussed her travelling activities and indicated that "the ideas were available in my mind, and I just verbalized them. Therefore, I didn't feel worried at all". Regarding Task 5 about how often she traveled, Tuyet stated that the question was not difficult and that the ideas quickly came to her mind. Despite the anxiety she reported in the interview, her responses were generally fluent and provided adequate information.

Table 5. Tuyet's dynamic anxiety ratings

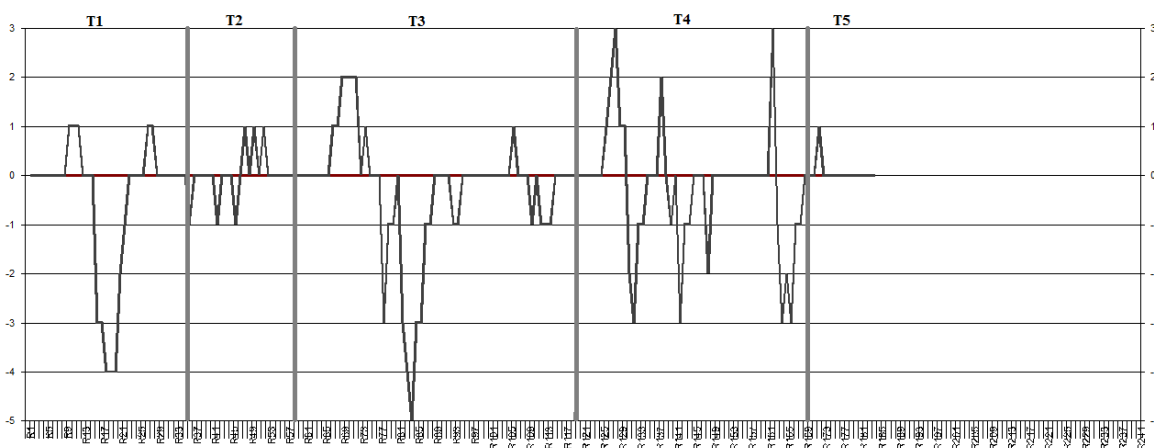
	Ratio of peaks and troughs	Time duration above 0	Time duration below 0	The number of clicks on <i>increase anxiety</i> button	The number of clicks on <i>decrease anxiety</i> button
Tuyet	12:13	22	28	31	40

Table 5 shows that the ratio of peaks and troughs was 12:13, indicating a marginal difference. The duration of her anxious states was 6 seconds greater than that of her relaxed ones. Additionally, the number of clicks on the *increase anxiety* and *decrease anxiety* buttons were 31 and 40, respectively. The consistency in the quantitative data demonstrates that Tuyet experienced more relaxation than anxiety during her performance. However, the mean value of her FLCAS score (3.43) indicates that she typically experienced anxiety during online language classes.

Thuy

Figure 4 shows that Thuy experienced a high degree of relaxation (-4) during her response to Task 1, which asked *When do you have free time?*. Thuy explained that this task was straightforward and did not require much thought, allowing her to respond promptly. Task 2, which asked about her leisure activities, produced minor fluctuations in her anxiety levels.

Figure 4. Thuy’s anxiety pattern



During oral task 3, where Thuy was asked to discuss popular leisure activities in her city, her anxiety reached its lowest point (-5; see Figure 4). Although initially a bit concerned, her fearfulness disappeared after a few seconds as several ideas came to mind. In the subsequent question asking whether she preferred to spend free time with friends or family, Thuy's anxiety level fluctuated the most. At first, she was unsure about her preference, leading to an increase in her anxiety level to +3. After deciding to choose friends, her anxiety level decreased, but it surged again when she struggled to explain the reasons for her choice.

Table 6. Thuy’s dynamic anxiety ratings

	Ratio of peaks and troughs	Time duration above 0	Time duration below 0	The number of clicks on <i>increase anxiety</i> button	The number of clicks on <i>decrease anxiety</i> button
Thuy	12:15	24	41	38	52

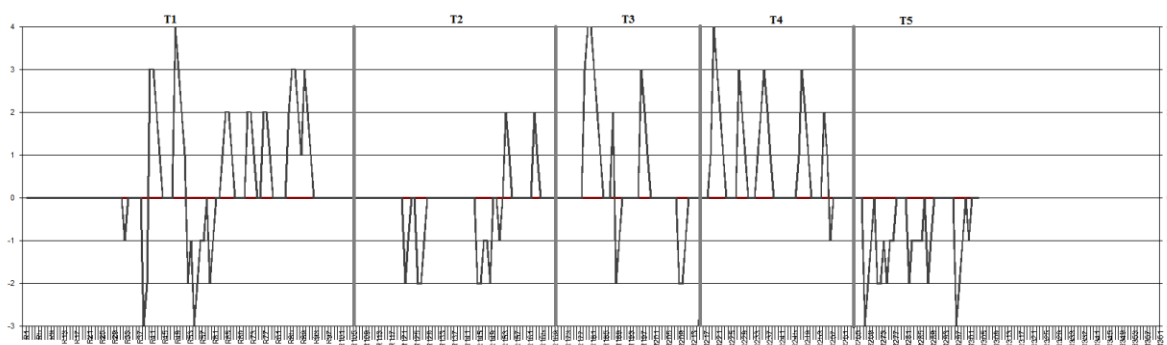
When responding to the next question on the importance of free time, Thuy's anxiety levels dropped to 0 and remained unchanged until the end of her performance. She explained that she began to feel a sense of relief since she knew that this answer would bring her to the end of her performance.

Table 6 reveals that Thuy’s anxiety dynamics showed fewer peaks than troughs, with a ratio of 12:15. The duration of her anxiety-free states was nearly twice as long as that of her anxious states. Accordingly, the number of clicks on the *decrease anxiety* button significantly outnumbered those on the *increase anxiety* button. This result suggests that Thuy felt relatively relaxed throughout her performance despite the mean value of her FLCAS score (3.6), indicating that she often feels anxious during online language classes.

Trinh

The first task required Trinh to introduce her city. She remained silent for several seconds before answering the question and showed many instances of hesitation. Figure 5 indicates that her anxiety level reached +4, which she explained by stating that “I don’t completely understand the question” and “I don’t know much about my city.”

Figure 5. Trinh’s anxiety pattern



Her ideas for the second question regarding tourist attractions in Trinh’s city were disorganized, and her response contained multiple grammar mistakes. She switched between ideas and ended her answer abruptly. Her anxiety level in the second segment was low in the beginning but increased towards the end. In the subsequent question about her favorite thing in her city, her anxiety jumped to +4 again. She remained silent for seven seconds before deciding on coffee as her favorite. When asked to clarify her high level of anxiety, she said, “There are a lot of things I like about my city, but I must consider the one I like best to share” and “I find it hard to find suitable words to convey my idea.”

The next task asked her to share what she disliked about her city. Although she responded quickly, she did not provide a complete explanation. This task produced a lasting anxious state for Trinh, as she had never considered the topic before. The final answer seemed to be the most fluent, and Figure 5 also indicates a low degree

of anxiety for this task. She attributed her relief to the availability of ideas regarding recent changes in her city.

Table 7. Trinh’s quantitative data

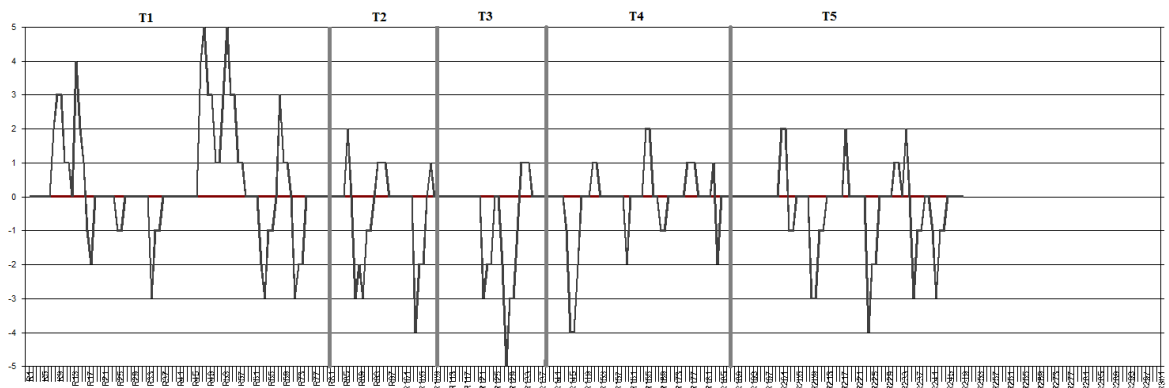
	Ratio of peaks and troughs	Time duration above 0	Time duration below 0	The number of clicks on <i>increase anxiety</i> button	The number of clicks on <i>decrease anxiety</i> button
Trinh	17:20	59	48	64	52

Interestingly, Table 7 shows that the proportion of peaks to troughs was 17:20; However, the duration of time she experienced anxiety (59 seconds) was longer than the duration of her relaxed states (48 seconds), and the number of clicks on the *increase anxiety* button (64) was more significant than those on the *decrease anxiety* button (52). Apart from the ratio of peaks and troughs, the rest of the data in Table 7 was consistent with the mean value of her FLCAS score (3.53).

Vi

Among the seven participants, Vi had the lowest mean FLCAS score (2.73), indicating that she typically does not experience anxiety in online language classes. However, during her first response about festivals in Vietnam, she exhibited numerous pauses and hesitations and could only list a few festivals in her area. Figure 6 indicates that the maximum level of +5 was reached twice. In her interview, she explained her anxiety with statements including “I don’t know many festivals in Vietnam,” “I only know two festivals in my province,” “It would be easier if I was asked about the most important festival in my province instead of the one in Vietnam,” and “I was very nervous, as I didn’t think I could answer this question.”

Figure 6. Vi’s anxiety pattern



For the second task relating to how people celebrate festivals in Vietnam, Vi remained silent for eight seconds, with her face turning pale. However, she reported very low levels of anxiety, specifically -3 and -4 (see Figure 6). To explain, she stated that she came up with ideas for her answer during the pause, which provided a feeling of satisfaction.

In the subsequent question about her favorite festival activity, she reported the lowest level of anxiety (-5; see Figure 6). Vi explained her anxiety-free state during this task, stating that “I was confident with my answer” and “I didn’t spend much time thinking about the answer.”

During the next task, which asked about the importance of festivals, Vi responded fluently without showing any signs of anxiety, which is consistent with what was reported in the graph. As for the final question about whether she likes to attend festivals with family or friends, she responded quickly and confidently.

Table 8 reports 17 peaks and 19 troughs in Vi’s anxiety curve. The time duration below the 0 level is greater than that above 0, with 45 seconds and 54 seconds, respectively. Vi clicked 57 times on the *increase anxiety* button and 67 times on the *decrease anxiety* button. Overall, Vi experienced more states of relaxation than anxiety, which is consistent with her FLCAS mean score.

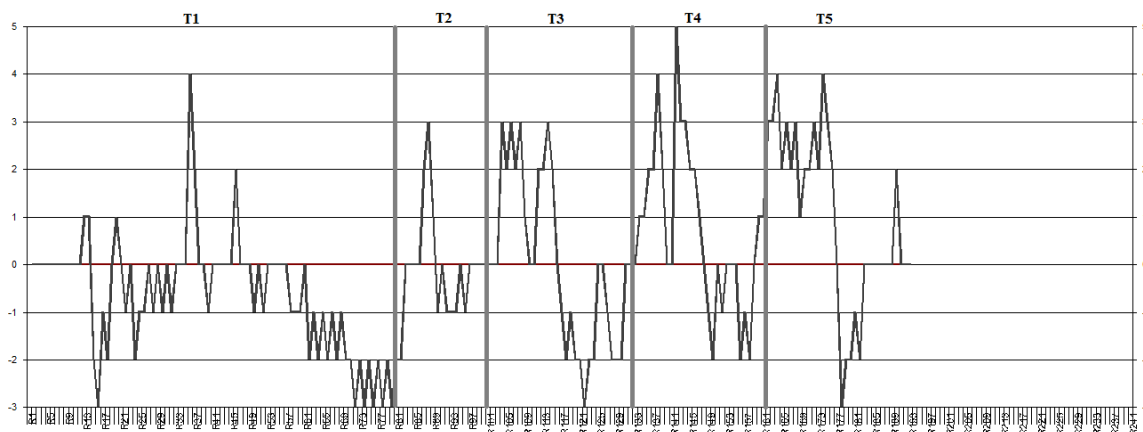
Table 8. Vi’s dynamic anxiety ratings

	Ratio of peaks and troughs	Time duration above 0	Time duration below 0	The number of clicks on <i>increase anxiety</i> button	The number of clicks on <i>decrease anxiety</i> button
Vi	17:19	45	54	57	67

Hoa

In response to the first question asking whether she had close friends, Hoa responded fluently without expressing any anxious feelings, although there was a short pause towards the end of her response. Her anxiety pattern indicated that she mostly felt relaxed; however, at one point, she reported her anxiety to be at +4, which was explained with statements such as "I always feel nervous when being asked" and "I don't have many friends, so I didn't know what to say." Figure 7 shows that Hoa rated her anxiety at -3 twice. She attributed the first time to the low difficulty level of the question and the second time to her knowing precisely who to talk about in her response.

Figure 7. Hoa's anxiety pattern



For Task 2, which asked about her activities with friends, Hoa responded, “I often hang out with my close friends on weekends and chat with them at school and at home.” As seen in Figure 7, Hoa’s anxiety went up to level +3 from the beginning of her response. She explained her anxiety, expressing that “all I do with my friends is texting them sometimes to discuss the lesson or ask about homework, so my answer was not completely true.”

Regarding the third question on whether she preferred spending time with family or friends, Hoa hesitated several times. Figure 7 displays an increase in her anxiety at the beginning and a decrease at the end. The highest level of anxiety occurred during the fourth task when Hoa discussed the importance of friendship. Explanations were provided to clarify the reasons behind this high point such as “I don’t know what to say” and “My mind went blank at that moment”. In the final question about whether she shares her difficulties with her family or friends, her anxiety increased to level +4. She reported that it was difficult to choose an answer and explained that her choice ultimately depended on the situation. Later, her anxiety showed a sharp decline to -3 when she was close to completing her answer. Similar anxiety patterns can be seen in Hoa’s responses to Tasks 3, 4, and 5, with a rise at the beginning and a drop at the end. Hoa provided similar explanations for these patterns, attributing the rises in anxiety to a lack of ideas and the decreases due to their emergence.

Despite a mean FLCAS score of 4.3, Hoa experienced more relaxation than anxiety during her oral performance (see Table 9). The ratio of peaks to troughs in her anxiety trajectory was 17:32, indicating a greater frequency of relaxed states. Moreover, the duration of her relaxed states was notably more prolonged than that of her anxious states, lasting 66s and 49s, respectively. Table 9 showed that she clicked the *decrease anxiety* button 100 times compared to 67 clicks on the *increase anxiety* button.

Table 9. Hoa’s dynamic anxiety ratings

	Ratio of peaks and troughs	Time duration above 0	Time duration below 0	The number of clicks on <i>increase anxiety</i> button	The number of clicks on <i>decrease anxiety</i> button
Hoa	17:32	49	66	67	100

5 Discussion

5.1 Learners’ anxiety patterns during oral performance in online EFL classes

Firstly, it is evident that participants' anxiety trajectories during their oral performances in online EFL classes are distinctive and unique, which supports previous findings by Shirvan and Talebzadeh (2017), Gregersen et al. (2014), and He et al. (2021). The participants exhibited varying degrees of fluctuations.

Similarities and differences were discovered at both the inter-participant and intra-participant levels when taking into account the anxiety trajectories observed during each task. Two out of the seven participants (i.e., Nga and Hoa) experienced similar anxiety patterns, with a rise in anxiety at the beginning of the task and a decrease in anxiety at the end. This result was attributed to uncertainty about responding to the given questions, followed by relaxation when the task was almost complete. Regarding their overall anxiety trajectories, Thuy and Hoa showed a decline in their anxiety level as they approached the completion of their sessions. Apart from these convergences at the inter-participant level, the remaining participants displayed divergent anxiety patterns. At the intra-participant level, the anxiety trajectories observed during the responses to various questions were consistent (i.e., Nga and Hoa). For example, Hoa exhibited similar anxiety patterns during her responses to the third, fourth, and fifth questions.

5.2 Factors affecting learners’ anxiety during oral performance in online EFL classes

This study's findings suggest that two categories, internal and external factors, contributed to the changes in participants' language anxiety. Internal factors include self-confidence, familiarity with the topic, the emergence of relevant ideas, language proficiency, satisfaction, dishonesty in responses, and internal readiness, while external factors consist of task complexity and external readiness.

Firstly, self-confidence was found to affect participants’ anxiety levels. For instance, Uyen believed that her first response was satisfactory, which boosted her self-confidence for the subsequent questions. Similarly, Vi's anxiety level dropped due to her confidence in her answer to a particular question. This finding is consistent with previous studies by Garcia and Appel (2018) and He et al. (2021), which highlight the role of self-efficacy in influencing learners' anxiety.

The second factor that influenced participants' anxiety was their familiarity with the topic at hand. Four out of seven participants (i.e., Nga, Uyen, Trinh, Vi) reported that the topic was unfamiliar to them, which increased their anxiety. Task complexity was also found to affect participants' anxiety levels. Tuyet, Thuy, and Hoa reported feeling more relaxed as the questions were straightforward. This finding is reinforced by Huynh (2021), Garcia and Appel (2018), and He et al. (2021), who emphasized the impact of task complexity on learners' anxiety.

Notably, the emergence of numerous relevant ideas also increased anxiety, as learners found it challenging to organize their ideas logically or decide which ones to retain and which to leave out. Tuyet and Trinh mentioned this factor in their interviews.

Furthermore, the language proficiency of the learners was found to cause fluctuations in their anxiety levels. For instance, Uyen explained that her lack of relevant vocabulary made it difficult to express her ideas. Additionally, learners' language proficiency can affect their comprehension of the questions, as in the case of Trinh, who attributed her increase in anxiety to not fully understanding the question.

Participants' satisfaction with their responses noticeably contributed to the anxiety reduction (i.e., Vi). Conversely, dishonesty in responses was shown to lead to an increase in anxiety. For instance, Hoa did not participate in many activities with her friends, but she was afraid of her responses being short and insufficient. Consequently, she added some activities she did not actually do with her friends. This dishonesty resulted in her anxiety surge.

The last factor that emerged in this study was readiness, which refers to a state of preparedness among those involved in the online classroom setting (Huynh, 2021). Two categories of readiness were identified: internal readiness, which is related to the learners themselves, and external readiness, which is linked to the learning environment. For internal readiness, the participants reported a lack of concentration on the tasks and uncertainty about what to say. For example, Nga explained that she was not fully focused, resulting in a delay in her response and an increase in anxiety during the first task. Regarding uncertainty about what to say, Thuy, Trinh, and Hoa admitted that despite having several ideas in mind, they found it challenging to decide what to say. External readiness factors, such as the quality of the Internet connection or the availability of electricity, also affect learners' anxiety levels. Tuyet got nervous, as the Internet connection at her home was unstable, and she could not hear the teacher's questions clearly. This finding is also in line with Huynh's (2021) study. Although these issues did not occur during the observed class, they were mentioned by Tuyet when explaining what contributed to her increased anxiety.

6 Conclusion

The findings revealed both convergences and divergences at intra- and inter-participant levels, with increases and decreases in anxiety observed over per-second timescales. The anxiety trajectories of the participants reported in connection with their speaking tasks were unique, non-linear, and unpredictable. The factors triggering changes in participants' anxiety levels included self-confidence, task complexity, the emergence of an overwhelming amount of relevant ideas, language proficiency, performance satisfaction, dishonest responses, and readiness, which all contributed to changes in the participants' oral anxiety.

The present study provides valuable insights for teachers, which can help them better understand their students' anxiety at an individual level and the factors contributing to fluctuations in their anxiety during oral performances in online classes. The findings suggest that teachers can adjust the level of task complexity, implement strategies to enhance students' self-confidence, provide students with techniques to handle an overabundance of ideas and strengthen their language knowledge across various topics.

In addition, this research confirms that learners' anxiety constitutes a dynamic system, as it reflects the four properties laid out by de Bot et al. (2007). This finding has been reported in several previous studies in this field (MacIntyre & Legato, 2011; Shirvan & Talebzadeh, 2017). More specifically, the line graphs show that participants' anxiety during their performances changed over time, rather than being linear and stable. Furthermore, there is an interconnectedness among variables; for instance, participants' familiarity with the topic was closely related to their oral performance. Nga, Uyen, Trinh, and Vi were not entirely familiar with the topics and knew relatively little about them, which considerably influenced their oral performance. Thirdly, participants' anxiety was observed to self-organize by moving between attractor states and repeller states. For instance, Hoa's anxiety increased (representing a repeller state) at the beginning of her tasks and went down (representing an attractor state) at the end of each response for three successive tasks. The last property pertains to how small changes can trigger shifts in the whole system (i.e., the butterfly effect). Taking Uyen as an example, the emergence of relevant ideas led to a relaxed state throughout the response to the last question.

However, the study is not without its limitations. Regarding the software used, when participants do not click to indicate their anxiety level, the rating automatically reaches 0 (MacIntyre & Gregersen, 2022). Although a more recent version developed by Ducker (2020) can overcome this shortcoming, the researcher only had access to the original version of the software (MacIntyre, 2012) at the time of data collection. Secondly, Tuyet complained in her post-task interview that she did not have enough time to rate her anxiety to the highest (+5) or lowest level (-5), as clicking to change

the level took time. By the time she finished clicking, her anxiety had already changed to another state with a different level, causing potential inaccuracies in her ratings. This newly-found drawback should be considered when employing the idiodynamic approach for future studies.

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