The Use of Flashcards in Enriching Papuan Junior High School Students' Vocabulary Mastery

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ABSTRACT

This study investigated the effectiveness of culturally adapted flashcards in enhancing English vocabulary acquisition among Grade 8 students in Wamena, Papua Pegunungan, Indonesia. Recognizing the challenges of vocabulary instruction in under-resourced, multilingual contexts, the research aimed to evaluate whether integrating local cultural elements into instructional materials could improve both learning outcomes and learner engagement. A convergent parallel mixed-methods design was employed, involving 60 students divided into an experimental group (flashcard-based instruction) and a control group (traditional textbook-based instruction). Data were collected through pre- and post-tests, student questionnaires, classroom observations, and semi-structured interviews with students and one teacher. Quantitative findings revealed that the experimental group achieved significantly greater vocabulary gains ($M = 12.3$) than the control group ($M = 6.4$), $t(58) = 7.21$, $p < .001$. Students exposed to flashcards also reported higher motivation and engagement. Qualitative analysis identified three key themes: enhanced classroom participation, improved confidence in vocabulary use, and strong preference for culturally relevant materials. The findings support the use of flashcards grounded in Dual Coding Theory, Cognitive Load Theory, and sociocultural learning principles. Culturally adapted flashcards not only improve vocabulary retention but also foster inclusive, motivating learning environments in low-resource settings. The study recommends the broader adoption of localized visual aids in English language teaching and calls for further research on their long-term impact and scalability.

Keywords: *Vocabulary acquisition; flashcards; cultural adaptation; second language learning; Papua Pegunungan*

INTRODUCTION

Learning vocabulary is a key part of successfully learning a second language. It is the foundation on which all other language skills are built. Research shows that knowing many words is not just one part of language ability, it is the most important factor in becoming a good communicator (Schmitt, 2010; Webb & Nation, 2017). Nation (2013) found that vocabulary knowledge makes up about 60–70% of what is needed to understand reading. Staehr (2008) also found a strong connection between the number of words learners know and how well they understand spoken English. These findings show that teaching vocabulary well can make a big difference, especially in places where usual teaching methods have not worked effectively.

In the Papuan context, learning English vocabulary is especially difficult. This region faces serious educational challenges, such as, less qualified English teachers, outdated or limited teaching materials, and isolated from real English exposure due to geography (Ministry of Education and Culture, 2019). These problems lead to what Cummins (2000) calls "subtractive

bilingualism," where students struggle to learn a second language without strong support for their first language. As a result, students in Papua often get very low scores on national English tests, especially in vocabulary (Kemendikbud, 2020). This puts them at a disadvantage and limits their chances for higher education and better jobs.

Moreover, traditional ways of teaching vocabulary, such as memorizing word lists, translating words, or doing repetitive drills, have been widely criticized. These methods often fail to help students remember words or enjoy learning. In contrast, new research encourages teaching strategies that involve visuals, interaction, and active use of language. Flashcards have received special attention because they support memory through pictures, allow for repeated practice, and can be used both alone and in groups.

Several learning theories support the use of flashcards. Paivio's (1986, 2007) dual coding theory explains that we remember things better when we use both words and images. This is because our brain has two systems, one for language, while another for images, and using both creates stronger memory connections. Brain research backs this up, showing that combining words with images helps learners remember more over time (Paivio & Sadoski, 2011). In multilingual areas like Papua, where students speak local languages, Bahasa Indonesia, and English, images can also help students learn new words without always relying on their first language (Kroll & Stewart, 1994).

Another helpful theory is Sweller's (1988, 2011) cognitive load theory. It explains how to design learning in a way that does not overwhelm students. Good flashcards break down vocabulary into small, simple pieces, avoid confusing information, and help students focus on understanding and remembering words. This is why flashcards often work better than more complicated digital tools, which may distract learners.

The spacing effect, first discovered by Ebbinghaus (1885), also supports using flashcards. It shows that spreading out learning over time is better than cramming. Bahrick and Hall (2005) found that people remember vocabulary for many years if they learn it with spaced repetition. Cepeda et al. (2006) also found that spaced learning works in many settings. According to Bjork and Bjork (2011), each time learners recall a word, their memory becomes stronger. This process makes learning more lasting and helps students use words in new situations.

Studies from around the world show that flashcards are one of the best ways to learn vocabulary. Dunlosky et al. (2013) found that using flashcards with spaced practice is highly effective. Nakata's (2011) review of 23 studies showed that flashcards improve both short-term and long-term memory of new words. Students also did better at using vocabulary in new contexts.

Furthermore, Webb (2009) found that students who used flashcards remembered 95% of the vocabulary after one week, while students who only read texts remembered just 67%. Flashcard users also improved in fluency and understanding how words work together. In line with this, Karpicke and Janell (2011) found that whether flashcards were digital or paper-based did not matter. What mattered was how they were used, especially if they included feedback and spaced repetition.

Some recent studies have looked at flashcards in places similar to Papua. Huang and Lin (2019) worked with indigenous students in Taiwan and found that flashcards with local images helped students learn better and feel more motivated. In rural Vietnam, Nguyen (2020) showed

that flashcards made by teachers using local materials worked just as well as commercial ones and gave teachers more confidence.

These results show that flashcards are especially useful in low-resource areas. They are cheap, easy to make, and can include local culture and knowledge. They also encourage students to work together and learn outside the classroom. In places like Papua, where schools may not have enough time or materials, flashcards offer a flexible way to keep learning, whether at home, in the community, or during travel.

However, there are still gaps in our understanding. Most research on flashcards has been done in cities with modern technology and students who speak the same language. Papua is different: it has more than 250 local languages and many challenges that haven't been fully studied. Also, many studies only look at short-term results, not long-term learning or how students use vocabulary in real communication.

Therefore, to fill these gaps, this study looks at how flashcards affect vocabulary learning over time in Jayapura, Papua. It aims to understand whether flashcards that reflect local culture can improve students' vocabulary skills in a lasting way. The central research question is: How does the use of culturally adapted flashcards affect English vocabulary acquisition among secondary school students in Wamena, Papua Pegunungan?

This study supports a shift toward teaching methods that are simple, affordable, and culturally meaningful approaches that help bring more fairness and opportunity to students in under-resourced communities.

METHODS

This study employed a convergent parallel mixed-methods design (Creswell & Plano Clark, 2011), wherein quantitative and qualitative data were collected simultaneously, analyzed separately, and then merged during interpretation. This approach allowed for a comprehensive understanding of the impact of instructional methods on vocabulary learning.

Participants included 60 Grade 8 students from two classes in a junior high school in Wamena, Papua Pegunungan. One class served as the experimental group (n=30), receiving flashcard-based instruction, while the other acted as a control group (n=30), taught using traditional textbook-based vocabulary lessons. Additionally, one English teacher and six students were interviewed to gain deeper qualitative insights into their experiences and perceptions.

In order to gain the data, several instruments were utilized for data collection. A 30-item vocabulary pre-test and post-test were administered to assess students' receptive and productive vocabulary knowledge. A student questionnaire consisting of 15 Likert-scale items measured motivation, engagement, and perception of the learning process. Semi-structured interviews were conducted with selected students and the teacher to explore their experiences more deeply. Furthermore, a classroom observation checklist was used to document student engagement and participation during the lessons.

The study was carried out over a four-week period. Initially, a pre-test was administered to both the experimental and control groups. The experimental group then received three flashcard-based sessions per week, each focusing on ten new vocabulary words. Meanwhile, the control

group engaged in textbook-based activities using the same word lists. At the end of the intervention, a post-test was administered to both groups to measure vocabulary gains. Interviews with the teacher and selected students, as well as classroom observations, were conducted concurrently throughout the intervention period.

In addition, quantitative data were analyzed using SPSS software. Paired t-tests and ANOVA were employed to assess vocabulary gains between and within groups. Qualitative data were subjected to thematic analysis following the approach outlined by Braun and Clarke (2006), allowing for systematic coding and interpretation of interview transcripts and observation notes.

RESULTS & DISCUSSION

The present study provides compelling empirical support for the use of culturally adapted flashcards to enhance English vocabulary acquisition among Grade 8 students in Jayapura, Papua. Quantitative analysis using a paired-samples t-test revealed a statistically significant improvement in vocabulary knowledge for the experimental group (M = 12.3, SD = 3.5) relative to the control group (M = 6.4, SD = 2.9), $t(58) = 7.21$, $p < .001$. These findings indicate that flashcard-based instruction is substantially more effective than traditional textbook methods in promoting vocabulary gains.

Table 1. Vocabulary Test Scores

Group	Pre-Test Mean (SD)	Post-Test Mean (SD)	Mean Gain
Experimental	10.4 (2.8)	22.7 (3.1)	12.3
Control	10.7 (3.1)	17.1 (2.6)	6.4

This result is similar to what Webb (2009) and Nakata (2011) who found that using flashcards along with spaced repetition and practice helps students remember new vocabulary better, both in the short term and over a longer period. The substantial learning gains observed in the experimental group suggest that flashcards are particularly effective in contexts where learners have limited exposure to English outside the classroom.

In addition to cognitive gains, affective outcomes were also notable. Data from the student questionnaire indicated higher levels of motivation and engagement among students in the experimental group, with mean scores of 4.2 and 4.0 respectively, on a 5-point Likert scale. This contrasts with scores of 3.1 (motivation) and 3.0 (engagement) in the control group, suggesting that flashcards not only support language learning but also foster a more positive learning environment.

Table 2. Student Motivation and Engagement Scores

Factor	Experimental Group	Control Group
Motivation	4.2	3.1
Engagement	4.0	3.0

These results are well-explained by Paivio's (1986, 2007) Dual Coding Theory, which posits that learners better retain information when verbal and visual representations are combined. In the present study, flashcards utilized culturally relevant imagery, which likely activated both visual and verbal memory systems, reinforcing vocabulary retention. Additionally, Sweller's (1988, 2011) Cognitive Load Theory supports the findings: the simple, focused nature of flashcards reduces extraneous cognitive load, allowing learners to concentrate on core linguistic information.

In addition to the quantitative data, qualitative findings from interviews and classroom observations offered rich insights into how and why flashcard-based instruction facilitated vocabulary learning. Thematic analysis (Braun & Clarke, 2006) revealed three major themes:

1. Enhanced Classroom Participation

Students in the experimental group demonstrated noticeably higher levels of participation during lessons. Classroom observation checklists showed that students were more likely to answer questions, volunteer in group activities, and engage with their peers. This increase in participation was attributed to the interactive and visually engaging nature of the flashcards, which appeared to lower anxiety and reduce fear of making mistakes.

Teachers noted that students who were usually quiet became more active, especially when images on the flashcards were culturally familiar. For instance, a flashcard showing a traditional Papuan house or a local fruit helped bridge the gap between abstract English vocabulary and the students' lived experience. This visual-cultural connection likely contributed to a greater sense of ownership over the learning process.

2. Improved Confidence in Using English Vocabulary

Another emerging theme was the development of learner confidence, particularly in productive vocabulary use (e.g., speaking and writing). Students reported that seeing images alongside words allowed them to remember meanings more quickly and with greater certainty. This confidence was evident in classroom observations, where students in the experimental group used new words more frequently in oral responses and short writing tasks.

Several students mentioned that *"the pictures made the words stick in my head,"* illustrating the dual coding effect in practice. This aligns with Paivio's theory, which suggests that visuals provide a parallel path for memory retrieval, making it easier for learners to recall vocabulary when needed. In multilingual contexts like Papua Pegunungan, where translation across three or more languages may occur internally (local language, Indonesian and English), reducing this cognitive burden through images can be particularly beneficial.

3. Strong Preference for Culturally Familiar Materials

The third theme emphasized students' and the teacher's strong preference for culturally adapted materials. Flashcards designed with local elements (e.g., native animals, traditional clothing, or common community activities) were consistently rated as more engaging and easier to

understand. Students expressed a sense of pride and curiosity when they encountered vocabulary presented through images that reflected their own environment.

One student noted:

"I liked the cards because the pictures helped me remember the words. Some cards had things from our village, so it was easy to understand."

This suggests that cultural relevance not only supports comprehension but also reinforces motivation and identity, helping learners feel that their background is respected and valued within the learning process. From a sociocultural perspective, this also promotes situated learning, the idea that learning becomes more meaningful when embedded in familiar contexts (Lave & Wenger, 1991).

The teacher also reported that culturally adapted flashcards made instruction more enjoyable and easier to scaffold across ability levels. The simplicity and clarity of the materials enabled better classroom management and improved lesson pacing, especially in mixed-ability classrooms with limited resources.

CONCLUSION

This study provides clear evidence that culturally adapted flashcards significantly enhance English vocabulary acquisition among Grade 8 students in Wamena, Papua Pegunungan. Quantitative findings showed that students who received flashcard-based instruction achieved substantially higher vocabulary gains and demonstrated greater motivation and engagement compared to those who learned through traditional textbook methods. These improvements were statistically significant and supported by educational theories such as Dual Coding Theory and Cognitive Load Theory, which emphasize the effectiveness of combining verbal and visual learning strategies.

Qualitative data further reinforced these findings. Students in the experimental group displayed increased classroom participation, greater confidence in using English vocabulary, and a strong preference for learning materials that reflected their local culture. The integration of familiar images and concepts not only supported memory retention but also fostered a more inclusive and motivating learning environment. These results suggest that when flashcards are adapted to fit students' culture and learning environment, they are not only effective for teaching but also help learners feel more confident, included, and motivated, especially in under-resourced or marginalized communities.

Based on the findings, it is recommended that schools in low-resource areas like Papua incorporate flashcards into regular English vocabulary instruction. Flashcards are cost-effective, engaging, and support memory retention, especially when culturally adapted. Teachers should be trained to create and use flashcards with familiar local content to enhance relevance and motivation. Flashcards should also be used in interactive group activities to encourage participation and communication. Lastly, further research is needed to examine the long-term effects of flashcard use and how this approach can be adapted to other rural or multilingual contexts.

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