rEFLections
Vol 32, No 3, September - December 2025

Assessing Learner Engagement beyond the Classroom with Snapshots

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Article information
Article history:
Received: 4 Oct 2024
Accepted: 23 Dec 2025
Available online: 25 Dec 2025

Keywords:
Learner engagement
Snapshots
Out-of-class learning
Autonomous learning
Memory recall

Abstract

Over the past 20 years, research on engagement in learning and its potential impact on language learning has gained significant attention. Various methodological approaches exist, including student self-reports, observations, experience sampling, and interviews, each with its own strengths and limitations. The feasibility of each approach varies depending on the type of engagement data to be collected (e.g., descriptive or inferential). Student self-reporting is a common method for collecting descriptive and detailed engagement data based on learners' perceptions. However, this approach often relies on records like learning activity logs, which can lead to vague memories and superficial records. To address this issue, the present study investigates the potential of using smartphone snapshots taken by learners to capture specific instances of their out-of-classroom learning. Snapshots offer a more immediate and context-rich way to capture learning experiences as they occur, helping to overcome limitations of memory-dependent self-reports. Seven university students from a private university in Japan participated in photographing their out-of-class learning activities over a six-month period. After taking the snapshots, they reflected on their out-of-class learning through semi-structured interviews once every two months. Combining multiple methods may be desirable to complement the shortcomings of individual approaches. The photos were visually analyzed, and the interview data underwent thematic analysis. The findings revealed that snapshots are an effective means of recording specific learning experiences and enhance memory recall in a context-rich and detailed manner. Furthermore, by combining snapshots with semi-structured interviews, learners were able to deepen their understanding of multi-dimensional autonomous learner engagement beyond the classroom.

INTRODUCTION

Engagement is composed of dynamic dimensions and is always accompanied by action (Hiver et al., 2021). In the classroom, interpersonal relations and instructional quality facilitate

This paper was specially selected to be published from the 5th Doing Research in Applied Linguistics (DRAL 5) International Conference that was run from 5 to 7 September 2024 in Bangkok, Thailand.

engagement (Oga-Baldwin, 2019). Although the importance of engagement in classroom learning is widely recognized, unfortunately, little research has been conducted on effective interventions to promote self-directed learning outside the classroom, which is essential for language acquisition. This is partly due to the difficulty of grasping and understanding the multiple aspects of engagement. Furthermore, it is difficult for researchers to access out-of-class learning, making it challenging to collect data on engagement. Hiver et al. (2021) conducted a systematic review of 20 years of research methods and definitions related to engagement in language learning. They examined a total of 112 studies and discovered that only five of these studies focused on "out-of-class language use" or "out-of-class learning." Despite the growing emphasis on learner autonomy in language learning, there has been little research on how learners engage in self-regulation outside of formal instruction. This is particularly true in EFL contexts such as Japan, where tools for such efforts remain limited. This study aims to understand the types of English language learning activities that Japanese EFL learners engage in outside of the classroom. Participants will record their learning activities on their smartphones as snapshots and then participate in interviews to gain insight into their specific learning experiences, focusing on their level of engagement. The snapshots are intended to stimulate recall during the interviews, allowing for a better assessment of learner engagement with autonomous learning beyond the classroom.

Research question: How do snapshots, when used alongside interviews, facilitate memory recall and provide insights into the behavioral, cognitive, affective, and social dimensions of learner engagement beyond the classroom?

LITERATURE REVIEW

Learner engagement

Engagement is defined as "a state of heightened attention and involvement" (Philp & Duchesne, 2016, p. 51). In the language learning environment, learners are engaged if they actively participate in learning by focusing on the tasks and experiencing positive emotions (Hiver et al., 2020). Thus, the key feature of engagement is action, which is essential to all learning, therefore learning only occurs when engagement is present.

Engagement consists of multiple dynamic dimensions, and no clear agreement has been reached on the number of engagement dimensions. It is generally accepted that engagement consists of three to four constructs among behavioral, cognitive, affective, social, and agentic constructs. While the number of constructs may be the same, their combinations and definitions may differ. Svalberg (2009) describes cognitive engagement focusing on reflection and problem solving, affective engagement for the maintenance or enhancement of feelings of involvement with the language and its interlocutors, and social engagement for the initiation and maintenance of interaction. On the other hand, Hiver et al. (2020) define three types of engagement: behavioral engagement, which represents the qualitative behavioral choices of individuals in learning; affective engagement, which includes learners' emotional connections and responses to learning tasks and peers; and cognitive engagement, which is related to

learners' mental activities in the learning process. Furthermore, Reeve (2012) states the fourth construct; agentic engagement, as an active, intentional, and constructive contribution to the flow of learning activities. Not only is each construct of engagement vital for learning, Philp and Duchesne (2016) suggest that multiple dimensions of engagement are overlapping, interdependent and influencing each other, calling for a carefully articulated definition of engagement because of its complexity.

This study investigates four engagement constructs: behavioral, cognitive, affective, and social. Behavioral engagement is assessed through indicators such as voluntary participation, proactive interactions, time spent on tasks, and persistence. Cognitive engagement involves individuals being fully alert, paying focused attention, and actively constructing their knowledge. Affective engagement refers to a state where individuals feel positive, purposeful, willing, and autonomous. This sense of autonomy in learning enables individuals to take charge of their learning journey, allowing them to explore and understand at their own pace. Social engagement is characterized by interaction and initiative. Table 1 presents how this study operationalizes the four types of engagement within the context of language learning. The characteristics of each engagement construct were referenced during the thematic analysis of the interview data.

Table 1

Constructs of engagement

Behavioral	Cognitive	Affective	Social
- Time on task or participation	- Alertness	- Positive attitude	- Interaction
- Effort	- Focused attention	- Purposeful	- Agency
- Persistence	- Action knowledge	- Willingness/choice	- Long term
- Active involvement		- Autonomy	- Other-oriented
			- Self-oriented

Adapted from Philp & Duchesne, 2016, p. 60 and from Svalberg, 2009, pp. 246-247.

Learning beyond the classroom (LBC)

Having established how engagement functions within language learning, this section explores how such engagement unfolds outside formal settings—an area known as learning beyond the classroom (LBC).

LBC is defined as "a field of inquiry, therefore, is to say that it is centrally concerned with locations for language learning other than the classroom and with relationships between these locations and aspects of formality, pedagogy and locus of control" (Benson & Reinders, 2011, pp. 12-13). The four dimensions, location, formality, pedagogy and locus of control, are outlined in Table 2. As the table shows, the four dimensions interconnect to form a unique tapestry of potential learning configurations, each benefiting from its own form of observation and, where applicable, measurement (Reinders, 2020).

Table 2

Four dimensions of learning beyond the classroom

Dimension	Description	Terms
Location	When and where learning takes place	Out-of-class, after-class, extracurricular, self-access, out-of school, distance
Formality	The degree to which learning is linked to educational qualifications or structured by educational institutions	Informal, non-formal, naturalistic
Pedagogy	The degree to which teaching is involved	Non-instructed, self-instructed
Locus of control	How decisions are distributed between the learner and others	Autonomous, independent, self-regulated

Adapted from Reinders & Benson, 2017, p. 562.

Language ability develops not only through cognitive processes, but also in various contexts, such as interactions within the community (Benson & Reinders, 2011). LBC may be beneficial for its availability of choices to enhance engagement. For instance, affective engagement has been shown to increase when task design allows learners more control or choice over task types and discussion topics or when they are allowed to share ideas. Phung et al. (2020) emphasized the importance of considering both learner behavior, such as interaction, and emotional responses, such as enjoyment and anxiety, in order to improve learner engagement, and conducted a study on emotional engagement. This study found that giving learners opportunities to make choices had a positive effect on their emotional engagement and made them feel that they could share their thoughts, opinions, and impressions.

According to a study on learner-generated content and engagement, learners demonstrate higher levels of affective engagement with learner-generated content than with teacher-generated content (Lambert et al., 2017). Linnenbrink-Garcia et al. (2011) examined the relationship between elementary students' affect during small group instruction and their social-behavioral engagement during group work. The study found a reciprocal and cyclical relationship between affect and social-behavioral engagement in small group settings. Baralt et al. (2016) focused on affective and social engagement and revealed that higher levels of affective and social engagement, mediated by both task complexity and the interaction environment, led to increased cognitive engagement among learners. In other words, learner-generated content, which is readily accessible beyond the classroom, is expected to significantly impact engagement levels.

While in-class learning is predominantly teacher-directed and test-oriented, LBC allows learners to proactively select learning materials and activities that are contextually appropriate for developing language skills through practice opportunities such as part-time jobs, social activities and hobbies (Nguyen & Stracke, 2021). Table 3 shows teacher-directed and learner-directed learning processes. In classroom settings, teacher instructions are central throughout all learning stages. Although there have been efforts to create more learner-centered classrooms, the presence of teachers inherently limits the exclusion of their influence. In contrast, LBC enables learners to take control of their learning at various stages, allowing them to learn independently without direct teacher influence or instruction.

Table 3

Self-directed learning process

Learning stages	Teacher-directed	Learner-directed
Identifying learning needs	Placement tests, teacher feedback	Learner experiences/difficulties in using the language
Setting goals	Determined by the course, relatively fixed	Contextually determined, relatively flexible
Planning learning	Determined by the teacher, somewhat flexible	Contextually determined, very flexible
Selecting materials	Provided by teacher	Self-selection by learners
Selecting learning strategies	Teacher models and instructions	Self-selection by learners
Practice	Exercises and activities provided by teacher	Implementation (language use) and experimentation
Monitoring progress	Regular classroom feedback and comments on assignments and tasks	Self-monitoring, peer-feedback
Assessment and revision	Tests, curriculum changes	Self-assessment, reflection

Adapted from Benson & Reinders, 2011, p. 178.

Assessing learner engagement

Autonomous learning in informal, non-instructed LBC is crucial for language acquisition. Despite this, there is still a lack of clarity regarding learner engagement in LBC. In this context, this section examines assessment methods to enhance understanding of the complex nature of learner engagement in LBC.

Evaluating the multifaceted nature of learner engagement is inherently complex and challenging, and as a result, there is no established consensus on the definition or effective evaluation methods for learner engagement (Sinatra et al., 2015). Assessment approaches include surveys, questionnaires, observations, expert evaluations, experience sampling, and interviews, each with its own limitations. Table 4 outlines the advantages and disadvantages of each method. The following section explains the rationale for selecting a combination of interviews and snapshots, considering the characteristics of each method.

Table 4

Advantages and disadvantages of learner engagement assessment approaches

Student engagement assessment	Advantages	Disadvantages
Surveys and questionnaires	Suitable for psychometric testing and validation (e.g., item analysis, factor analysis and item response theory); Simple and straightforward administration; Measures can be standardized	Limited to self-report; Lack of real-time data collection; Participant bias and other drawbacks of self-report
Observations and expert ratings	Spans quantitative or qualitative techniques; Results are detailed and descriptive; Able to capture real-time data; Can link contextual factors to student engagement levels; Measures can be standardized	Results in individual or small samples at a time; Time-consuming to assess; Not easily generalizable without large-N; Lacks ability to clearly measure affective and/or cognitive aspects of engagement

Student engagement assessment	Advantages	Disadvantages
Experience sampling	Real-time engagement ratings; Tracks length and intensity of engagement; Observations recorded without interference from an observer; Multiple students' data collected simultaneously; Many data points over time able to trace changes in development	Time-consuming and resource-intensive; Quality of data depends on participation of student respondents; Struggle to include range of items that represent multidimensional nature of constructs in each sampling moment; Not suitable for younger children, student participants items that represent multidimensional nature of constructs in each sampling moment; Not suitable for younger children, student participants
Interviews	Good for collecting cognitive processing data; Identifies contextual and background factors of student engagement; Able to collect in-depth information on student engagement	One interview at a time; Time-consuming to assess; Socially desirable responses; Interviewer training dependent; Difficult to generalize idiosyncratic findings to a population

Adapted from Zhou et al., 2020, p. 80.

The most frequently used methods for assessing engagement are self-report surveys and questionnaires, which can reach a broad audience and effectively assess various aspects of engagement in diverse contexts (Zhou et al., 2020). Fredricks and McColskey (2012) highlighted a concern that the items in these instruments are often broadly phrased rather than specifically targeting particular tasks or situations. Studying general items may not be suitable for understanding how different engagement factors interact with one another.

Zhou et al. (2020) state that observations and expert ratings offer objective data—quantitative, qualitative, or a combination of both—on learner engagement in individual and classroom settings. These methods enable researchers to collect detailed, context-specific information. However, the authors note that such methods have inherent limitations, including the inability to provide a comprehensive view of student engagement and susceptibility to observer or rater biases. Research using learner-generated content and observation of engagement suggests that methods such as interviews, stimulus recall, or video recording of facial expressions may be necessary to investigate social aspects (Lambert et al., 2017). Therefore, observations and expert ratings may not be the most effective approaches for comprehensively understanding implicit factors such as cognitive, affective and social engagement. In addition, while observation and experience sampling allow for real-time measurement, in out-of-class learning, the timing of engagement is unpredictable, making them impractical for evaluating engagement.

Experience sampling allows researchers to explore how individuals experience learning activities and contexts in real time (Zhou et al., 2020). One form of experience sampling, the idiodynamic method, was initially developed to collect authentic, real-time evidence of a learner's intra-personal variability during activities such as a specific language task that lasts just a few minutes or even seconds (Lu, 2022). This approach examines the real-time complex dynamics of engagement states by utilizing video recordings and specialized software to collect self-reported ratings (MacIntyre & Gregersen, 2021). While it allows for the real-time assessment of changes and enables the collection of immediate, systematic data with flexibility

in selecting target variables, it requires a controlled experimental setting and is prone to error variance due to factors such as forgetting or reluctance to click the rating (MacIntyre & Gregersen, 2021). To assess engagement in LBC, it is possible to use experience sampling by filming videos of learners' learning activities and then having them watch the videos while quantifying their engagement levels. However, there are two issues. First, filming videos requires a controlled experimental setting, which is difficult to achieve in LBC, where learners freely decide where, when, and what to learn, making it challenging to predict when engagement will occur. Additionally, since engagement has four constructs, if we were to use experience sampling to quantify engagement levels while watching videos, learners would need to watch the same video four times and input four engagement levels. As LBC sessions become longer, this increases the workload and may affect the accuracy of data collection.

According to Fredricks and McColskey (2012), the strengths of interviews lie in their ability to provide descriptive and detailed data on the causes of differences in engagement levels and how learners connect their learning experiences inside and outside the classroom. However, limitations include the fact that the interviews are retrospective and cannot verify specific factors influencing the learners, leading learners to respond based on assumptions about general trends (Ryu & Lombardi, 2015). Additionally, they cannot capture the real-time dynamics or progress of engagement. These limitations highlight the need for innovative approaches to evaluate engagement that can bridge the gap between the abundance of data available in diverse learning contexts and practical applications.

This study aims to assess the various trajectories of multidimensional engagement. To achieve this, it is essential to have a comprehensive understanding of different constructs that may interact during learners' engagement in the learning process. Therefore, it is recommended to employ multiple methods to evaluate engagement. This approach will provide deeper insights into contextual factors and help identify opportunities for targeted interventions (Fredricks & McColskey, 2012).

Snapshots to supplement interviews

There are various methods for investigating learner engagement, and it is necessary to consider the assessment approaches depending on the learning conditions such as LBC. This section discusses subject-specific multimodal snapshots that complement descriptive and detailed semi-structured interviews.

The aim of the stimulus is to trigger or refresh the recollection of cognitive processes, allowing them to be accurately recalled and verbalized (Gass & Mackey, 2016). In interviews, participants articulate their learning experiences outside the classroom. Snapshots offer a simple, learner-driven way to document these experiences in real time, providing a visual, context-rich prompt that enhances memory recall and supports more accurate, detailed reflection during interviews. As a stimulated recall tool, snapshots encourage learners to report specific actions linked to particular events, in contrast to self-reports, which usually offer more generalized information.

One of the advantages of snapshots is to enable learners to effortlessly document their learning experiences using mobile devices, selecting images that reflect their interests. According to Kress and Leeuwen (2020), visual structures, similar to linguistic structures, guide specific interpretations of experiences and shape particular forms of social interaction. Image-based semiotic resources may enhance metacognitive reflection, capture multidimensional aspects of engagement, and identify contextual and background factors influencing student engagement.

In this study, we propose using snapshots as a complementary tool to interviews when evaluating learners' engagement outside the classroom (e.g., after school, in the community, or online). Snapshots were selected because they enable learners to easily record their learning experiences, capture moments of engagement, and reinforce memories during interviews. This study examines whether snapshots, when used in conjunction with interviews, can deepen understanding of the constructs of learner engagement in specific and diverse learning contexts.

METHODOLOGY

Participants

The study was conducted at a small private university in a medium-sized city in Japan. To foster English education and international exchange, the university creates a supportive environment for students to learn English. From an initial pool of participants who completed a broader survey on out-of-classroom learning, eleven students with experience in learning beyond the classroom volunteered to participate in three monthly interviews. Of these, seven students responded and scheduled appointments for the interviews. Three participants were men, and four were women who spoke Japanese at home and had never spent time in a native English-speaking country. They were from first to fourth-year students, majoring in Education, Sociology, or Nutrition. The involvement with learning English beyond the classroom varied among the participants, but all had a certain degree of experience in learning outside of the classroom.

Data collection and data analysis

To examine how snapshots enhance memory recall and offer insights into the behavioral, cognitive, affective, and social aspects of learner engagement outside the classroom, semi-structured interviews were conducted to collect qualitative data on engagement. The interviews were held in Japanese, the participants' native language. Prior to the interviews, participants were asked to take snapshots of their learning activities outside the classroom. These photos served as prompts during the interviews, helping participants recall specific moments and reflect more deeply on their learning experiences. The discussions were conducted in person, centered around the photos (see Appendix 1 for the questions adapted from Lai, 2015). This combination of snapshots and interviews was designed to capture both real-time and reflective insights into the four dimensions of learner engagement: behavioral, cognitive, affective, and social.

The study received approval from the Institutional Review Board at the university in Japan on May 29, 2024, and from the Institutional Review Board at King Mongkut's University of Technology Thonburi on June 24, 2024 (Approval code: KMUTT-IRB-COA-2024-050). Following approval, seven students were selected for semi-structured interviews and provided with participant information sheets. The information was verbally explained in Japanese, their native language, to help them decide whether to sign the consent form. All seven participants agreed to participate and signed the consent form, which stated their right to withdraw from the study at any time. A written schedule and detailed project information were provided, and Japanese translations of all consent forms were made available. The individual in-person interviews were conducted in the researcher's office, each lasting about 30 minutes, between July 11, 2024 and January 10, 2025. During the interviews, participants discussed the photos they had taken of their out-of-classroom learning experiences, using these images as prompts to facilitate discussion and reflection.

Each interview lasted approximately 30 minutes and was audio-recorded, transcribed in Japanese, translated into English, and analyzed. The transcripts were thematically coded based on the criteria outlined in Table 1.

FINDINGS

Over a period of approximately six months, semi-structured interviews were held with seven participants, totaling 21 interviews (three interviews per participant). In each interview, participants were asked to bring 1–3 snapshots capturing scenes from their LBC activities. During the data collection period, two participants brought 1–2 snapshots, one participant brought three, one brought four, two brought six, and one participant did not bring any snapshots at all, citing the reason that he was unable to do any LBC.

Examples of snapshots provided by participants

Figure 1 shows the LBC snapshots of three participants who brought four to six snapshots/ with three snapshots posted for each participant. These nine snapshots were selected because the participants talked about them more than the other snapshots. For privacy reasons, snapshots have been processed so that individuals cannot be identified.

Participant 1	Photo 1	Photo 2	Photo 3
			

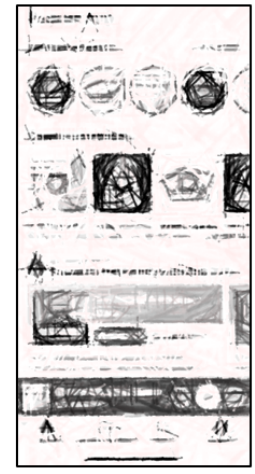
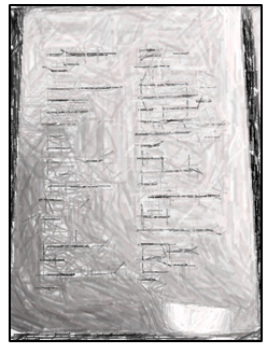
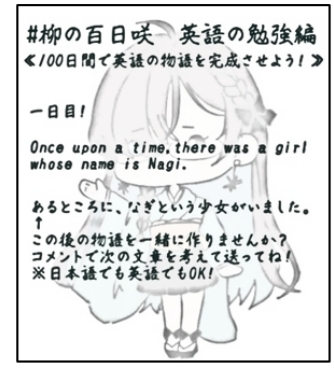
Participant 2	Photo 4 	Photo 5 	Photo 6 
Participant 3	Photo 7 	Photo 8 	Photo 9 

Figure 1 Snapshots of LBC provided by participants

Of the nine snapshots, five depict learning activities utilizing online technology, two depict university club activities and events, and two depict interactions with teachers and peers. All snapshots have been visually analyzed, and the interview transcripts were thematically analyzed to determine how snapshots facilitate memory recall and provide insights into four dimensions of learner engagement beyond the classroom.

Visual analysis

The snapshots were analyzed based on four elements of Visual Grammar: visual contact, distance, perspectives such as frontal, oblique, high angles, and modality from the aspects of color, contextualization, representation, depth, illumination and brightness (Liu, 2019). Table 5 shows the summary of visual analysis, followed by a brief explanation of representative snapshots: Photo 2, 5 and 9 in which LBC took place with peers, input online and output online. According to the visual analysis of the nine images, visual contact was mixed between offer and demand images. There were various types of social distance, including close-up, medium-shot, and long-shot. On the other hand, in terms of perspective, frontal views accounted for 7 out of nine images, with the remaining 2 being horizontal oblique and vertical high angle. Additionally, all nine images were classified as high modality.

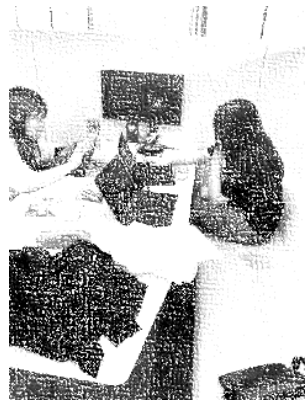
Table 5

Summary of visual analysis

Photo	Visual contact	Social distance	Perspective (H: Horizontal, V: Vertical)	Modality
1	Offer/Demand image	Close-up	H: frontal, V: frontal	High
2	Offer image	Medium shot	H: oblique, V: high angle	High
3	Demand image	Medium shot	H: oblique, V: high angle	High
4	Demand image	Long shot	H: frontal, V: frontal	High
5	Offer/Demand image	Medium shot	H: frontal, V: frontal	High
6	Demand image	Long shot	H: frontal, V: frontal	High
7	Offer/Demand image	Close-up	H: frontal, V: frontal	High
8	Demand image	Long shot	H: frontal, V: frontal	High
9	Demand image	Long shot	H: frontal, V: frontal	High

As examples of detailed visual analysis for each snapshot, the analysis results for Photos 2, 5, and 9 are shown below. The implementation status of LBC differs for each photo: Photo 2 is joint with peers, Photo 5 is input online, and Photo 9 is output online.

Photo 2: Interaction with peers



(1) Visual contact

There are two people looking at their laptops around a table. Since they do not make any direct eye contact with the viewers, this image can be classified as an “offer image” which does not urge viewers to take an action. However, the presence of the laptops that the two are making eye contact with is significant. There is a third laptop on the table, and next to it are a jacket and some handouts. Therefore, we can imagine that there is another study partner. This suggests that the person taking the photo is the third person.

(2) Social distance

The social distance is medium shot, indicating a close relationship between the photographer and the subjects in the photo. The photographer captured the seat where he was sitting. By deliberately photographing the empty seat, he may have been trying to show that he, as the interviewee, was actually learning there.

(3) Perspective
An oblique angle is adopted for the horizontal dimension, and a high angle for the vertical dimension. With an oblique angle, a wall is created between the subject and the photographer, while with a high angle, the photographer is expected to be in a position of power, protecting or supporting the subject.

(4) Modality
Modality can be high, because it is immediately apparent that they are close friends studying together. The subjects do not seem to concerned about being photographed. They seem to be concentrating on their studies and are not aware of the camera. The trust between the subjects and the photographer is evident.

Photo 5: Input online

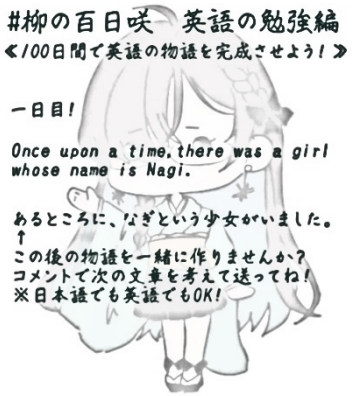
(1) Visual contact
It is a screenshot of a YouTube channel, Life Overseas, by the interviewer, Tarosac, who has black hair and Asian facial features. There are one demand image and one offer image. The demand image is a close-up shot of Tarosac's smiling face with direct eye contact in the icon. The offer image is a medium shot of him wearing sunglasses and interviewing an old man.

(2) Social distance
The close and medium shots create a feeling of a personal connection. In the medium shot, the young Youtuber and an elderly male look into each other's eyes as if they were close friends. They also stand very close to each other, close enough for the Youtuber to hold the microphone in front of the interviewee's face. There were no long shots, which may have created a sense of objectivity.

(3) Perspective
A frontal angle is adopted for both horizontal and vertical dimensions. The power balance between the subject of the image and the viewer is neutral. There is no sense of intimidation or flattery. It is a photograph taken from the front, symbolizing an equal relationship.

(4) Modality
Modality can be high, because a bright blue sky and the blue sea stretching out to the horizon, with a dazzling white sandy beach in front, the subject's hair and shirt blowing in the wind, the black T-shirt worn by interviewer Tarosac, and the interviewee's crisp white shirt are all included in the thumbnail image.

Photo 9: Output online



(1) Visual contact
This is a screenshot of a post introducing a project that a participant carried out online. She solicited ideas on social media and spent 100 days creating a story in English featuring a girl in the picture as the main character. The illustration of the girl makes eye contact, which can be seen as an image of demand. The girl wearing a kimono waves her hand in a friendly manner.

(2) Social distance
The long shot of the main character creates a sense of objectivity and reliability. Since it is a screenshot of an Instagram post, the content is open to public. The openness and recognition add more credibility to the image.

(3) Perspective
A frontal angle is adopted for both horizontal and vertical dimensions. An illustration of a girl's entire body is facing forward. Since the viewer's gaze is at the same level, it feels like an equal relationship. It may symbolize a sense of camaraderie, like teammates on a project.

(4) Modality
The project details are explained in text against a background of lightly toned-down illustration. The overall color scheme is green, and explanations are provided in both English and Japanese to create an atmosphere that welcomes broad participation.

In the next section, we will examine what kind of engagement occurred based on the participants' comments in the interviews.

Summary of stimulated recall by engagement type

The transcript of 21 interview sessions was thematically coded and full data was analyzed. but the summary of stimulated recall was presented only for selected three snapshots. Table 6 shows the quotes showing the evidence of stimulated recall, stimulated recall examples, and engagement characteristics and types on photos 2, 5 and 9.

Table 6

Thematic coding of transcript about photos 2, 5 and 9

Photo	Quotes showing evidence of stimulated recall	Stimulated recall examples	Engagement characteristics (Engagement type)
2	*We always get together to study. Maybe not always. About once every two weeks.*	Frequency of self-study group sessions	Time on task or participation Purposeful/Autonomy interaction (Behavioral, Affective, Social)
2	*Basically, we get together in our free periods, so it's about an hour and a half.*	Study session schedule and duration	Time on task or participation (Behavioral)
2	*When we study together, she [a friend] tries not to [touch her phone].*	The effect of joint study sessions on a friend's attitude toward learning	Positive attitude, Other-oriented (Affective, Social)
2	*At that time, I would say that we were relatively concentrated.*	Concentration level of participants in the self-study sessions	Focused attention (Cognitive)
2	*It's nice, after all. I feel more motivated when I do it with friends.*	Peer interaction and enhanced motivation	Positive attitude, Interaction (Affective, Social)
5	*I watched a video where a Japanese YouTuber interviews foreigners in English.*	Authentic English input	Action knowledge (Cognitive)
5	*I like this channel because I can learn natural English expressions.*	Interest in real-world English	Purposeful, Autonomy (Affective)
5	*Sometimes I repeat what they say or try to guess what the foreigner will answer.*	Shadowing practice and predictive learning strategies	Effort, Active involvement (Behavioral)
5	*Watching the video made me want to speak English like that in the future.*	Inspiration by the interactions	Other-oriented, Willingness (Social & Affective)
9	*I've added another challenge to that. Right now, we're all trying to write an English story together.*	Participating in a creative task regularly outside class	Active involvement, Interaction (Behavioral, Social)
9	*Everyone writes ideas in English. It's like a relay.*	Collaborative learning	Interaction, Self-oriented (Social)
9	*It's difficult, but I try to write something interesting in English.*	Using imagination and language skills	Focused attention (Cognitive)
9	*It's fun to read what other people write and continue the story.*	Enjoyment and curiosity	Positive attitude (Affective)

As the excerpt of thematic coding shows, descriptions were obtained regarding past LBC experiences, including the emotions and thoughts present at the time, as well as the social factors that influenced them and the resulting actions. Even if the description began with

superficial descriptions, participants became aware of emotions and cognitions that were evoked from their latent memories through their own reflection or follow-up questions from the interviewer.

DISCUSSION

In response to the research question "How do snapshots, when used alongside interviews, facilitate memory recall and provide insights into the behavioral, cognitive, affective, and social dimensions of learner engagement beyond the classroom?" we will discuss stimulated recall and assessing engagement below.

Snapshots as a memory recall of how engagement occurred

According to Gass and Mackey (2016), accurate memories of past events are clearly recalled through the use of videos, audio, text, and researcher prompts. The goal of stimulated recall is to reconstruct the thought processes that learners engaged in while performing a specific task. Snapshots record specific information such as what, when, where, who, and how. One participant commented, "They (snapshots) help me remember. I can put myself in the situation," regarding the use of snapshots. By looking at snapshots, participants were able to describe their LBC experiences in detail from various perspectives. For example, in photos 2, 5, and 9, even though the participants were not shown in the snapshots, there were explanations about their behavioral, cognitive, affective, and social engagement. Among these, affective statements related to motivation, desires, and joy regarding language learning emerged later. The affective aspects of learners' consciousness, which lie deep within their minds, may have been brought to the surface through the use of snapshots in reflection.

Snapshots for capturing four engagement constructs

The visual analysis also revealed that of the four items in visual analysis—visual contact, social distance, perspective, and modality—social distance and perspective were particularly related to the four engagement constructs, showing the relationship between the participants and the subjects, such as the emotions the participants feel toward the subjects, as well as the power dynamics and trust between them.

From the analysis of interview data, three keywords emerged that induce engagement. These are teacher/peer support, role models, and collaboration. Photos 1, 2, 3, 7, and 8 show teacher/peer support, photos 3, 4, 5, 6, and 7 show role models, and photos 2, 3, 7, 8, and 9 show collaboration. All three keywords are related to social engagement, and it has become clear that social engagement is more visible and impactful in out-of-class learning than other engagement constructs. Even when no people were visible in the snapshots, explanations of social engagement related to interactions with other people were confirmed for all photos. Interestingly, all five quotations in which engagement in multiple dimensions was observed were combinations of social engagement and engagement in another dimension.

- *We always get together to study. Maybe not always. About once every two weeks. (Behavioral, Affective, Social) (Photo 2, Participant 1)*
- *When we study together, she [a friend] tries not to [touch her phone]. (Affective, Social) (Photo 2, Participant 1)*
- *It's nice, after all. I feel more motivated when I do it with friends. (Affective, Social) (Photo 2, Participant 1)*
- *Watching the video made me want to speak English like that in the future. (Affective, Social) (Photo 5, Participant 2)*
- *I've added another challenge to that. Right now, we're all trying to write an English story together. (Behavioral, Social) (Photo 9, Participant 3)*

This suggests that social engagement has a ripple effect and that its influence is significant in dimensional interaction. As Zhou et al. (2020) point out, one reason for this strong influence may be that social engagement, unlike other dimensions, has a clearly relational nature and is aimed at interacting with and supporting others. From this, it is suggested that in LBC, factors such as teacher/peer support during club activities or self-study time, the presence of role-model YouTubers, and casual interactions with social media followers play important roles.

Snapshots as a method to assess learner engagement in LBC

The following statements were identified in the interview scripts as factors that led to engagement.

- *It's nice, after all. I feel more motivated when I do it with friends. (Peer interaction and enhanced motivation) (Photo 2, Participant 1)*
- *I like this channel because I can learn natural English expressions. (Interest in real-world English) (Photo 5, Participant 2)*
- *Watching the video made me want to speak English like that in the future. (Inspiration by the interactions) (Photo 5, Participant 2)*
- *It's fun to read what other people write and continue the story. (Enjoyment and curiosity) (Photo 9, Participant 3)*

Common points related to emotions, such as motivation, preferences, inspiration, enjoyment, and curiosity, were identified. In other words, affective triggers are considered to be effective factors in inducing engagement. Affective engagement is explicitly shown in snapshots, such as facial expressions. Since the three representative snapshots did not include learners, it was not possible to analyze emotions during learning using snapshots. However, by combining semi-structured interviews, we were able to obtain statements about learners' emotions at the moment they were engaged in LBC.

Snapshots have been shown to be a tool that combines the strengths of self-report and experience sampling. According to Fredricks and McColskey (2012), in self-report, learners select what they think best describes their engagement with multiple aspects. While practical, this tends to result in broad content that does not show what specific tasks or situations the

interviewees were engaged in. In experience sampling, detailed data about engagement at that moment can be obtained. On the other hand, a distinctive and advantageous feature of snapshots is that they record the situation at a specific time and place in detail as it is. Although the selection of LBC moments is subjective and therefore cannot be completely free from subjective influence, at least the scenes captured in snapshots can be analyzed objectively as shown in the visual analysis. Additionally, by having participants reflect on LBC moments in detail during semi-structured interviews, we were able to obtain data on all four constructs—behavioral, cognitive, affective, and social engagement—for all snapshots provided by the six participants. Thus, snapshots can be considered a tool that combines the strengths of self-report and experience sampling.

Regarding assessing the four engagement constructs, Zhou et al. (2020) state that since each dimension does not exist independently, they should be evaluated comprehensively. They suggest that it is important to investigate how multiple dimensions interact and overlap in the learning process. To this end, they propose integrating quantitative data obtained from temporal and different viewpoints with qualitative data obtained from more detailed and specific perspectives. In the visual analysis of this study, qualitative data was collected from a different perspective than interviews, and conducting quantitative visual analysis further strengthens data triangulation.

Reinders and Benson (2017) state that most studies have focused on learners in classrooms or classroom-based settings, and that it is necessary to understand how LBC experiences, which extend beyond the classroom, influence language use and learners and the learning process in general. In particular, research on LBC in online settings is limited. The ability of learners to record LBC using smartphones is expected to facilitate data collection for online learning. In fact, five of the nine representative snapshots provided by the three participants in this study were records of online learning activities. Therefore, the use of snapshots could serve as a practical solution for investigating LBC, where data collection is challenging.

CONCLUSION AND RECOMMENDATIONS

The findings from semi-structured interviews, combined with snapshots for stimulated recall and visual analysis of the snapshots for semiotic perspectives, provided a comprehensive insight into the moment of engagement in the learning beyond the classroom. Snapshots serve as memory aids, helping students recall and articulate past learning experiences. Participants photographed the moment and reflected on their learning from a viewpoint of multi-dimensional engagement. The photos act as triggers, prompting the recollection of significant learning moments and allowing students to discuss these experiences more effectively during interviews, as they can remember details that might otherwise have been forgotten including emotions they felt at the time. Snapshots also facilitate students in discussing and explaining their learning experiences, including aspects that are often not directly visible in the photos. As a result, the approach combining interviews with snapshots successfully demonstrated why learners engage with LBCs.

The study identified two key areas: facilitating memory and reflection and capturing the four dimensions of engagement. Through the enhanced stimulated recall of snapshots, the moments in the learning process surfaced vividly in the learners' reflections. The findings showed that snapshots combined with interviews offer a more comprehensive and holistic view of engagement than a single engagement measurement approach, particularly in informal and autonomous learning contexts. They can complement interviews and provide deeper insights into the learning process. Four types of engagement constructs, behavioral, cognitive, affective and social, were shown individually in their reflection.

The limitations of this study include variations in the amount of data collected. For example, the number of snapshots submitted by participants varied, with some submitting none and others providing up to six. Since the moments of learner engagement were selected by the participants themselves, there were instances where participants either forgot to record their activities or chose not to include activities they deemed unrelated to out-of-class learning. To enhance data collection rates, researchers could provide regular reminders to participants about recording their learning experiences.

This study did not impose restrictions on the locations or content of out-of-class learning, resulting in a wide variety of contexts. Participants used various technologies, such as apps, engaged in club activities, and held study sessions with friends, with settings ranging from the university campus to commuting time and home. If the study had focused solely on learning outside the university, it could have emphasized more autonomous learning.

Moreover, this study examined the learning behavior of participants over a six-month semester. A longer-term study, lasting an entire academic year and including extended breaks, would be valuable. This is important because out-of-class learning is often influenced by the workload associated with regular coursework. During periods when there are many assignments and regular exams, the amount of time available for LBC is limited.

Additionally, it would have been beneficial to collect not only photos but also short videos using smartphones. Combining experience sampling methods could have further enriched the data. One approach to further enhance assessment could involve combining interviews and snapshots with experience sampling. Classmoto is a mobile application designed to record L2 engagement levels, capturing real-time data on learners' experiences across various learning situations with minimal disruption (Bonner et al., 2023). Using mobile phones to collect both qualitative and quantitative data in learning beyond the classroom will simplify the data collection process and enhance its accessibility.

Ideally, by regularly prompting learners to take photos of their learning and use Classmoto to collect real-time engagement data, researchers can foster self-reflection on autonomous learning. This approach can provide deeper insights into how different engagement constructs interact, help identify critical moments, explore their impact on subsequent learning, and track the development of learner engagement beyond the classroom over time.

ACKNOWLEDGEMENT

We acknowledge the use of AI-assisted tools, Grammarly and DeepL, in refining and translating several sentences and paragraphs in this article. However, these tools were only used to improve clarity, coherence, and the academic tone of the article. We declare that all ideas, interpretations, and conclusions remain the original work and responsibility of the authors involved.

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Appendix 1
Semi-structured interview

Before the interviews: Ask the interviewees to take three photos of the current learning environment for English (people, resources, places, things you do) that has contributed to their language learning.

General questions

1. What major are you in?
2. How long have you been studying the language? What made you decide to study the language?
3. What are your goals for learning the language?
4. When you have some spare time to study the language, what do you usually do? Why? What do you think is the best way to learn the language?

(Look at the photos of language learning environment)

1. Now let's look at the photos of the things that have contributed to your language learning? Could you say something about each of them?

For each resource the interviewee talked about, ask the following follow-up questions:

1) How do you use/interact with the resource? How do you learn from the resource? (How often do you use it? Why? How do you use it and for what purpose? Why so?)
2) How do you view the learning experience with this resource? What role(s) does this resource play in your learning? How does it contribute to your learning?
3) Where did you get the idea that this resource could be used for learning?

2. How do you allocate your time among these different resources? Why so?
3. Are these different learning experiences connected to one other in some way? (If not, why not? If yes, in what way?)
4. Are there any resources available to you that might be helpful to your learning but you choose not to use? Why not?

*The questions are adapted from Lai (2015).