



# Exploring signs in nature: The vlog experiences of preservice teachers

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## Abstract

The growing disconnect between children and nature—driven by technological immersion, reduced green spaces, and heightened safety concerns—necessitates that preservice teachers acquire competencies to foster nature literacy in future generations. Grounded in Ajzen’s Theory of Planned Behaviour, this phenomenological study examined the experiences of 62 preservice teachers as they identified scientific clues in nature and translated them into vlogs. Data from reflective journals were analysed using inductive content analysis. Findings revealed that participants initially exhibited negative emotional responses due to inexperience and low technological self-efficacy. The phenomenon selection process involved progressive familiarization with natural environments, followed by decision-making shaped by individual characteristics, contextual variables, and information sources. Despite encountering challenges, participants demonstrated substantial gains across three interconnected domains: (1) Professional Development—authentic learning competencies, technological self-efficacy, and pedagogical knowledge; (2) Nature-Based Awareness—observation skills, environmental awareness, and emotional bonding with nature; and (3) Inner Development—enhanced curiosity, creativity, and psychological well-being. These outcomes underscore the importance of integrating technology-enhanced authentic tasks, structured field experiences in natural settings, and nature-focused projects into teacher education curricula. Such pedagogical approaches can strengthen preservice teachers’ perceived behavioral control, positive attitudes, and intentions to adopt nature-based technological practices, ultimately supporting their capacity to cultivate nature literacy in children.

**Keywords:** Clues in nature; Phenomenology; Teacher education; Technology integration; Vlogging

## 1. Introduction

In many modern societies, children and young people spend significantly less time outdoors compared to previous generations. The increasing use of technology, lack of green spaces, and concerns about risk and safety have contributed to a generation of children spending too much time indoors, creating an alarming disconnect between children and nature (Barrette et al., 2024). This disconnect is not only an environmental loss but also a threat to mental and physical health; for our connection to nature depends on how we understand, value, and interact with the natural world (Grace et al., 2021). This situation is prompting educators to seek new ways to empower students to engage more actively with the natural world around them. It is precisely at this point that nature literacy, defined as the ability to understand, value, and interact with nature, appears to serve as a significant component of the solution (Barrette et al., 2024; Grace et al., 2021). Therefore, to bridge this gap, it is essential that future teachers be equipped with the knowledge and skills to teach nature literacy in higher education and to read and discover the scientific principles and phenomena hidden within nature. To address this need, the present study builds on three complementary pedagogical components: nature-based learning as the educational setting, authentic assessment as the performance-based approach, and vlogging as the technology-supported tool for documenting and reflecting on natural phenomena.

Nature-based learning provides a theoretically meaningful setting for this study because it positions nature not merely as a physical location but as an active pedagogical context in which learners observe, interpret, and make sense of real-world phenomena. The literature conceptualizes nature-based learning as a broad educational approach that may occur in formal, non-formal, and informal settings and may vary in structure, guidance, and degree of learner autonomy (Jordan & Chawla, 2019). Within this perspective, natural environments serve as authentic contexts for connecting disciplinary knowledge with lived experience, particularly through observation, inquiry, and reflection. Place-based education further supports this rationale

by emphasizing the local community and environment as starting points for teaching scientific, social, and cultural concepts across the curriculum (Sobel, 2004; Webber, 2021). Recent literature suggests that well-designed nature-based, outdoor, and out-of-school learning experiences may support students' academic engagement and cognitive, affective, social, physical, and psychological outcomes, while also helping them perceive connections with the natural world and develop motivation toward environmental action (Aslan & Arabacı, 2023; Falzon & Conrad, 2023; Goode & MacGillivray, 2023; Mann et al., 2021; Wei et al., 2024). However, these benefits should not be assumed automatically; nature-based experiences require purposeful pedagogical design to move beyond simple exposure to nature toward systematic observation, interpretation, and meaning-making (Jordan & Chawla, 2019). In this respect, vlog practices can function as more than a digital documentation tool. By requiring students to record, narrate, edit, and share their encounters with natural phenomena, vlogging may support multimodal meaning-making, reflective thinking, learner engagement, and the translation of direct experience into communicable knowledge. A recent systematic review of educational vlogging reports that vlogs have been used to enhance learning and teaching outcomes, particularly by supporting reflection, engagement, feedback, and the connection between theory and practice (Hassan, 2023). Nevertheless, vlog-based learning may remain superficial if it is treated only as a media-production activity rather than as a structured reflective and analytical task. Therefore, the present study positions vlogging within nature-based learning as a pedagogically designed authentic assessment practice that connects direct observation in nature with reflection, communication, and nature literacy development.

To transform such nature-based and technology-supported learning experiences into assessable performances, an authentic assessment-oriented pedagogical framework can be used. Authentic performance tasks are particularly suitable for this purpose because they can align learning objectives, assessment evidence, instructional activities, and technology use, while enabling students to demonstrate applied understanding through meaningful products, reflection, and performance-based evidence (Alvarez et al., 2024; Eze et al., 2026; Uluçınar & Dinç, 2021; Žižanović, 2025). Higher education is undergoing a transformation in this direction. Universities' efforts to increase interaction with student groups, industry's employability needs, and academics' educational responsibilities have greatly expanded the promotion and adoption of authentic assessment over the past decade (Baines et al., 2025). Authentic assessments emphasize practical, applied skills that are important for students' post-university lives, directly relate to real-world applications, and offer a strong alternative to traditional assessments that do not develop transferable skills (Forsyth & Evans, 2019). Specifically, these assessments, which center on student participation, critical thinking, and problem-solving (Schultz et al., 2022), have a positive impact on learning, autonomy, motivation, and employability (Connolly et al., 2023). Authentic tasks that use nature as a classroom and laboratory can provide a meaningful pedagogical route for developing students' environmental and ecological literacy-related outcomes, particularly when they involve direct observation, inquiry, reflection, and action-oriented engagement with real environmental issues (Aslan & Arabacı, 2023; Fikri et al., 2026; Saputri et al., 2026; Uluçınar & Dinç, 2021; Zagkotas, 2026). In this context, authentic tasks situated in out-of-school learning environments can provide preservice teachers with opportunities to apply, transfer, and reinterpret classroom-based knowledge in real-life natural settings.

However, beyond these positive aspects, serious obstacles are also observed in practice. Research shows that authentic assessments are rarely adopted, while pen-and-paper exams continue to be prioritized. Teacher educators may resist this change due to their attachment to the current curriculum, limited professional development opportunities, and disciplinary differences (Gravett, 2025; Rawlussyk, 2018). Similarly, Mjenda and Kyaruzi (2025) found that teachers largely integrated traditional assessment techniques, such as written exams, into their courses, but rarely used task-based assessments, such as exhibitions, game-based assessments, observations, and project-based assessments. Taken together, these findings indicate that the limited use of authentic assessment is not merely a matter of individual teacher preference, but is also shaped by broader

institutional, curricular, and professional barriers. Therefore, rather than treating authentic assessment as a universally adopted practice, it is necessary to recognize the practical constraints that may limit its implementation in higher education. Despite these barriers, it remains critically important to include authentic learning tasks in teacher education programs, because such opportunities enable participants to apply and transfer the theoretical knowledge and skills they acquire in the classroom to real-life contexts.

Technology integration can strengthen the implementation of authentic assessment when it is pedagogically aligned with learning objectives, performance tasks, feedback processes, and evidence of student learning. Rather than functioning as a standalone solution, digital tools can serve as pedagogical enablers that make authentic assessment more interactive, multimodal, timely, and adaptable across learning contexts (Alvarez et al., 2024; Eze et al., 2026; Mnguni, 2023; Sattayaraksa et al., 2023; Uluçınar & Dinç, 2021). Digital tools can play an important role in overcoming the practical barriers to authentic assessment. Modeling pedagogical practices that combine authentic, performance-based opportunities for technology integration is important for ensuring that future teachers acquire the necessary pedagogical knowledge and skills (Cydis, 2015). The literature shows that technology integration supports participants' authentic, in-depth interaction with content and authentic learning (West & Malatji, 2021). Technology-supported authentic assessments can become continuous or iterative processes for participants, offering them multiple feedback opportunities from faculty members. This allows for synchronous interactions and/or discussions and asynchronous reflections to enhance participants' participation and active learning (Raynault et al., 2022). However, despite growing interest in the use of technology in authentic assessment, educators' understanding of why and how they choose to integrate these technologies is limited (Hu et al., 2025). For example, findings indicate that educators tend to adapt technologies they are familiar with and have access to rather than innovate to support student learning (Hu et al., 2025). Similarly, Mjenda and Kyaruzi's (2025) study also revealed that teachers' use of technology-supported assessment methods is influenced by contextual factors such as limited knowledge of different types of assessment tasks, limited experience in using technology, limited access to digital tools, and large class sizes.

### **1.1. Importance of the Study**

The current study is important because it brings together three interrelated requirements emphasized in the preceding discussion: the need to foster nature literacy, the need to support this literacy through authentic assessment, and the need to use technology as a means of documenting, reflecting on, and communicating authentic learning experiences. Seeking signs from nature in its natural environment allows participants to engage with nature as an authentic learning context, while the use of vlogs as a multimedia tool concretizes technology integration and makes the learning process visible, shareable, and reflective.

In this respect, the study not only offers a concrete model for developing nature literacy in teacher education but also serves as an example of how the pedagogical promises of authentic assessment and technology integration can be translated into practice. Rather than treating nature literacy as a purely conceptual or classroom-based outcome, the study approaches it as an experiential process involving observation, interpretation, reflection, and communication of natural phenomena. This integrated focus distinguishes the study from existing work by connecting nature-based learning, authentic assessment, and digital expression within a single pedagogical experience for preservice teachers.

### **1.2. Aim of the Study**

Based on this rationale, the aim of this phenomenological study is to reveal in depth the experiences of preservice teachers in discovering signs from nature and reflecting these discoveries through vlogs. More specifically, the study focuses on participants' initial reactions to the task, their decision-making processes while selecting natural signs, their experiences before, during, and after vlogging, and the perceived gains they obtained from this process.

Accordingly, the study seeks to answer the following research questions:

RQ 1) What are the initial feelings of participants when given the task of discovering clues from nature?

RQ 2) What is the decision-making process like when discovering nature's clues?

RQ 3) What are their experiences like in the process of reflecting nature's clues in vlogs?

RQ 4) What are the gains of participants when discovering nature's clues and reflecting their discoveries in vlogs?

## **2. Conceptual Framework**

### **2.1. The Use of Vlogs in Higher Education**

Vlogs, an extremely popular audiovisual content format among students, have been developed in recent years as a potential learning platform (Jordà & Rodrigo, 2021). Defined as asynchronous video blogs created by individuals to share their thoughts, experiences, and interests, vlogs are created by recording videos with mobile devices that have video recording capabilities and uploading them to online platforms (Snelson, 2015). According to Xie et al. (2021), vlogs are platforms that provide a richer visual experience than written blogs, containing embedded videos combined with supporting text and images. Creating a vlog is a typical multimedia production activity in which students organize and combine multimedia elements such as language, sound, video, and animation. A review of the research in teacher education reveals that vlogs contribute to the development of language skills, including listening, reading, writing, speaking, self-expression, and intercultural communication (Aldukhayel, 2021; Kimsesiz & Çetin-Köroğlu, 2023). In terms of affective and motivational outcomes, vlogs have been shown to reduce speaking anxiety and enhance motivation, participation, and motivational beliefs (Jin, 2023). Regarding cognitive and pedagogical development, vlogs support knowledge acquisition, critical thinking, reflective practice, peer learning, techno-pedagogical competence, and self-efficacy in language teaching (Debbag & Fidan, 2022).

### **2.2. Reading Nature's Signs**

This study examines the natural clues that preservice teachers discovered through their vlog experiences and is grounded in Tristan Gooley's (2014) *The Lost Art of Reading Nature's Signs*. The main purpose of this book is to restore modern humans' weakened relationship with nature and to help individuals acquire the ability to read the signs offered by the natural world. In the context of the present study, this perspective is important because it positions nature not merely as a physical setting but as a meaningful learning environment in which scientific events, principles, and relationships can be observed and interpreted.

Gooley's (2014) approach is based on the idea that nature functions as a holistic system in which the sun, wind, plants, animals, clouds, water, soil, shadows, and landforms provide interconnected clues. Small-scale signs in the environment may offer broader information about direction, weather, light, moisture, wind, or seasonal change. For example, moss on tree bark, the direction of shadows, plant growth patterns, or bird movements may become meaningful indicators when interpreted within their environmental context. However, these signs should not be read mechanically or in isolation; their meaning depends on location, season, surrounding conditions, and their relationship with other natural indicators. Gooley (2014) explains reading nature as a process that involves careful observation, contextual understanding, cross-verification, experimentation, and application in both natural and urban environments. This process begins with noticing visible signs in the environment, continues with interpreting them in relation to their context, and is strengthened by comparing multiple signs before reaching a conclusion. In this respect, reading nature's signs resembles scientific reasoning because it requires evidence gathering, comparison, and the refinement of interpretations through direct experience. To support this approach, Gooley (2014) discusses a wide range of natural signs, including the language of the sky, traces of wind, plant indicators, animal behaviours, hydrological and geological signs, astronomical guidance, seasonal changes, and natural clues in urban

environments. In the present study, these ideas provide a conceptual basis for understanding signs in nature as observable clues that may reveal scientific phenomena, principles, or relationships embedded in the natural environment.

Thus, the concept of reading nature's signs functions as a bridge between nature-based learning, authentic assessment, and vlogging. Nature-based learning provides the real environment in which signs can be observed; authentic assessment turns this observation into a meaningful performance; and vlogging allows preservice teachers to document, explain, and communicate their interpretations through a multimodal digital format. In this sense, reading nature's signs establishes the conceptual foundation for examining how preservice teachers experience the process of noticing, interpreting, and presenting natural phenomena in a technology-supported authentic assessment context.

### **2.3. The Theory of Planned Behaviour**

The Theory of Planned Behavior [TPB], developed by Ajzen (1985, 1991) as an extension of Fishbein and Ajzen's (1980) Theory of Reasoned Action, explains how attitudes toward a behavior, subjective norms, perceived behavioral control, and behavioral intentions contribute to the performance of that behavior. In Ajzen's (1991) theory, perceived behavioral control, which is related to Bandura's (1982) concept of self-efficacy, was added to the attitudes and beliefs that function as direct antecedents of behavior in the Theory of Reasoned Action. Ajzen (1991) formulated that these three concepts directly influence intentions and, together with intention, indirectly contribute to the performance of behavior.

The theory explains intentions through three conceptually independent determinants. The first is attitude toward the behavior, which refers to the extent to which an individual has a favorable or unfavorable evaluation of the behavior in question. The second determinant is subjective norm, a social factor that refers to the perceived social pressure to perform or not perform the behavior. The third determinant is perceived behavioral control, which refers to the perceived ease or difficulty of performing the behavior and is assumed to reflect both past experiences and anticipated obstacles. As a general rule, the more favorable the attitude and subjective norm toward a behavior, and the greater the perceived behavioral control, the stronger the individual's intention to perform that behavior is expected to be (Ajzen, 1991). Intention is regarded as the direct antecedent of actual behavior. However, the degree of behavioral performance depends not only on intention but also on non-motivational factors, such as the availability of necessary opportunities and resources (Ajzen, 1991).

In the present study, the Theory of Planned Behavior was adopted as a theoretical lens for understanding preservice teachers' experiences of discovering signs from nature and reflecting these discoveries through vlogs. This lens was considered appropriate because the vlog-based authentic assessment task required participants to engage in intentional behaviors involving nature exploration, observation, interpretation, technology use, and communication. Within this framework, attitude toward the behavior refers to participants' evaluations of discovering signs in nature and representing them through vlogs, such as the perceived enjoyment, value, difficulty, or workload of the task. Subjective norms refer to the perceived influence of peers, educators, family members, and other social actors who may provide feedback, modelling, or support during the process. Perceived behavioral control refers to participants' sense of confidence or difficulty in reading nature's signs, accessing natural environments, using digital tools, recording videos, editing content, and completing the vlog task.

Accordingly, TPB provides a coherent framework for interpreting the cognitive, motivational, social, and behavioral dimensions of the vlog-based authentic assessment experience. Rather than positioning the vlog task only as a measurement tool, this perspective enables it to be understood as a technology-supported authentic learning practice that may shape preservice teachers' attitudes, perceived social influences, perceived control, and future intentions regarding nature-based and technology-integrated teaching practices.

### 3. Research Methodology

#### 3.1. Research Design

This research was designed using a phenomenological approach aimed at gaining an in-depth understanding of participants' experiences of discovering phenomena in nature through vlogging. This method was chosen because it aimed to comprehend the participants' emotions related to the performance, their processes of accessing nature's clues and making decisions, their experiences before, during, and after the vlog, as well as the gains they obtained from this performance (Greenwalt, 2008).

#### 3.2. Participants

The study group consisted of 62 student teachers enrolled in the elective course on out-of-school learning environments. Of these participants, 40 were female and 22 were male. Since the course was offered as an elective course open to students from different teacher education programs, the participants represented a multidisciplinary group. Based on the course enrolment context, students came from science education, special education, preschool education, primary school education, elementary mathematics education, and social studies education programs. Participants were in their second, third, or fourth year of undergraduate study. However, because departmental affiliation and grade-level information were not collected as separate demographic variables during data collection, their exact numerical distribution by department and year level could not be reported. Therefore, gender distribution is presented numerically, whereas department and grade-level characteristics are described categorically.

#### 3.3. Research Context and Implementation Process

The task of discovering signs in nature through vlogging was carried out by participants as part of the 'Out-of-School Learning Environments' course. The following steps were followed during this process.

##### 3.3.1. *Establishing connections between out-of-school learning and the performance of searching for signs in nature*

In this context, it was emphasized how out-of-school learning can extend beyond formal venues such as museums or science centres to take place in authentic environments such as national parks, and its role in nature education. The experiences and contributions that national parks offer to students were examined; the aim was for students to identify plant and animal diversity in these environments, understand the phenomena and events in the ecosystem, and comprehend the benefits they provide to humanity.

##### 3.3.2. *Explaining the connection between signs from nature and disciplines*

Attention is drawn to the relationship between the information taught in the classroom and the phenomena that can be observed in nature but are often overlooked. It is emphasized how the concepts, phenomena, and formulas in the curricula of disciplines such as physics, chemistry, biology, geography, and mathematics can be seen through careful observation in nature.

##### 3.3.3. *Presenting examples related to signs in nature*

Photographs and video examples were shared via a PowerPoint presentation to help participants understand the connections between clues in nature and different disciplines. For example:

- The concept of symmetry in mathematics through the position of spots on ladybug shells and butterfly wings and the structure of fern leaves.
- The Fibonacci sequence and fractal geometry through the arrangement of pinecone shells.
- The relationship between the binomial expansion and the growth pattern of tree branches.

In addition, participants were shown a video of birds flying in a "V" formation in the sky and asked to brainstorm. This example emphasized that the air currents created by the wing

movements of the birds allow the birds behind to expend less energy, thus establishing a connection between the laws of aerodynamics in physics and the topic of energy.

#### 3.3.4. *Enriching nature-related clues*

After explaining the connections between disciplines and natural phenomena in the previous stage, Tristan Gooley's book *The Lost Art of Reading Nature's Signs* was introduced to enrich the examples. Then, selected sections from the book were read as a class with the aim of developing a deeper understanding of natural phenomena. The text (Turkish version) in Appendix 1 explains signs about the colour spectrum in the rainbow. After reading the selected sections from the book, the entire class was asked to read the book in order to broaden their perspectives on signs in nature and prepare for the vlog recording task they would carry out in the next stage.

#### 3.3.5. *Drawing attention to the role of vlog performance in capturing signs from nature*

Since nature itself is an authentic learning environment, participants need to see, recognize, and interpret clues related to nature for themselves. To fulfil this need, capturing the clues they discover through vlogging is expected to be an effective performance in the active and authentic learning process.

#### 3.3.6. *Introducing vlogging, explaining the vlog creation process and principles*

At this stage, the main outlines of the task and expected outcomes were explained in detail to participants, and examples were provided to illustrate what a vlog is. In addition, a guide containing points that participants should pay attention to during the vlog creation process was shared via the Learning Management System [MOODLE], and the relevant text is provided in Appendix 2.

#### 3.3.7. *Implementing, reflecting on, and evaluating the vlog*

After sharing and confirming the validity of the phenomena they learned from the book with the researcher, the participants recorded these signs by shooting vlogs in out-of-school environments such as parks, forests, or lakes. The recorded vlogs were uploaded to folders created by the researcher on Google Drive. The reflective diaries of participants who uploaded their vlogs were matched with their vlog submissions, and only participants who had submitted both documents were included in the analysis. Since the participants' experiences with vlogging were the focus of this research, the research diaries reflecting their experiences during the vlogging process were evaluated. The research also aimed to understand the experiences gained by the participants throughout the process through semi-structured interview questions (Appendix 3).

### 3.4. **Data-Gathering Tools**

Participants were given a semi-structured interview form to reflect on their experiences during the performance process. Through this form, the following information was collected: their feelings and thoughts at the beginning of the performance, their processes of selecting and deciding on a nature phenomenon, vlogging experiences, and the gains they acquired from the process.

### 3.5. **Data Analysis**

The data were analysed by following Braun and Clarke's (2006) six-phase thematic analysis method: (1) Familiarizing yourself with your data, (2) Generating initial codes, (3) Searching for themes, (4) Reviewing themes, (5) Defining and naming themes, and (6) Producing the report. Each sentence was read line by line, and initial codes such as uncertainty, unease/fear, reluctance, and excessive workload were generated inductively from the participants' writings. Similar codes were classified according to categories. For instance, uncertainty and reluctance constituted the category of amotivation, while first vlog experience and technology deficiency were combined under the category of novice. These categories were then integrated into two overarching themes: Constraining motivational states and facilitating motivational states.

During the analysis process, codes, categories, and themes were continuously reviewed using

the constant comparison method, considering their similarities and differences, and the process of forming themes from codes was completed smoothly. As a result of the qualitative analysis, a total of 25 categories were structured around 10 themes, and the relationships among the categories, themes, research questions, and figures were clarified.

### **3.6. Trustworthiness of the Research**

To enhance the trustworthiness of the study, strategies such as thick description, coding reliability, and reflectivity were employed.

#### *3.6.1. Thick description*

To enable readers to explore the extent to which the findings may or may not be applicable beyond the specific context in which the data were generated, the researchers fully reported the entire process up to the participants' production of vlogs, the coding steps of the data, and the methodological characteristics of the study (Willig, 2013).

#### *3.6.2. Intercoder reliability*

To ensure coding reliability, the two researchers first developed a shared understanding through collaborative coding. Subsequently, data from ten participants were coded independently, and the intercoder agreement rate was calculated as 85%. Following this phase, the researchers completed the coding process independently; this procedure enhanced the reliability of the coding.

#### *3.6.3. Reflexivity/Role of the researchers*

In accordance with the principle of reflexivity, the role of the researchers must be articulated in reports to illuminate how the research process shapes participants' understandings (Willig, 2013). The first author conducts qualitative research on out-of-school learning environments and student experiences, while the second author specializes in technology-enhanced nature and environmental education. Both researchers collaboratively developed the vlog performance guidelines and the reflective diary prompts. Furthermore, the first author was responsible for implementing the vlog task. Finally, both authors contributed to the data analysis process.

#### *3.6.4. Ethical considerations*

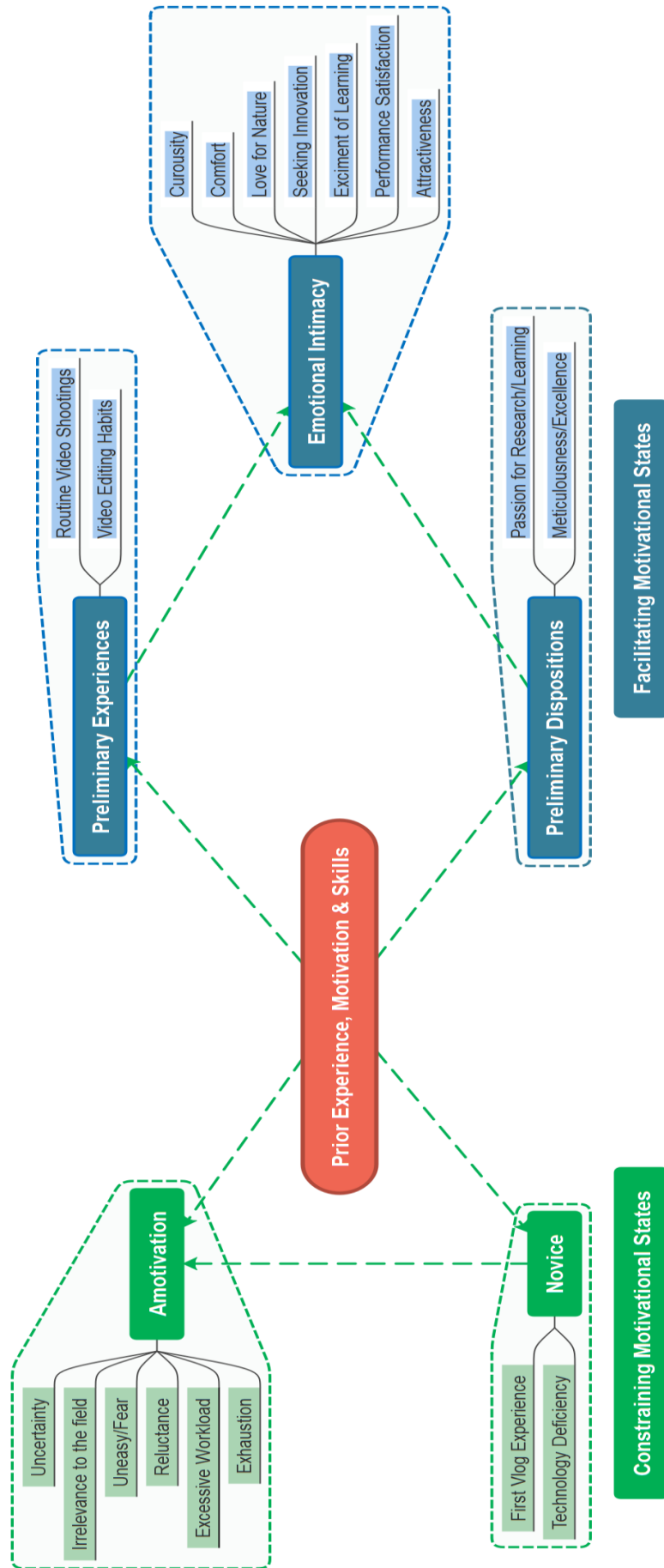
Ethical approval was obtained from the relevant institutional ethics committee (ID. 2026-58). Throughout the research, data collection, storage, and analysis were conducted in accordance with principles of integrity, transparency, and respect for participants' rights. No personally identifiable information was disclosed at any stage. To enhance clarity and readability, AI-assisted tools (e.g., DeepL and ChatGPT-5) were used solely for language refinement and grammatical corrections.

## **4. Findings**

This section presents findings pertaining to participants' experiences during the vlog. Figure 1 illustrates participants' initial reactions to the vlog task, as addressed in Research Question 1 (RQ1).

As illustrated in Figure 1, participants' initial responses to the vlog task reflected how they positioned themselves at the beginning of the experience. These responses showed that participants did not approach the task only as a technical assignment; rather, their reactions were shaped by their previous experiences, motivational readiness, and perceived ability to complete a vlog-based nature task. Some participants initially experienced the task as unfamiliar, demanding, or anxiety-provoking, particularly because they had limited experience with vlogging and were uncertain about how to transform natural observations into a digital product. Others, however, approached the task with greater curiosity and willingness, supported by their interest in nature, previous experience with video recording, or positive expectations about learning through exploration.

Figure 1  
Participants' Initial Reactions to the Vlog Performance



## 4.1. Constraining Motivational States

### 4.1.1. Novice

The novice category indicates that participants' initial reactions were strongly shaped by unfamiliarity with vlog-based performance. For many participants, the task required them to combine several skills that they had not previously used together, such as observing nature, recording video, speaking in front of a camera, editing, and adding explanatory text. Therefore, novice status was not limited to a lack of technical experience; it also reflected uncertainty about how to transform a natural phenomenon into a meaningful digital product. One participant expressed this initial hesitation as follows:

At first, I was worried because I had never recorded a vlog or designed a video with texts on it before; however, I realized that it was not as difficult as I had expected. (IU-M)

This quote shows that participants' sense of being novice emerged from the combined demands of technology use, self-presentation, and nature-based observation. It also indicates that this initial uncertainty could be reduced once participants began to experience the task and recognized that the performance was manageable.

### 4.1.2. Amotivation

The amotivation category reflects participants' initial hesitation and low motivational readiness toward the vlog task. This hesitation did not indicate a complete unwillingness to participate; rather, it emerged from the uncertainty, anxiety, and perceived difficulty associated with an unfamiliar performance. Some participants initially found the available areas unrelated to the task, while others felt uncertain about what to record, feared producing an unsatisfactory outcome, perceived the task as an additional workload, or described the process as tiring. The prominence of nervousness and fear suggests that participants' amotivation was largely shaped by the perceived demands of completing a task that required both nature-based observation and vlog production.

One participant clearly expressed how unfamiliarity with vlogging, uncertainty about phenomenon selection, and fear of performance quality created initial anxiety:

Since I had never recorded a vlog before, I was worried about how I would do it. I experienced indecision about which phenomena to choose. I had fears about whether I would be able to achieve a good result. (CD-F)

This quote shows that amotivation was not simply a lack of interest. Rather, it was closely related to participants' uncertainty about the task requirements and their doubts about whether they could produce an acceptable vlog. Another participant emphasized the role of workload in shaping the choice of environment and the way the task was approached:

Since I was a senior student, my workload was already quite heavy, so I thought Atapark would be suitable. (YK-F)

This statement indicates that amotivation was also connected to contextual and academic pressures. Participants' decisions were shaped not only by their interest in nature or vlogging but also by practical concerns such as time, workload, and accessibility. Thus, amotivation in this study refers to a broader state of initial difficulty in which uncertainty, anxiety, workload, and perceived task demands limited participants' motivational readiness at the beginning of the vlog experience.

## 4.2. Facilitating Motivational States

The other sub-theme of participants' initial responses shows that the vlog-based nature task was not experienced only through hesitation or uncertainty. For some participants, the task also created a sense of interest, curiosity, and readiness to engage with nature. Their positive orientation was shaped by affective closeness to nature, previous familiarity with video-based practices, and personal dispositions such as interest in research, learning, and careful task completion. In this sense, facilitating motivational states refer to the conditions that made the task appear more approachable, meaningful, and engaging at the beginning of the process.

#### 4.2.1. Emotional intimacy

Emotional intimacy reflects the participants' positive emotional orientation toward both nature and the vlog task. For these participants, the task was not perceived merely as a compulsory course requirement; rather, it created an opportunity to explore nature, learn through direct experience, and move beyond the routine boundaries of classroom-based learning. Feelings such as curiosity, love of nature, interest, novelty-seeking, excitement about learning, comfort, and performance satisfaction showed that some participants approached the task with a sense of affective readiness and personal engagement.

One participant expressed this emotional connection and sense of exploration as follows:

I was excited to be close to nature. The time I spent on my classes was spent at home because they were online. In the out-of-school learning environments class, I set out to learn and explore, first with a museum tour and then with a nature vlog, leaving the home environment where I could both learn and take action. (AK2-M)

This quote indicates that emotional intimacy supported participants' engagement by connecting the vlog task with curiosity, movement, exploration, and direct contact with nature. It also shows that the task helped the participant experience learning as an active and embodied process rather than as an activity limited to the home or classroom environment.

#### 4.2.2. Preliminary tendencies

Preliminary tendencies refer to participants' existing personal dispositions that made them more willing to engage with the vlog-based nature task. In this category, participants' interest in research and learning, careful attention to the task, and willingness to explore new forms of performance supported their initial engagement. These tendencies show that some participants approached the task not only as a course requirement but also as an opportunity to ask questions, conduct research, and experience a new way of learning.

One participant clearly expressed how an existing interest in research and learning shaped their engagement with the task:

I am someone who loves researching and learning very much. First, while our instructor was giving examples about this assignment, I noticed that I was listening to the topic with full attention. The topic attracted my interest a lot. Then questions immediately started to come to my mind. Afterwards, I began to conduct research on this topic. The idea of recording a vlog excited me very much, and I had a very enjoyable memory while recording the vlog. (ERİ-F)

This quote shows that preliminary tendencies functioned as a facilitating factor by increasing participants' readiness to engage with the task. The participant's interest in research and learning transformed the vlog assignment into a personally meaningful process characterized by attention, curiosity, questioning, investigation, and enjoyment. Thus, existing dispositions toward learning and exploration supported participants' motivation from the beginning of the experience.

#### 4.2.3. Preliminary experiences

Preliminary experiences show that some participants approached the vlog task with greater confidence because they had already been familiar with video recording in their daily lives. For these participants, the task did not represent a completely new or intimidating performance. Their previous experience with recording and editing videos reduced the perceived difficulty of the assignment and helped them engage with the task more comfortably. In this sense, prior experience functioned as a facilitating factor by transforming the vlog task from an unfamiliar academic requirement into an activity connected with participants' existing habits and interests.

One participant explained how routine video recording experiences supported their engagement with the task:

In my daily life, I record vlogs during the trips I take and on special days for me. Since I had this experience, this assignment did not challenge me. On the contrary, because it was an area I liked, I did it with great enjoyment. I also did not have difficulty with video editing because I had knowledge about it. (DP-F)

This quote indicates that previous familiarity with vlogging and video editing strengthened the participant's confidence and reduced the sense of difficulty associated with the task. It also shows that when the task overlaps with participants' existing interests and everyday practices, vlog-based performance can be experienced not as a burden but as an enjoyable and manageable learning activity.

Figure 2 illustrates participants' decision-making process regarding nature's signs in response to Research Question 2 (RQ2).

### 4.3. Access to Environment

Participants' decision-making about nature's signs began with how they encountered the environment in which the signs were located. Rather than seeking distant or extraordinary natural settings, many participants turned to familiar and accessible places in their everyday lives. This shows that the task encouraged them to recognize that nature's signs could be found not only in forests, parks, or travel destinations, but also in ordinary living spaces. In this sense, entering the environment was not merely a physical act of going outdoors; it also involved becoming attentive to the natural elements already present in participants' immediate surroundings.

One participant explained how an everyday view from home became the starting point for selecting a natural phenomenon:

When I look outside from the window of my house, I directly see pine trees and the nests that birds have built on those pine trees. Therefore, I decided on the pine tree phenomenon in this way. (SÇ-F)

This quote shows that familiar surroundings became a source of inquiry once participants began to look at everyday natural elements through the lens of nature's signs. It also indicates that the vlog task helped participants transform ordinary observations into meaningful learning opportunities by encouraging them to notice, interpret, and communicate natural signs embedded in daily life.

### 4.4. Selection of Phenomenon

Participants' selection of a natural phenomenon was shaped by the interaction of environmental conditions, personal relevance, and available sources of information. In other words, participants did not choose nature's signs randomly; they evaluated what was observable in their surroundings, what attracted their interest or seemed useful to them, and which sources could help them understand or justify their choices. This process shows that phenomenon selection was both contextual and interpretive. Participants first noticed possible signs in their environment, then connected these signs with their own interests, prior knowledge, or practical needs, and finally used books, classroom examples, internet searches, academic sources, or social support to make sense of their selections.

#### 4.4.1. Contextual characteristics

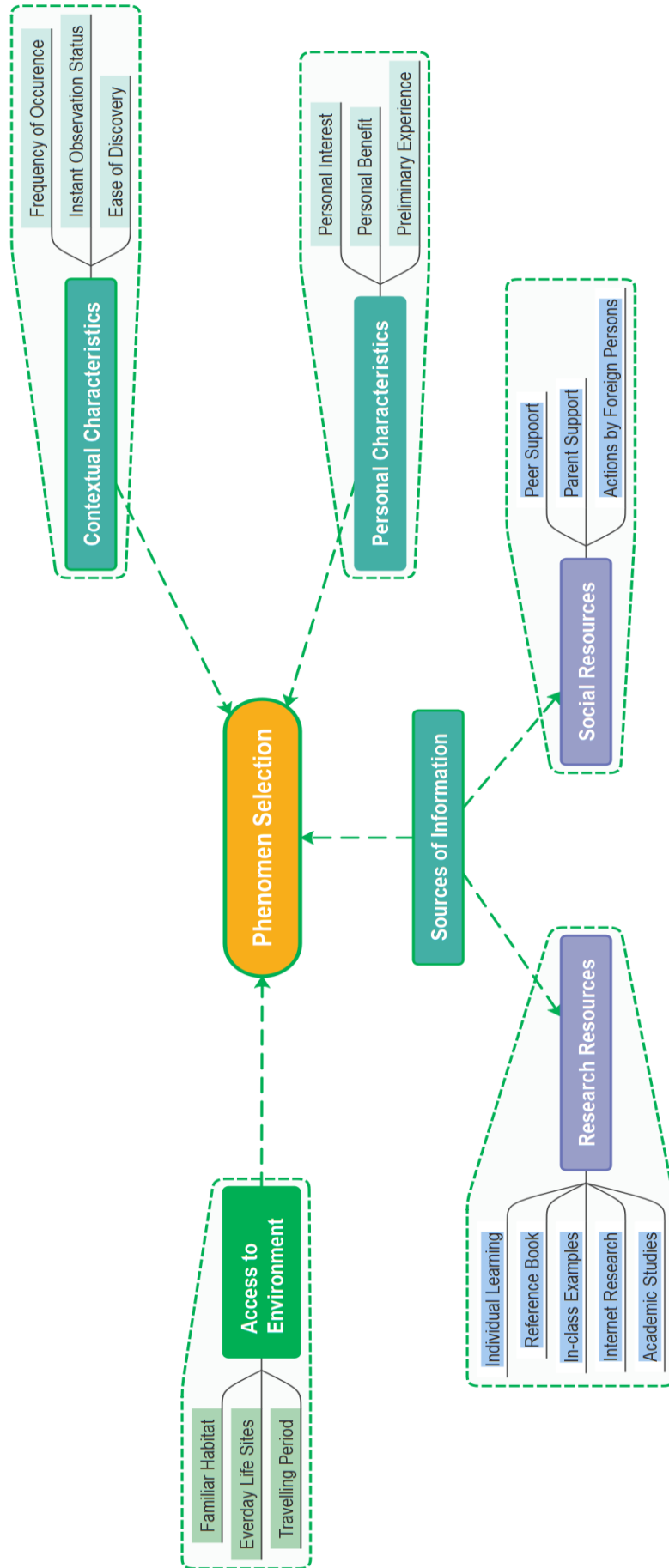
Contextual characteristics show that participants' selection of natural phenomena was strongly shaped by what they could easily access, observe, and discover in their immediate surroundings. Rather than searching for distant or unusual examples, participants tended to focus on phenomena that were visible and reachable within their everyday environments. This indicates that the decision-making process was influenced not only by interest in the phenomenon itself but also by practical conditions such as accessibility, direct observability, and ease of discovery.

One participant explained how accessibility guided the selection process:

I focused on phenomena that I could access more easily. However, I realized that I could find traces of every phenomenon within the campus area of Uşak University. (EÜ-M)

This quote shows that contextual characteristics helped participants recognize the richness of their immediate environment. The participant initially sought easily accessible phenomena, but the process also led to the realization that the university campus itself contained multiple natural signs suitable for observation and interpretation. Thus, accessibility did not limit the learning

Figure 2  
Participants' Decision-Making Process Regarding Nature's Signs



experience; rather, it helped participants notice that meaningful natural phenomena could be discovered within familiar and nearby settings.

#### 4.4.2. Personal characteristics

Personal characteristics show that participants' selection of natural phenomena was influenced not only by what they could observe in the environment, but also by what they found personally meaningful, useful, or familiar. In this sense, phenomenon selection was shaped by participants' interests, prior experiences, and the practical value they attributed to particular natural signs. Some participants chose phenomena because these signs were connected to their own lives or to knowledge used within their family context.

One participant explained how practical usefulness and family knowledge influenced the decision to select the walnut tree:

I decided to record the walnut tree because it helps my family estimate the direction of the wind during the day. I benefited from my family during the decision-making process. (NK-F)

This quote indicates that participants' choices were not based solely on the visibility of natural phenomena. Rather, their decisions were also shaped by personal relevance, everyday usefulness, and familial knowledge. In this case, the walnut tree became meaningful because it was connected to a practical function in daily life, showing how nature's signs can be interpreted through both observation and lived experience.

#### 4.4.3. Sources of information

Sources of information show that participants' phenomenon selection was guided not only by what they directly observed in nature, but also by the resources and people that helped them interpret these observations. Participants used structured resources such as reference books, classroom examples, internet searches, academic studies, and individual learning to understand which natural signs could be meaningful for their vlogs. These sources helped them connect visible natural elements with scientific or interpretive meanings and provided a basis for justifying their selections.

One participant emphasized the role of the reference book in identifying meaningful natural indicators:

Using the book *The Lost Art of Reading Nature's Signs*, I selected examples such as the message given by soil colour and the way the mossy side of trees can show direction. (RÇ-M)

This quote indicates that the reference book functioned as a guide for transforming ordinary natural elements into interpretable signs. Soil colour and moss on trees were not selected merely because they were visible, but because the participant could associate them with broader environmental meanings through the book.

Another participant described how classroom examples and internet research together shaped the decision-making process:

I thought about where I could find the examples I had listened to in class in the district where I live. When I searched on the internet, I found a place like Gölbaşı, surrounded by nature, and saw that there were water lilies, pinecones, various trees, and flowers. Actually, the water lilies attracted my attention the most. That is why I decided to go there. (İÜ-F)

This quote shows that participants' selections were shaped through a combination of prior classroom learning, online searching, and personal attention to particular natural elements. In this case, the participant first used classroom examples as a starting point, then searched for an appropriate environment, and finally selected the phenomenon that attracted the most interest. Thus, information sources supported phenomenon selection by helping participants move from general awareness to a more focused and justified choice.

In addition to research-based sources, participants also drew on social sources when selecting a natural phenomenon. They consulted peers or family members, received suggestions, and were influenced by others' observations. Thus, social interaction helped them expand their options, evaluate possible phenomena, and make more confident choices.

One participant described this process as follows:

I wanted to choose topics such as a natural phenomenon in nature, a species I observed, or an interesting natural landscape. When making my decision, I gathered ideas from people around me, experts on nature, and by researching online. (YH-M)

This quote indicates that participants' phenomenon selection was shaped by individual inquiry, social consultation, and research-based exploration. Rather than relying on a single source, they combined personal observations with others' ideas and online information to interpret natural signs and justify their final selection.

As addressed in Research Question 3 (RQ3), participants' vlogging experiences are presented in Figure 3.

Participants' vlogging experiences unfolded as a process rather than a single act of video recording. The task required them to prepare for the performance, manage the emotional, technical, and environmental demands of recording, and then reflect on the quality and meaning of the completed vlog. In this sense, vlog creation involved a sequence of planning, situated performance, and post-performance evaluation, through which participants negotiated both the challenges and learning opportunities of technology-supported authentic assessment.

#### 4.5. Pre-vlogging Processes

Before recording their vlogs, participants had to prepare themselves for both the nature-based and technology-supported aspects of the task. This preparation was shaped by two contrasting conditions. On the one hand, some participants encountered difficulties related to access, weather, environmental conditions, personal readiness, and technical competence. On the other hand, some preparatory factors, such as planning, environmental suitability, and interest in nature, helped them approach the task more confidently. Thus, the pre-vlogging process reveals how participants negotiated both the barriers and supportive conditions that shaped their readiness before the actual recording began.

##### 4.5.1. Challenges

The challenges experienced before and during vlog production show that the task was shaped by real-world conditions rather than by a fully controlled classroom environment. Participants had to manage not only the technical and performative demands of recording a vlog, but also environmental, personal, and situational constraints. Difficulties related to technological competence, access to suitable settings, crowded or noisy environments, individual readiness, health-related concerns, and weather conditions sometimes interrupted the recording process or made participants feel less comfortable while performing the task.

One participant emphasized how the public and crowded nature of the filming environment affected the vlog recording process:

I felt excited and a little nervous. Since the place I went to was open to the public, it was crowded, with too many people and too much noise. Therefore, while recording the videos, I had to stop halfway and start recording again. Apart from this, I did not experience any difficulty. (İÜ-F)

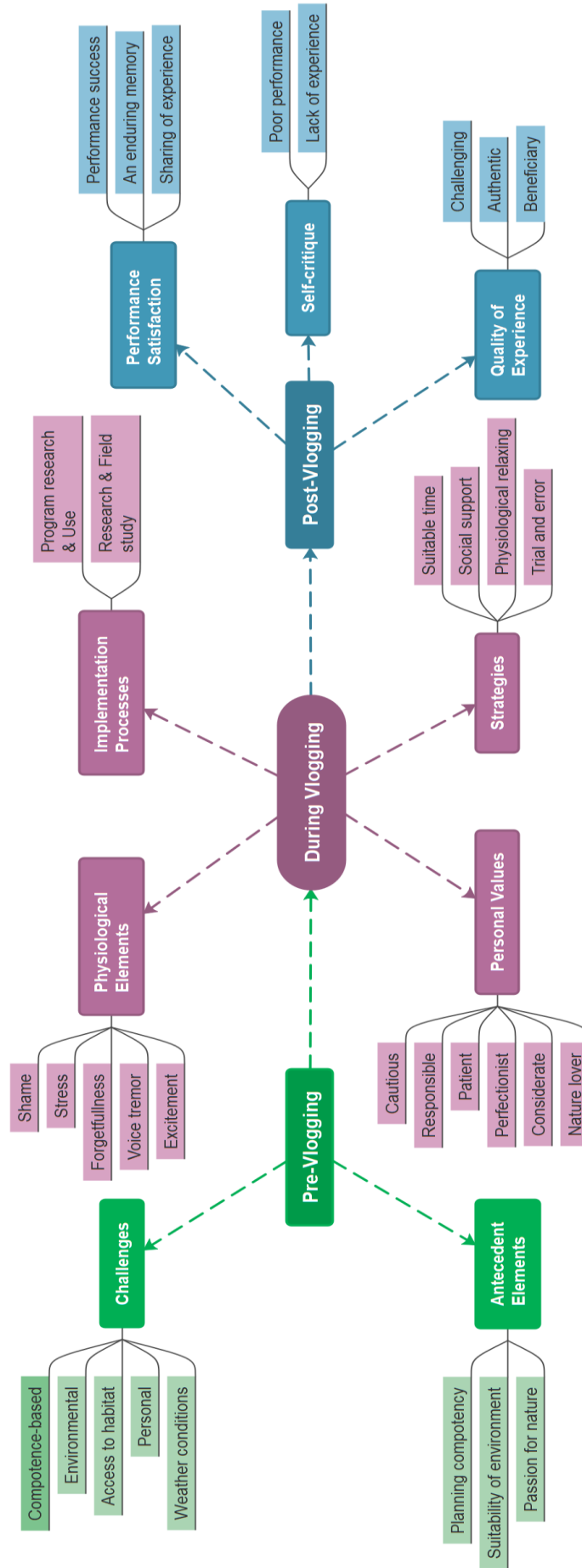
This quote indicates that environmental conditions influenced both the technical flow of filming and the participant's emotional experience. The need to stop and restart the recording shows that vlog production in authentic environments required participants to adapt to uncontrolled contextual factors such as noise, crowding, and public visibility.

Another participant drew attention to how personal health-related concerns shaped the experience before filming:

Actually, I cannot say that it was very difficult. I just cannot move very comfortably in nature. Since I have some allergic reactions and I do not get along very well with insects, that part challenged me. (DP-F)

This statement shows that challenges were not limited to technology or environment alone. Individual conditions, such as allergies or discomfort with insects, also affected participants'

Figure 3  
Participants' Experiences Before, During, and After Vlogging



readiness to engage with nature-based vlog production. Thus, the challenges experienced in this process reflected the combined demands of authentic outdoor settings, personal circumstances, and technology-supported performance.

#### 4.5.2. Antecedent elements

Antecedent elements refer to the preparatory conditions that helped participants approach vlog production more confidently before the actual recording began. These elements show that successful vlog creation depended not only on participants' willingness to engage with nature, but also on their ability to plan the process, identify suitable environmental conditions, and observe nature attentively. For some participants, the task became more manageable and meaningful when they were able to combine interest in nature with careful preparation and sensitivity to the right time and place for recording.

One participant emphasized the importance of preparation, observation, and timing before starting the vlog shoot:

The vlog shooting process related to searching for nature's signs was a very exciting experience. Being in nature offered a wonderful opportunity to explore and record. In this process, correct timing and careful observation were important for capturing the beauties of nature. (FG-M)

This quote indicates that antecedent elements supported participants' readiness for the vlog task by linking excitement about nature with planning and careful observation. It also shows that participants perceived vlog production as a situated performance requiring attention to environmental suitability, timing, and the visual qualities of the natural setting.

### 4.6. Processes during Vlogging

During vlog shooting, participants' experiences were shaped by the emotional, personal, practical, and strategic dimensions of performing in an authentic environment. The recording process required them not only to capture natural signs but also to manage their bodily reactions, personal values, technical application skills, and solution strategies. In this sense, the vlog shooting process emerged as a situated performance in which participants negotiated excitement, stress, responsibility, technical production, and problem-solving while trying to represent nature's signs meaningfully.

#### 4.6.1. Physiological elements

Physiological elements reflect the bodily and emotional reactions participants experienced while performing in front of the camera. During vlog production, participants were not only expected to record and explain natural signs; they also had to manage feelings such as excitement, stress, embarrassment, voice trembling, and momentary forgetfulness. These reactions show that vlog creation was experienced as a form of self-presentation as well as a technical recording task. For some participants, these bodily responses were more intense at the beginning of filming but gradually decreased as they continued recording and became more comfortable with the process.

One participant expressed this experience as follows:

I was afraid I couldn't do it; then I started the video, my voice trembled from excitement, and I relaxed towards the end. (NK-F)

This quote indicates that physiological reactions were closely related to the performative nature of vlogging. The participant's fear and trembling voice show the initial pressure of recording oneself, while the sense of relaxation toward the end suggests that confidence increased as the participant became more familiar with the task during the recording process.

#### 4.6.2. Personal values

Personal values reflect the qualities that shaped participants' persistence, care, and emotional investment during vlog production. For some participants, the process required patience, responsibility, prudence, perfectionism, thoughtfulness, and love of nature. These values influenced how they approached the task, especially when they were not satisfied with their

recordings or when they tried to capture nature's signs more carefully. In this sense, vlog production was not experienced only as a technical task; it also became a process in which participants' personal standards and commitment to the task became visible.

One participant described how patience and attention to quality shaped the recording process:

I deleted the videos I had recorded many times and started new ones. I re-recorded every video that I thought was not good enough. Each time, I managed to be patient. Even in the places I visited, I tried to look for signs of nature and record them. It was a difficult but enjoyable process. (CD-F)

This quote shows that personal values supported the participant's persistence throughout the vlog task. The repeated deletion and re-recording of videos indicate attention to quality and perfectionism, while continuing to search for nature's signs even during visits suggests a strong sense of responsibility and engagement. Thus, personal values shaped participants' conduct by encouraging them to continue improving their performance despite the difficulty of the process.

#### 4.6.3. *Application skills*

Application skills reflect the practical and technical abilities participants needed while producing their vlogs. The process required them not only to observe a natural phenomenon in the field, but also to make decisions about how to organize, edit, and present their recordings in a coherent digital format. In this sense, vlog production involved a combination of fieldwork, research, video editing, sound arrangement, text placement, and problem-solving. Participants had to adapt their technical decisions to the conditions they encountered during recording.

One participant described this process as follows:

The vlog shooting process was challenging. First, I thought a lot about the stage of deciding on the phenomenon, and then about how to edit the videos and adjust the video sound. I combined the videos I had recorded for the video. I placed the texts on the video in a compatible way. Since the environment where I would record the video was windy, I added the sound later using a video editing program. (MEK-F)

This quote shows that application skills were closely related to adaptive problem-solving. The participant had to make several practical decisions, from selecting the phenomenon to combining video clips, adding text, and solving the sound problem caused by wind. Thus, vlog production required participants to integrate nature-based observation with digital editing skills and to revise their technical choices according to environmental conditions.

#### 4.6.4. *Solution strategies*

Solution strategies reflect how participants responded to the difficulties they encountered during vlog production. Rather than remaining passive when they faced problems, participants tried to make the process manageable by choosing suitable filming times, seeking support from others, relaxing physically, and using trial and error. These strategies show that vlog production required participants to adapt to unexpected difficulties and gradually improve their performance through practice and support.

One participant explained how repeated practice and social support helped them overcome the difficulties experienced during filming and editing:

The recording was more difficult than I expected because I mispronounced some words while speaking during the video, and therefore I had to re-record it several times. This made it a little challenging for me. To overcome these difficulties, I practiced frequently, and after a while, my recordings became easier. Another difficulty was combining my videos, and I received help from my friend on this issue. (TA-M)

This quote shows that participants used both individual and interpersonal strategies to manage the vlog production process. The participant overcame speaking-related difficulties through repeated practice and addressed video-editing problems by seeking help from a friend. Thus, solution strategies helped participants transform initial obstacles into manageable parts of the learning process.

## 4.7. Post-vlogging Processes

After completing their vlogs, participants' experiences shifted from recording the performance to evaluating what the process meant for them. At this stage, they reflected on the quality of their completed videos, the extent to which they were satisfied with their performance, and the difficulties or limitations they noticed in their own work. These reflections show that post-vlogging was not merely the end of the task; rather, it became a moment of self-evaluation in which participants assessed their achievement, recognized areas for improvement, and reconsidered the overall value of the experience.

### 4.7.1. Performance satisfaction

Performance satisfaction reflects participants' positive evaluation of the completed vlog and the sense of achievement that emerged after the task. For some participants, satisfaction was not limited to finishing the assignment; it was also related to enjoying the final product, seeing their effort become visible, and developing a willingness to continue similar practices in the future. In this sense, watching the completed vlog became a moment of self-recognition and reinforced the value of the experience.

One participant expressed this satisfaction as follows:

When I watched the vlog I had recorded again and again, I realized that I liked it very much and that I should continue recording this kind of vlog in the future. (SA-F)

This quote shows that performance satisfaction strengthened the participant's positive perception of vlog production. The act of repeatedly watching the completed vlog indicates enjoyment and pride in the final product, while the desire to continue creating similar vlogs suggests that the experience may have supported future willingness to engage in vlog-based practices.

### 4.7.2. Self-critique

Self-critique reflects participants' awareness of the limitations in their vlog performance and their ability to evaluate their own learning process after completing the task. For some participants, this awareness emerged through recognizing low performance, lack of experience, shyness in front of the camera, difficulties in producing the intended video length, or technical limitations during recording. In this sense, self-critique did not simply indicate dissatisfaction; it also showed that participants were able to identify what they could not do as planned and how they tried to compensate for these limitations.

One participant described this reflective process as follows:

At first, I was very embarrassed because I was even shy about recording a video, but now I recorded one. As for the difficulties, I had planned to produce a longer video, but the duration did not match what I intended. Secondly, because my hand was not used to it, I could not show the images fully while recording. I solved this by adding photos to the video during editing for the parts I could not show. (EÇ-F)

This quote shows that self-critique involved both recognizing performance limitations and developing compensatory solutions. The participant acknowledged shyness, inexperience, and technical difficulty, but also identified the completion of the vlog as progress. Adding photos during editing indicates that self-criticism was accompanied by problem-solving and an effort to improve the final product despite the limitations experienced during filming.

### 4.7.3. Quality of experience

Participants described the experience in different ways; for some, it was challenging because it required unfamiliar forms of observation, recording, and editing, while for others it was authentic because it involved direct engagement with nature. However, the dominant view was that the experience was beneficial, as it helped participants notice natural phenomena more consciously and understand that even ordinary events in nature may have broader meanings and effects.

One participant described this beneficial aspect of the experience as follows:

The process was enjoyable. One finds oneself thinking, 'Wow, do these things happen too?' I observed how even the simplest events affect many things. (YY-M)

This quote shows that the vlog experience supported participants' awareness and interpretation of nature's signs. The participant's surprise at noticing ordinary natural events suggests that the task encouraged a more attentive way of looking at nature. Thus, the quality of experience was associated not only with enjoyment, but also with developing a deeper appreciation of how simple natural phenomena can be connected to broader ecological and scientific relationships.

The vlogging experience produced effects that extended beyond the completion of the task itself. Participants' reflections showed that the process contributed to their personal awareness, their relationship with nature, and their professional learning as preservice teachers. In other words, the vlog task was experienced not only as a technology-supported performance, but also as a learning process that supported inner growth, more attentive engagement with the natural environment, and the development of competencies relevant to future teaching practice. Figure 4 presents these interrelated areas of development in response to RQ4.

#### **4.8. Internal Development and Dynamics**

Participants' reflections on inner change showed that the vlog experience influenced both how they perceived themselves and how they experienced their own personal development. This dimension of the findings points to a process in which participants became more aware of their growth, interests, and emerging sense of competence while also reporting changes in curiosity, creativity, emotional relief, and well-being. Thus, the effects of vlogging were not limited to professional or nature-based learning; they also involved participants' inner awareness and personal transformation.

##### *4.8.1. Internal dynamics*

Internal dynamics reflect participants' growing awareness of their own development during the vlog-based nature task. This dimension shows that participants did not only learn about natural signs; they also began to recognize how their previous interaction with nature had often been limited, unconscious, or taken for granted. Through the task, some participants became more aware of the need to observe nature deliberately and to interpret natural elements as meaningful clues.

One participant explained this awareness as follows:

I was very impressed by nature's signs. For example, using natural elements to find direction or interpreting the direction of the wind through vegetation made me realize that I had previously interacted with nature mostly unconsciously and that I needed to be more aware. (ŞAE-F)

This quote indicates that internal dynamics involved a reflective awareness of personal growth. The participant's realization shows that the vlog task contributed not only to recognizing natural signs, but also to reconsidering their own relationship with nature. In this sense, the experience supported a form of self-development awareness by helping participants move from ordinary contact with nature toward more conscious and intentional observation.

##### *4.8.2. Internal development*

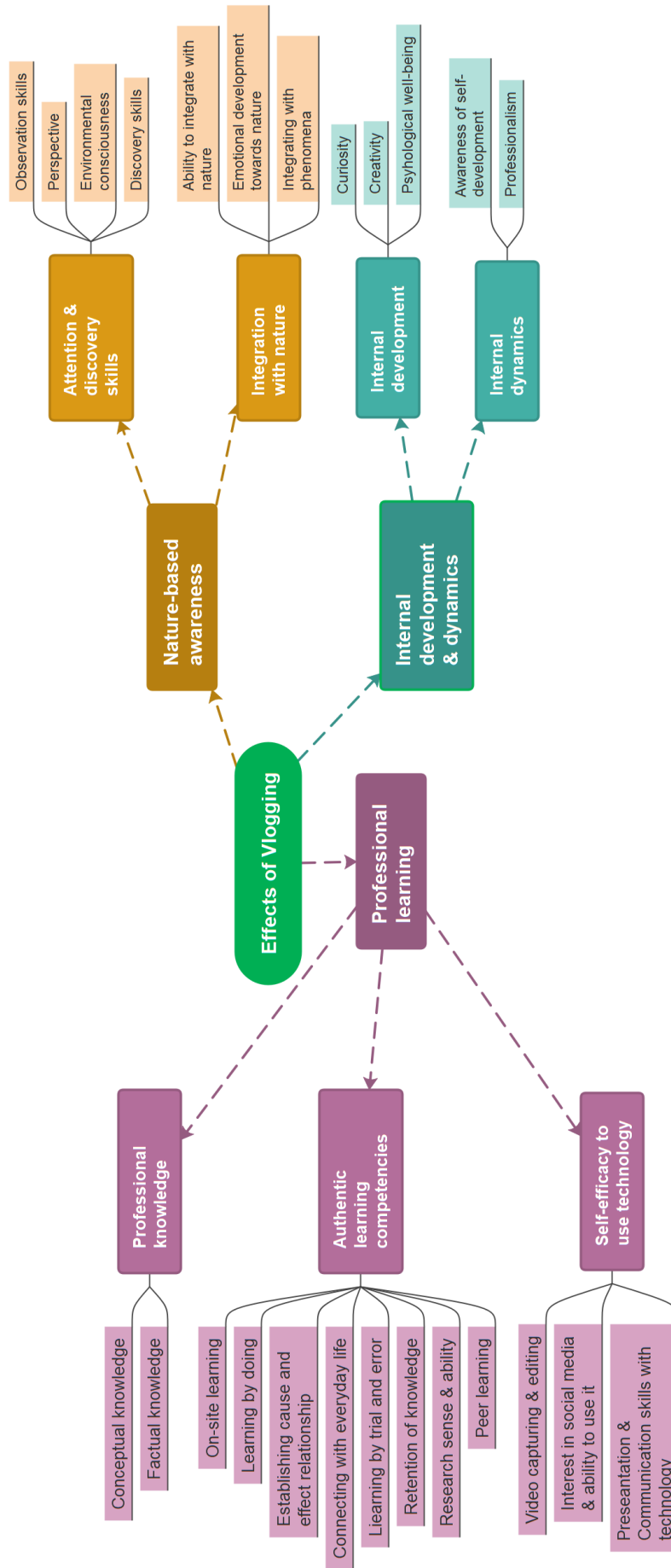
Internal development reflects participants' perceived personal and emotional gains from the vlog-based nature task. Beyond learning about natural signs, some participants experienced the process as a source of curiosity, creativity, calmness, and psychological well-being. In this sense, the task supported not only observation and interpretation, but also emotional relief and a more positive inner state through direct engagement with nature.

One participant described this emotional effect as follows:

The experience made me feel unexpectedly peaceful and relaxed. It reduced my stress and helped me get rid of negative energy. (FCA-M)

This quote indicates that internal development involved more than cognitive learning. The participant's emphasis on peace, relaxation, stress reduction, and the removal of negative energy

Figure 4  
Effects of Vlog Creation on Participants' Development



shows that the vlog-based nature task also created an emotionally restorative experience. Thus, engaging with nature through vlogging contributed to participants' inner development by supporting psychological well-being alongside observation and learning.

#### 4.9. Nature-based Awareness

Participants' reflections also showed that the vlog experience strengthened their awareness of nature and their way of engaging with the natural environment. Through the task, they began to observe natural phenomena more carefully, notice details that they had previously overlooked, and interpret these details as meaningful signs. This dimension of the findings indicates that nature-based awareness involved both a more attentive way of looking at the environment and a more direct, meaningful connection with nature.

##### 4.9.1. Attention and discovery skills

Attention and discovery skills reflect participants' growing ability to observe, notice, and interpret natural signs more consciously. Through the vlog task, participants began to look at nature not only as a familiar environment but also as a source of meaningful clues. This process helped them recognize that animal traces, plant growth cycles, weather indicators, and other natural details could provide information about the functioning of the natural world.

One participant explained this development as follows:

Through these signs, I understood that I could read the language of nature. For example, we can understand the presence of animals from tracks, follow the changes in plants' growth cycles, or interpret weather conditions correctly. I realized that understanding nature's signs can help us better understand the natural environment and become more harmonious with the nature we interact with. (FG-M)

This quote shows that attention and discovery skills involved more than simply noticing natural objects. The participant began to interpret natural signs as indicators of broader environmental processes. In this sense, the vlog experience supported environmental awareness by helping participants develop a more attentive, interpretive, and relational way of engaging with nature.

##### 4.9.2. Integration with nature

Integration with nature reflects participants' direct and meaningful engagement with the natural world through the vlog task. Rather than learning about nature only at a theoretical level, participants had the opportunity to closely observe natural elements, interact with phenomena, and test previously learned information in real settings. This process helped them develop a more personal and experiential connection with nature.

One participant described this experience as follows:

Frankly, I felt relaxed and peaceful. Since my childhood, I had not examined plants and animals in detail for many years. While recording this vlog, I got as close to them as possible. I looked at what they were like and what they were doing. I once again understood that the world does not consist only of us humans. Also, although we had learned in primary school that anthills indicate direction, perhaps for the first time in my life I tested this knowledge. Through this vlog study, I eliminated an important deficiency of mine. (AK2-M)

This quote shows that integration with nature involved both emotional and experiential dimensions. The participant's feelings of relaxation and peace indicate an affective connection with nature, while closely observing plants and animals reflects direct interaction with natural phenomena. Testing the knowledge about anthills also shows that the vlog task helped transform previously learned theoretical information into firsthand experience. Thus, connecting with nature supported participants' awareness that humans are part of a broader living world and helped them develop a more meaningful relationship with natural signs.

#### 4.10. Professional Learning

The vlog experience also supported participants' professional learning as preservice teachers.

Their reflections showed that the task helped them connect learning with real-life experience, use technology more confidently for educational purposes, and develop knowledge about natural signs that could inform their future teaching practices. In this sense, professional learning was not limited to gaining information about nature; it also involved developing authentic learning competencies, technological confidence, and pedagogically relevant knowledge through a situated and practice-based task.

#### 4.10.1. *Authentic learning competencies*

Authentic learning competencies reflect how participants transformed direct engagement with nature into a situated learning experience. Through the vlog task, participants did not only observe natural phenomena; they also connected these observations with scientific knowledge, related them to daily life, learned by doing and experiencing, developed cause-and-effect reasoning, conducted research, and benefited from peer learning. In this sense, the task supported authentic learning by enabling participants to construct knowledge in a real environment rather than receiving it only through classroom-based explanation.

One participant explained how the vlog performance supported learning through observation, experience, and the connection between daily life and scientific knowledge:

The vlog performance enabled me to observe nature, establish cause-and-effect relationships between daily life and scientific knowledge, and actively take part in a process of learning by doing and experiencing while discovering some information within nature during the video recording. (BG-M)

This quote shows that authentic learning competencies emerged through the combination of direct observation, contextualized inquiry, and active participation. The participant's emphasis on linking daily life with scientific knowledge indicates that the vlog task helped transform nature into a meaningful learning context where knowledge could be experienced and interpreted.

Another participant highlighted how the task encouraged curiosity, research, and causal questioning:

I researched why soil is brown as my topic. I questioned why soil is brown rather than green, yellow, or another colour. I became curious and started to research. As I researched, I became informed. While exploring research about soil, I also learned about other unknown issues. (ERİ-F)

This quote indicates that authentic learning was also supported through inquiry and research. The participant's initial question about soil colour led to further investigation and broader learning, showing that the vlog task encouraged participants to move from simple observation to curiosity-driven exploration. Thus, authentic learning competencies in this study were reflected in participants' ability to connect natural phenomena with scientific reasoning, daily life, research, and experiential learning.

#### 4.10.2. *Self-efficacy to use technology*

Self-efficacy to use technology reflects participants' developing confidence in using digital tools for educational and communicative purposes. Through vlog production, participants did not only record natural phenomena; they also had to make technical decisions about video capture, editing, sound arrangement, text placement, and the organization of visual materials. In this sense, the vlog task created an opportunity for participants to transfer their existing technological knowledge into practice and to develop new digital production skills through problem-solving.

One participant described this process as follows:

The vlog shooting process was challenging. First, I thought a lot about the stage of deciding on the phenomenon, and then about how to edit the videos and adjust the video sound. I combined the videos I had recorded for the video. I placed the texts on the video in a compatible way. Since the environment where I would record the video was windy, I added the sound later using a video editing program. (MEK-F)

This quote shows that technology self-efficacy was developed through practical engagement with the demands of vlog production. The participant had to combine video clips, arrange text,

solve an audio problem caused by environmental conditions, and use an editing program to complete the final product. Thus, the vlog task helped participants experience technology not merely as a tool for recording, but as a medium for organizing, improving, and communicating their observations of nature.

#### 4.10.3. Professional knowledge

Professional knowledge reflects the factual and conceptual learning that participants gained through the vlog task. The process helped them recognize specific signs in nature and understand the scientific meanings behind these signs. In this sense, professional knowledge was not limited to learning isolated facts; it also involved developing conceptual awareness about how natural phenomena are connected to direction, time, weather, plant growth, animal behavior, and patterns in daily life.

One participant described the factual knowledge gained during the process as follows:

While walking in nature, I became aware of a natural world full of clues. It helped me understand that tree roots indicate the direction of the sun, the Big Dipper tells time, a butterfly passing by me can be a clue about the weather, and a budding flower points south. (AYK-F)

This quote shows that the vlog task helped the participant notice concrete natural indicators and interpret them as meaningful environmental clues. The examples of tree roots, the Big Dipper, butterflies, and budding flowers indicate that factual knowledge was developed through direct attention to signs embedded in nature.

Another participant emphasized the conceptual learning gained from exploring different natural phenomena:

"It contributed to my learning about information in nature, such as why the sun appears flattened from below in sunset views, where moss is found and how it benefits people, what the Fibonacci sequence means and where it appears in our daily life, the characteristics of anthills and how they benefit people, and how weather events occur." (BG-M)

This quote indicates that professional knowledge also included conceptual understanding. The participant did not only identify natural signs but also connected them with broader concepts such as optical appearance, moss growth, Fibonacci patterns, anthill structures, and weather formation. Thus, the vlog task supported professional learning by helping participants transform natural observations into factual and conceptual knowledge that could inform their future teaching practices.

## 5. Discussion and Conclusion

This study aimed to reveal the experiences of participants in discovering clues from nature and reflecting their discoveries in vlogs. In line with this objective, the findings regarding participants' experiences were interpreted from the perspective of the TPB components (attitudes, beliefs, perceived behavioural control, behavioural intention, and behaviour).

### 5.1. Initial Reactions to Vlog Performance

Vlog diaries revealed that participants initially displayed novice status and amotivation during the vlogging process. Within the context of TPB, three key factors negatively influenced these initial thoughts.

First, participants' perceived behavioural control, directly linked to Bandura's self-efficacy beliefs, was considerably low. Since most had no prior experience with authentic assessment tools like vlogs, they lacked confidence in using such technologies. This weakness in technology self-efficacy, coupled with feelings of uncertainty, anxiety, and fear of performance, fundamentally weakened their intention to perform the behaviour (Miller, 2017). In addition to perceived lack of control, participants' attitudes toward the behaviour were negative. Their evaluation of vlog integration as exhausting, creating excessive workload, and sometimes irrelevant to the field led them to focus more on negative outcomes than benefits. These negative outcome expectations adversely affected their attitudes and further reduced their already fragile motivation (Miller,

2017). Finally, participants' perceptions of subjective norms did not support technology integration. The education system's continued emphasis on traditional exams and educators' strict adherence to the existing curriculum (Gravett, 2025; Rawlussyk, 2018) conveyed that innovative technologies are not expected or encouraged. Furthermore, educators' preference for familiar technologies (Hu et al., 2025) meant participants lacked strong modelling and encouragement in their social environment, resulting in weak subjective norms.

On the other hand, participants with prior experience in routine video recording and editing, as well as tendencies such as passion for research/learning, meticulousness, and a habit of video editing, experienced curiosity about performance, love of nature, comfort, novelty seeking, excitement about learning, performance satisfaction, and a sense of fulfilment. Within the context of TPB, these findings form a meaningful connection. First, prior experience with routine video recording and editing provided participants with a strong belief (high self-efficacy) that they could use this technology effectively, thereby increasing their perceived behavioural control. This supports Finnegan's (2021) findings that teachers' practice with new technology prior to use is critical for enhancing self-efficacy. Additionally, Walter's (2024) study, consistent with both Finnegan's (2021) findings and our own, confirms that such past experience and knowledge accumulation are fundamental elements reinforcing technology self-efficacy.

Secondly, findings such as 'curiosity, love of nature, comfort, and seeking innovation...' indicate that these participants developed an extremely positive attitude toward vlogging. Boyce's (2023) findings, which support these results, reveal that attitude toward technology plays a key mediating role in the relationship between technology experience and readiness. Similarly, in Walter's (2024) study, 'beliefs about technology' and 'motivation' emerge as a theme, pointing to the importance of attitude. Within the context of TPB, these parallel findings demonstrate that technology experience increases perceived behavioural control (technology self-efficacy), which reinforces positive beliefs, attitudes, and motivation toward technology, ultimately strengthening the intention to use it.

Third, participants with prior technology experience largely exhibited personal tendencies such as 'passion for research/learning' and 'meticulousness'. As noted in Boyce (2023) and Walter (2024), this indicates that perceived control and positive attitudes developed through technology experience foster a learner identity among participants. This identity, being consistent with the norms of an innovative and learning-promoting environment, indirectly supported their behaviour through subjective norms. Ultimately, Bai et al. (2024) emphasized that technological knowledge, positive attitude, and high self-efficacy strongly fostered behavioural intention and that these variables had a sequential mediating effect. The findings of the current study validate this complex network of relationships, clearly demonstrating that high perceived control and positive attitudes, fuelled by prior experience, positively shape participants' intentions and motivations to use vlogs.

## 5.2. The Decision-making Process for Nature's Signs

Participants' vlogging of natural phenomena involves a two-stage decision-making process: accessing the environment and selecting phenomena.

Participants' choice of familiar environments—whether from daily life or trips—reflects high physical and psychological accessibility, enhancing perceived behavioural control through comfort and competence. In selecting phenomena, factors such as ease of discovery, immediacy of observation, and prior experience similarly shaped participants' confidence in performing the task. For example, easily identifiable signs increased perceived control, thereby strengthening intention (Ajzen, 1991). The prominence of personal interest and benefit in phenomenon selection indicates a positive attitude toward vlogging, alignment with personal needs or curiosity enhanced motivation. Prior experience further contributed to more favourable attitudes and perceived meaningfulness of the activity.

Social influences—such as peer and family support and others' actions—reflect the subjective norm component of the TPB. Participants were affected by the expectations or behaviours of

valued individuals; for example, peers' vlogging or family encouragement reinforced perceived social norms. External sources like reference books, classroom examples, internet research, and academic studies helped legitimize participants' actions and indirectly shaped subjective norms. Some participants' efforts to verify such information also suggest a critical engagement with normative influences.

### **5.3. Participants' Experiences before, during, and after Vlogging**

Participants' vlogging experiences unfolded across three stages. In the pre-vlogging phase, barriers such as habitat access, personal issues, weather, cost, and transportation weakened perceived behavioural control—consistent with Dabaja's (2024) findings on outdoor activity constraints. Conversely, adequate planning and environmental suitability enhanced perceived control. While a positive attitude toward nature served as a key motivator, it was insufficient alone to generate strong behavioural intention when barriers were high. Within the TPB framework (Ajzen, 1991), these results underscore that supportive conditions sustaining high perceived behavioural control are at least as critical as positive attitudes in shaping actual behaviour.

During vlogging, participants experienced physiological responses such as shyness, stress, voice trembling, and excitement, which hindered tasks like searching for information, using programs, and conducting research. These difficulties reflect technostress (Brod, 1984), arising from low perceived behavioural control over technology use. As Cazan and Maican (2023) highlight, high technological self-efficacy is key to coping with such stress. Although personal values like prudence, patience, perfectionism, and love of nature motivated participation, factors including privacy concerns, performance anxiety, and time management difficulties negatively shaped attitudes toward vlogging (Fidan & Debbag, 2018; Stoszkowski, 2018). Regarding subjective norms, while some participants sought social support, prevalent anxiety, shyness, and lack of motivation suggest that vlogging has not yet become an established norm within their social circles. Overall, low perceived behavioural control, negative attitudes fuelled by performance fears, and weak subjective norms collectively impeded the vlogging process.

Participants' positive outcomes—such as performance satisfaction, lasting memory, and shared experience—reinforced favourable attitudes toward future vlogging engagement. These findings align with studies by Aldukhayel (2021) and Xie et al. (2021), which highlight the motivating and educational value of vlogging in language learning contexts. However, perceptions of self-criticism, low performance, inexperience, and the characterization of the process as challenging suggest that perceived behavioural control remains tenuous. This fragility echoes obstacles identified by Xie et al. (2021), including time demands, technical difficulties, and unfamiliarity with the medium. Overall, participants' future behavioural intentions appear shaped by an ongoing interaction between experience-driven positive attitudes and varying levels of perceived control.

### **5.4. Effects of Vlog Creation on Professional Development**

Vlog performances contributed to participants' professional learning, internal development, and nature literacy. Authentic learning experiences—such as on-site learning, learning by doing, and trial and error—fostered a strong belief in the pedagogical value of the process, positively shaping attitudes. Additionally, experiences involving research skills, problem-solving, and resilience through risk-taking enhanced participants' self-confidence in managing outdoor activities and integrating technology. This increase in perceived behavioural control strengthened their intentions toward future practices (Ajzen, 1991). Consistent with these findings, Rochimah et al. (2025) and Aktepe et al. (2025) have also shown that technology-supported projects enhance authentic competencies. Overall, these professional and personal gains reinforced both positive attitudes and perceived control, significantly nurturing participants' intention to adopt teaching approaches that integrate technology with nature.

Participants demonstrated notable development in technology self-efficacy, particularly in video capturing and editing, social media engagement, and technology-mediated presentation and

communication skills. These gains indicate improved perceived behavioural control over vlog practices. Consistent with Fidan and Debbag (2018), our findings confirm that vlogging enhances digital media and communication competencies. What initially posed a barrier—low self-efficacy—was transformed into a facilitator through hands-on experience. This increased perceived control is likely to strengthen participants' intentions to adopt and sustain similar technology-integrated teaching practices in the future.

Participants advanced their professional knowledge in conceptual and factual domains through nature vlogging. Supporting these findings, Fidan and Debbag (2018) reported that vlogs enhance reflective learning, self-regulation, self-expression, communication, and critical thinking. From a TPB perspective, three inferences emerge: (1) These competencies may increase perceived behavioural control by reinforcing participants' confidence in designing technology-supported authentic tasks. (2) Higher-order thinking skills such as critical thinking and self-regulation may positively shape attitudes toward such practices. (3) Outcomes like communication and knowledge sharing may strengthen subjective norms through peer feedback. Overall, the professional development gained through vlogging supported participants' intentions to adopt and sustain this innovative pedagogical approach in the future.

Nature-based practices fostered significant internal developments in participants, including curiosity, creativity, and psychological well-being. These affective outcomes align with McMichael's (2023) emphasis on sensory exploration and creativity, and Garden's (2023) notion of gently provoking curiosity through authentic nature engagement. Such internal gains shaped positive attitudes toward vlogging, leading participants to perceive the activity as enjoyable, meaningful, and personally satisfying. Additionally, the emergence of self-development awareness and a sense of specialization reflect Harwood et al.'s (2022) findings that creativity with natural materials in unstructured tasks reinforces self-confidence. In turn, these developments strengthened participants' perceived behavioural control by enhancing confidence in their performance. Overall, the internal and emotional gains cultivated through nature-based vlogging positively influenced both attitudes and self-efficacy beliefs.

Nature-based vlogging enhanced participants' attention and discovery skills—such as observation, environmental awareness, and perspective-taking—alongside their integration with nature, including emotional bonding and interaction with phenomena. These gains strengthened participants' perceived behavioural control by reinforcing their confidence in identifying scientific phenomena and producing vlogs in natural settings. Moreover, the emergence of emotional bonding—consistent with Smith's (2002) concept of "sense of place" and Sobel's (2008) notion of "developing close affiliations"—positively shaped participants' attitudes toward vlogging practices.

Third, vlog practices enhanced participants' environmental awareness and sense of responsibility, contributing to a subjective norm that supports pro-environmental behaviour. This finding aligns with Kahrman-Pamuk (2020), who reported that nature activities foster similar outcomes in preschool children from parents' perspectives. Both studies suggest that individuals internalize environmental values in ways that align with the expectations of their social environment.

## 6. Suggestions

Based on the findings of this phenomenological study, which investigated participants' processes of discovering natural phenomena and documenting them through vlogs, three comprehensive recommendations are presented below.

Participants faced pre-shooting difficulties related to feelings of inadequacy, environmental conditions, habitat access, and weather. To support more effective practice, it is recommended to organize guided trips to local natural areas (e.g., forests, water resources, national parks) to enhance environmental awareness. During these trips, demonstrations and explanations should illustrate potential scientific clues and discovery strategies. Such preparatory experiences are expected to strengthen participants' perceived behavioural control and positive attitudes toward

nature, thereby increasing their intention to explore and document natural phenomena. This, in turn, may improve both their access to natural settings and the quality of their engagement with environmental clues.

Most participants encountered nature-based vlogging for the first time and initially felt novice and unmotivated. Following the practice, however, they expressed satisfaction with their performance and reported positive attitudes toward both the activity and nature. These outcomes highlight gains in key areas such as integration with nature and technology-enhanced teaching. Accordingly, similar practices should be integrated into curricular and extracurricular activities – including nature education projects and performance tasks – for middle and high school students. Such experiences can support nature literacy among students who are increasingly disconnected from the natural world.

Discovering natural clues and representing them through vlogs enhanced participants' authentic learning competencies, technology self-efficacy, professional knowledge, nature integration, and internal development. Given that participants were 2nd–4th year undergraduates encountering such tasks for the first time, integrating authentic, technology-rich activities earlier – starting from the first year – is recommended. Early exposure to instructional technologies and authentic practice would build foundational self-efficacy, strengthening perceived behavioural control and enabling more effective engagement with tools like vlogs in subsequent tasks.

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**Data availability:** The data that support the findings of this study are available from the corresponding author upon reasonable request.

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**Appendix 1. What clues are there in the colors of the rainbow?****Turkish version**

*“Bir dahaki gökkuşağını gördüğünüzde, renklerini dikkatle inceleyin. Kırmızı, turuncu, sarı, yeşil, mavi, lacivert ve mor bantlarının iç halkadan dışarı doğru eşit şekilde serildiğini görebilirsiniz (Roy G. Biv). Ya da göremezsiniz. Gökyüzünde gördüğümüz her renk, beyaz güneş ışığının parçacıklar tarafından eğilmesi, yansıtılması veya dağıtılması sonucunda oluşur, biz de bu parçacıklar hakkında bir şeyler öğrenme şansı buluruz. Bu durumda parçacıklar yağmur damlalarıdır ve gördüğümüz renkler yağmur damlalarının büyüklüğüne dair ipuçlarıdır. Bir gökkuşağında renkler ne kadar silikleşirse, yağmur damlaları o kadar küçük demektir, ancak isterseniz bu konuda daha derine inebilme şansınız vardır. Gökkuşağında:*

*Net bir kırmızı bant ve çok parlak mor ve yeşil bantlar varsa ama çok az mavi VEYA yayın üst kısmı daha az parlak görünüyorsa, yağmur damlalarının çapı 1 mm'den büyük,*

*Kırmızı, renk açısından belirgin derecede zayıf ama hâlâ görünebiliyorsa, orta boyutta yağmur damlaları,*

*Kuşak solgun, mor görülebilen tek parlak renkse, belirgin bir beyaz bant görebiliyorsanız veya kırmızı kaybolmuşsa küçük yağmur damlaları var demektir.*

*Bu kadar ayrıntıyı hatırlamak biraz zor olabilir, bu nedenle hatırlamanız gereken en basit şey, gördüğünüz kırmızı ile yağmur damlalarının doğru orantılı olmasıdır. Diğer bir deyişle: “Ne kadar çok kırmızı, o kadar ıslak bir saç demektir!”*

**English version**

*The next time you see a rainbow, observe its colors carefully. You might see bands of red, orange, yellow, green, blue, indigo, and violet spread evenly from the inner arc outward (Roy G. Biv). Or perhaps you won't. Every color we see in the sky is formed as white sunlight is bent, reflected, or scattered by particles, giving us a chance to learn something about those particles. In this case, the particles are raindrops, and the colors we see are clues to the size of those raindrops. The fainter the colors in a rainbow, the smaller the raindrops, but you have the opportunity to delve deeper if you wish. In a rainbow:*

*If there is a distinct red band and very bright violet and green bands, but very little blue, OR if the top part of the arc appears less bright, the raindrops are larger than 1 mm in diameter.*

*If red is significantly weak in color but still visible, the raindrops are medium-sized.*

*If the band is pale, violet is the only bright color visible, you can see a distinct white band, or red has disappeared, the raindrops are small.*

*Remembering all these details might be a bit difficult, so the simplest thing to keep in mind is that the red you see is directly proportional to the size of the raindrops. In other words: "The more red, the wetter the head!"*

## Appendix 2. Vlog Performance Principles

This performance aims to help you understand the scientific events, principles, and phenomena hidden in nature, and to discover and document the clues that nature offers to science and humanity through a Vlog (Video Blog) project.

A Vlog is a form of video blog that has evolved from traditional written online diaries, created by individuals or teams who document themselves or particular events through video.

When creating your Video Blog for this performance, it is recommended that you consider the following points:

- Your video log may feature one or more natural phenomena as its subject.
- For preliminary information about the phenomenon, you may refer to the book *The Lost Art of Reading Nature's Signs*.
- Alternatively, the phenomenon you choose may be based on information obtained from other sources.
- Once you have identified the phenomenon, the next step is to go out into nature and locate a place where you can directly observe the relevant phenomenon.
- Record the phenomenon you observe in nature using the rear camera of your phone.
- The video should focus solely on documenting the phenomenon; it is not necessary for you to appear in it.
- While recording the phenomenon, you must include verbal explanations regarding it.
- Furthermore, brief written annotations should also be incorporated into the video.
- Depending on the scope of the phenomenon, your Vlog should be between 5 and 10 minutes long.
- You may utilize the applications listed in the link provided below for creating your video logs:  
<https://sosyalmedya.co/video-mobil-uygulama/>
- Finally, please ensure that the Vlog you create focuses on a phenomenon observable in Uşak.

## Appendix 3. Semi-Structured Interview Questions for "Preservice Teachers' Video Blog (Vlog) Experiences in the Quest for Nature's Signs"

Name Surname:

Student ID:

Vlog Location / Area / Province:

The phenomenon, event, or phenomena you observed in the vlog (Please list them item by item)

- ❖ .....
- ❖ .....
- ❖ .....

Please read the questions below and sincerely express your thoughts in a way that reflects your experience. Thank you very much.

1. How did you feel when you were given this task? What were your initial feelings and thoughts?
2. How did you decide on the phenomenon you filmed in your vlog? Why did you choose this phenomenon(event)? Who did you consult or where did you seek help during the decision-making process?
3. Have you ever filmed a vlog before? If your answer is yes, did your previous experience with vlog filming contribute to completing this task? How?
4. What was the experience of filming a vlog about searching for nature's signs like? (What did you feel? What did you experience? Were there any challenges? If so, what were they? If you encountered difficulties, how did you resolve them?) Could you please describe it?
5. What contributions (knowledge, feelings, attitudes, and skills) did being in nature, discovering the clues it offers us, and recording these clues in the form of a vlog provide you?
6. Are there any aspects you wish had been included in this task? If so, what are they?