

Evaluation of the ‘Pocket Plant Guide’ to Support Learning about Plants in Vegetation Succession

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Abstract: The purpose of this study was to investigate the ‘Pocket Plant Guide’ qualitatively through interviews. We allowed Japanese sixth-grade elementary school students to use the ‘Pocket Plant Guide’ in order to identify and observe plants. We interviewed the students to investigate their subjective impressions of using this guide. The results indicated that this guide was effective in supporting the identification and observation of indicator plants.

Keywords: mobile systems, outdoor learning, science learning

1. Introduction

When learning about plants, it is important for students to go outdoors in order to identify and observe them, but it can be difficult to use a written plant guide when they are outdoors. In recent years, it has become apparent that mobile systems can effectively support this kind of activity (Huang, Lin, & Cheng, 2010). We thus developed a mobile system called the ‘Pocket Plant Guide’ to support the identification and observation of indicator plants of vegetation succession (Muratsu et al., 2013). The purpose of this study was to investigate the ‘Pocket Plant Guide’ qualitatively through interviews, in order to clarify its effectiveness in supporting students’ identification and observation of plants.

2. Outline of the ‘Pocket Plant Guide’

The ‘Pocket Plant Guide’ is a system designed to present information on 12 species of indicator plants using an iPhone/iPod Touch platform. Figure 1 shows the home screen of the ‘Pocket Plant Guide’. Flicking the home screen to the left reveals the remaining 6 types of indicator plants also shown as icons. The important feature of our guide is its use of plant sketches instead of the photographs, which have been used in previous systems (e.g., Huang et al., 2010). Scientists alter the

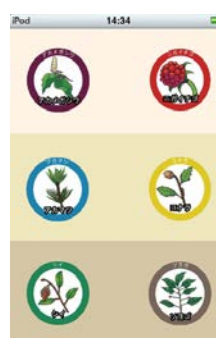


Figure 1:
Home Screen



Figure 2:
Image of Sketch

natural world in some way to facilitate the observation of subjects (Lynch, 1990). Sketches have been used more than photographs to identify and observe plants because plant characteristics can be more visible in a sketch (Figure 2). This guide includes three functions: the first is a color display of the characteristic parts. This function helps to identify indicator plants that have distinct leaf or fruit colour features; the second is a function that enlarges the leaves and fruits. This feature was included to support the identification and observation of indicator plants that have characteristic leaf shapes or leaf veins; the third is a display of the backside of the leaves. This feature may be used to identify and observe characteristic leaf shapes and vein structures on the backside of indicator plants.

3. Evaluation of the ‘Pocket Plant Guide’

3.1 Evaluation Method

The subjects comprised 17 Japanese sixth-grade elementary school students (aged 11–12 years). The evaluation task was to investigate the students’ subjective impressions of using the ‘Pocket Plant Guide’ based on individual interviews. This investigation was carried out on November 17, 2012. The students, who were divided into groups of six, took part in an activity to identify and observe 12 species of indicator plants included in the guide. The students were each provided with a guide. The activity time was approximately 20 min. After this activity, the students were interviewed about using the guide. The duration of the interviews was approximately 5 minutes per person.

3.2 Results

Based on the interview records, we created categories for classifying the students’ statement and then counted the number of student responses for each category (Table 1). The most common category was “I liked the color display of the characteristic parts of the plant,” with 12 students, followed by “It was good that I could see the backside of the leaf,” with 10 students. Table 2 shows the statements of Subject 1 regarding the support for identifying plants provided by the color display of the characteristic parts and the display of the backside of the leaves. Subject 1 had difficulty in identifying the *Rubus microphyllus* as the front side of its leaf was a similar shape to that of another plant. However, by using these functions, Subject1 was able to confirm the white color of the backside of the leaf and thereby identify it. The third most common category was “It was good that I could enlarge the plant’s leaf,” with 9 students. Table 3 highlights the statements of Subject 2 regarding the function that enlarges the leaves. Subject 2 stated that this function facilitated the observation of plant features that would otherwise not have been noticeable without the guide. The fourth most common category was “After looking at the sketches, I wanted to confirm what I had learnt by observing the actual plant,” with 5 students. Table 4 shows the responses of Subject 3 on how the ‘Pocket Plant Guide’ enhanced engagement in identifying and observing plants.

Table 1: Number of students responding to each category.

Category	No. of students
I liked the color display of the characteristic parts of the plant.	12
It was good that I could see the backside of the leaf.	10
It was good that I could enlarge the plant’s leaf.	9
After looking at the sketches, I wanted to confirm what I had learnt by observing the actual plant.	5

N = 17, includes multiple answers.

Table 2: Statement relating to the support for identifying plants provided by the color display of the characteristic parts and the display of the backside of the leaves.

I:	Please tell us what you liked about the ‘Pocket Plant Guide’.
S1:	I could see both the front and back of the leaf.
I:	For example, on which plant did you notice this?
S1:	<i>Rubus microphyllus</i> . I couldn’t identify it because the front of the leaf was the same as that of another plant. So I looked at the back of the leaf and I was able to work out it was a <i>Rubus microphyllus</i> .

I: Interviewer , S1: Subject 1

Table 3: Statement relating to the support for observing plants provided by the function that enlarges the leaves.

I:	Please tell us what you liked about the ‘Pocket Plant Guide’.
S2:	I thought the explanation of the Rhododendron was good. Three leaves grew out of the tip of the branch, and the back of the leaf looks white colored. The guide showed that not only did the leaf have hairs, but also described points that you wouldn’t notice just by looking.

I: Interviewer , S2: Subject 2

Table 4: Statement relating to a student’s enhanced engagement when identifying and observing plants.

I:	Please tell us what you liked about the ‘Pocket Plant Guide’.
S3:	[Omission] For example, for the Mallotus plant, it showed us its characteristics in color and by using the enlarging function. I think that having these sorts of functions completely changed the way I understood the plant and made it a lot more enjoyable. I really liked these functions as I think they made it more enjoyable for me later when we were looking at the actual plants.

I: Interviewer , S3: Subject 3

4. Conclusion

The results of the evaluation show that many of the students found the guide useful when identifying and observing the plants. Based on these results, it can be concluded that the ‘Pocket Plant Guide’ is effective in supporting the identification and observation of plants, and moreover, that it produced a certain level of benefits in terms of enhancing students’ engagement.

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