UNIVERSITY OF TARTU
DEPARTMENT OF ENGLISH STUDIES

THE EFFECT OF LEARNER-GENERATED DRAWINGS VERSUS PRE-MADE ILLUSTRATIONS ON VOCABULARY RETENTION IN ADULT BEGINNER EFL LEARNERS

MA thesis

Karoliina Anett Kompus
SUPERVISOR: ***Assoc. Prof.*** **Jane Padrik**

TARTU
2026

ABSTRACT

This thesis investigates the effect of learner-generated drawings compared to pre-made illustrations on immediate and delayed vocabulary retention in adult beginner learners of English as a foreign language. It is divided into a literature review, a methodology and results section, and a discussion. The literature review presents key theories of vocabulary learning and visual support. The methodology chapter describes a within-subjects experiment involving ten participants, as well as results from pre-, immediate, and delayed recall tests, and questionnaire data. The results of the study indicate that participants performed better in the illustration condition in the immediate post-test, whereas the difference between the two conditions was minimal in the delayed post-test due to a greater decline in the illustration condition. These findings seem to suggest that while pre-made illustrations may support more effective initial learning, learner-generated drawing may contribute to relatively more stable retention over time. Questionnaire responses further revealed mixed attitudes towards drawing, highlighting the role of individual differences in its effectiveness. The discussion chapter of the thesis interprets these findings and considers their pedagogical implications.

Keywords: vocabulary learning, EFL, drawing, visual aids, memory.

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

EFL – English as a foreign language

DCT – Dual Coding Theory

CTML – Cognitive Theory of Multimedia Learning

CLT – Cognitive Load Theory

INTRODUCTION

Learning vocabulary is one of the central tasks in language acquisition. Words form the foundation through which meaning is expressed and understood, making lexical knowledge an essential tool for communication. Without an adequate vocabulary store, it is incredibly difficult to participate in conversations, understand written texts, or express thoughts clearly. As such, vocabulary development has long been recognised as one of the vital components of successful language learning. Research has consistently emphasised that vocabulary knowledge plays a crucial role in communicative competence (Alqahtani 2015). Furthermore, insufficient vocabulary has been identified as one of the main obstacles for language learners, especially in reading comprehension and overall language use (Laufer 1997).

However, despite its importance, acquiring new vocabulary can be a challenging process, especially for learners with limited exposure to the target language. Vocabulary learning involves not only memorising word forms, but also understanding their meanings and being able to use them appropriately in different contexts (Ma 2009: 27). As a result, retaining and later retrieving newly learned words can be difficult. For this reason, identifying effective strategies that support vocabulary acquisition continues to be an important goal in language education research.

One widely used approach involves the use of visual materials to support learning. Images, diagrams, and other visuals are frequently used to accompany verbal input, helping learners understand and remember new information. These materials may clarify meaning, reduce ambiguity, and support memory through visual representations. Their effectiveness has been explained through several cognitive theories, which are discussed in detail later in this thesis.

More recently, however, attention has shifted from passively viewing visuals to more active approaches involving learner participation. In addition to teacher-provided images (referred to in this thesis as pre-made illustrations), learners may also generate their own visual representations. One example of this is learner-generated drawing, which refers to the creation of simple representational drawings by learners. Unlike pre-made illustrations, which are viewed and interpreted, drawing requires learners to actively transform verbal information into a visual form. This study builds on the distinction between the two by experimentally comparing these approaches. Participants learn a set of new English vocabulary under different conditions, either by creating their own drawings or by studying pre-made illustrations. Vocabulary retention is then measured through both immediate and delayed recall tests in order to examine how well the words are remembered over time.

Drawing has attracted increasing attention as a potential learning strategy. Previous research (e.g. Meade et al 2018; Wammes et al 2016; Wammes et al 2018) suggests that creating drawings can improve memory for new information compared to more passive methods. This effect is often attributed to deeper cognitive processing, as learners must first visualise the concept and then actively represent it visually on paper. As a result, drawing has been suggested to support more durable memory traces.

However, despite these promising findings, research on drawing as a learning strategy is relatively limited, especially with adult learners. Many existing studies focus on children, examine its role in first language learning, or examine drawing in educational contexts other than language learning. Furthermore, drawing is often compared to simple repetition rather than to other visual learning strategies, such as pre-made illustrations. As a result, it is still unclear

whether learner-generated drawing provides advantages over commonly used visual supports in foreign language vocabulary learning.

Therefore, the aim of this study is to compare the effects of learner-generated drawing and pre-made illustrations on vocabulary retention in adult beginner learners of English as a foreign language (EFL). In addition to measuring both immediate and delayed recall, the study also examines learners' perceptions of drawing as a learning strategy in order to better understand how it is viewed from the learner's perspective. More specifically, the study addresses the following research questions:

1) Does learner-generated drawing result in higher immediate and delayed recall of foreign language vocabulary compared to learning with pre-made illustrations?
2) How do adult beginner EFL learners perceive learner-generated drawing as a strategy for vocabulary learning?

Based on previous research suggesting that self-generated material enhances encoding and retention, it is hypothesised that vocabulary learned through learner-generated drawing will result in higher immediate and delayed recall scores than vocabulary learned through pre-made illustrations.

The thesis is divided into an introduction, two main chapters, a discussion chapter, and a conclusion. The first chapter provides a review of the relevant literature on vocabulary learning in foreign language learning, theories explaining the effectiveness of visual aids in education, and drawing as a learning strategy. The second chapter describes the methodology of the study, including the research design, materials, participants, and procedures, as well as the results of the main study. The discussion chapter discusses the findings in relation to previous research and

their implications for vocabulary learning and teaching. Finally, the conclusion summarises the main findings of the study and outlines limitations and suggestions for potential future research.

1. LITERATURE REVIEW

The following chapter provides the theoretical foundation for this thesis by examining key concepts and previous research on vocabulary learning and the use of visuals to support memory. The first section examines vocabulary in foreign language learning by defining what vocabulary is, clarifying what it means to know a word, and outlining its importance for language proficiency. The second subchapter focuses on visual aids in education and how pictorial and multimedia materials can support learners. The third section introduces the main theoretical frameworks that support the use of visuals in learning, including the Dual Coding Theory, the Cognitive Theory of Multimedia Learning, and the Cognitive Load Theory. The final part of the literature review explores learner-generated visuals and the drawing effect, including related phenomena that support the idea of using drawing as a learning strategy.

1.1 Vocabulary in Foreign Language Learning

Vocabulary is widely considered a central component of foreign language learning and one of the key building blocks of communicative competence. Without sufficient lexical knowledge, learners struggle both to understand input and to express meaning. Consequently, vocabulary acquisition has received considerable attention in second language research.

Vocabulary is often described as “the words in the language”, though this simple definition does not fully capture its complexity (Ur 2012: 60). Ur notes that many lexical items consist of multi-word expressions that express a single concept and are stored mentally as ‘chunks’. It is, therefore, more accurate to speak of vocabulary items than merely individual words.

Knowing a word involves more than recognising its form. Nation (2001: 26–27) distinguishes between form, meaning, and use, each of which encompasses several components. Form includes spoken, written, and morphological aspects of the word; meaning involves understanding associations and both form-meaning connections and concept-referent relationships; and use includes grammatical functions, collocations, and various constraints on use. This shows that vocabulary knowledge is multi-dimensional and goes beyond simply recognising a word's form.

In addition, vocabulary knowledge can be divided into receptive and productive knowledge. Receptive knowledge refers to the ability to recognise and understand a word while listening or reading, whereas productive knowledge involves the ability to retrieve and accurately use the word in speaking or writing (Schmitt 2000: 4). Furthermore, a distinction is also made between breadth (how many words a learner knows) and depth (how well each word is known) of vocabulary knowledge, the latter of which encompasses much more knowledge of nuance, associations, and collocations (Schmitt 2014: 914). Vocabulary learning is not only about increasing the number of known words (the breadth), but also about developing more flexible knowledge of each item (the depth).

Because vocabulary knowledge is both multi-layered and foundational to communication, it plays a vital role in successful language acquisition, as lexical knowledge is necessary for understanding others and conveying meanings. As Wilkins (1972: 111, emphasis in original) has stated: "/…/ without grammar very little can be conveyed, without vocabulary *nothing* can be conveyed." This highlights the central role of vocabulary, as meaning is primarily constructed and exchanged through words. Later research has consistently supported this view, placing lexical knowledge at the centre of communicative competence (Schmitt 2000; Alqahtani 2015).

In addition to its role in communication, lexical knowledge is also necessary for overall language proficiency across all skills. Nation (2011, as cited in Alqahtani 2015: 22) notes that it plays a vital role in reading, listening, writing, and speaking. Furthermore, research suggests that vocabulary knowledge is a stronger predictor of reading comprehension than grammar (Laufer 1997: 31). This indicates that lexical gaps may hinder understanding more than grammatical inaccuracies.

Given its importance, learners require a considerable number of words to function effectively in the target language. For example, it has been suggested that learners need to understand approximately 95–98% of the words in a text to achieve adequate comprehension (Ur 2012: 63). For this reason, vocabulary is not merely an additional component of language learning, but is rather a prerequisite for successful comprehension and communication.

Despite its importance, vocabulary acquisition presents several challenges. One major difficulty is the large number of lexical items learners must acquire, especially given their limited exposure compared to native speakers (Nation 2001: 9). In addition, learners also often struggle with aspects such as pronunciation, spelling, and especially memorisation, which requires transferring new items into long-term memory (Schmitt 2000: 131; Kaphle 2024: 38). Vocabulary learning is also cognitively demanding. Since knowing a word involves multiple components, learners must process and integrate new information while managing limited cognitive resources. This demands great cognitive effort, resulting in high cognitive load, particularly for beginner learners (Sweller et al 2011: 61). As a result, vocabulary acquisition is often slow and effortful, requiring repeated exposure and effective learning strategies. These challenges highlight the need for effective strategies that support vocabulary learning and retention, such as the use of visual aids, which are discussed in the following section.

1.2 Visual Aids in Education

Visual aids have long been recognised as valuable tools in education, as they make abstract, unfamiliar, and complex information more comprehensible. In line with the broader "pictorial turn", images have shifted from merely illustrative elements to central components of communication and meaning-making (Felten 2008: 1). This shift is also reflected in education, where visuals have consistently been used to support engagement and understanding (Harmer 2007: 178). Thanks to technological development, traditional images have expanded into multimedia formats such as videos and animations, making learning increasingly multimodal. Research suggests that learners achieve deeper understanding when information is presented through both words and pictures rather than through words alone (Mayer 2002: 94). Because of that, visuals have an integral role in instruction.

Visual aids can be defined as materials that convey information through visual modes, either on their own or alongside verbal language. These include all kinds of images, diagrams, charts, and infographics, as well as multimedia resources such as videos and animations (Alabi 2024; Alhazmi 2024). Importantly, visuals are not meant to replace verbal input but rather to complement it, supporting learners in constructing mental representations of new information (Mayer 2002: 85). It is when they are used together with text when they are at their most effective.

A considerable amount of research has been done into the benefits of using visual aids in educational contexts, with particular attention given to their effectiveness in language learning. One key benefit of visual aids is their ability to support comprehension. By providing concrete representations, visuals help learners form mental images of otherwise abstract concepts. Carney and Levin (2002: 9–10) argue that pictures can also direct attention, clarify meaning, and reduce

ambiguity, especially in cognitively demanding texts. This aligns with findings from cognitive research suggesting that a large proportion of information processing is visual in nature, which means that visual input can facilitate more efficient interpretation of new content (Raiyn 2016: 155).

Visual aids also play an important role in managing cognitive load. Vocabulary learning in particular requires learners to process multiple aspects of a word simultaneously, thus placing considerable demands on working memory (Nation 2001; Schmitt 2000). When these demands exceed a learner's cognitive capacity, learning may be hindered (Mayer and Moreno 2003: 45). Visuals can help reduce unnecessary cognitive effort by distributing information across both visual and verbal channels, allowing learners to process information more effectively (Mayer 2002; Sweller et al. 2011). As a result, learners can allocate more cognitive resources to actually understanding and integrating new knowledge.

In addition to supporting comprehension and reducing cognitive load, visual aids can enhance memory and retention. Research has shown that information paired with images is more likely to be remembered than verbal information alone (Pichette 2002: 118). This may be due to the fact that visuals create more distinctive and richer mental representations, thus facilitating encoding and later retrieval (Carney and Levin 2002). By linking verbal information to concrete visual referents, learners are better able to retain and recall new items.

Lastly, visuals aids may also contribute to learner motivation. In foreign language learning, where sustained effort is required, motivation plays an important role in success, as learners with high motivation generally acquire languages more successfully (Krashen 1982: 31). If learning tasks are perceived as too monotonous or demanding, learners may lose motivation, which can lead to lower performance. Visual materials can increase engagement by introducing

variety, breaking up text-heavy instructions, and making learning more appealing (Zeyab 2017: 31; Alhazmi 2024: 391). Although visuals alone do not guarantee motivation, they can still help maintain learners' interest and support continued engagement with learning tasks.

Overall, visual aids play a varied role in learning. They support comprehension, reduce cognitive load, enhance memory, and contribute to motivation. However, their effectiveness largely depends on how they are designed and integrated into learning. Visuals are most beneficial when they complement verbal inputs and align with learners' cognitive processes. Because of this, the following sections will examine the theoretical frameworks that explain how visual and verbal information interact in learning.

1.3 Theoretical Foundations of Learning with Visuals

The previous sections have outlined vocabulary in foreign language learning and the practical benefits of visual aids in educational contexts. However, it is also necessary to consider the theoretical frameworks that explain why visuals can support learning. These theories provide a basis for understanding how they influence comprehension, memory, and cognitive load. This section, therefore, introduces three key frameworks relevant to the present thesis: Dual Coding Theory, the Cognitive Theory of Multimedia Learning, and Cognitive Load Theory. Together, they explain how verbal and visual information are processed, stored, and retrieved, and why combining words with images can support learning and memory.

1.3.1 Dual Coding Theory

One of the most influential frameworks explaining the effectiveness of visual aids is Dual Coding Theory (DCT), proposed by Allan Paivio. This theory assumes that mental

representations are organised into two interconnected systems: a verbal system and a nonverbal system. The verbal system includes linguistic codes such as spoken and written words, while the nonverbal system contains imaginal representations (i.e. mental images and sensory experiences) (Clark and Paivio 1991: 151). Although the two systems function independently, they may also be activated simultaneously, allowing information to be encoded in multiple ways. They are linked through referential connections (e.g. a word evoking an image) and associative connections within each system (for example, the word 'metal' may bring up 'gold', 'lead', and 'iron') (Clark and Paivio 1991: 151–153). An illustrative figure summarising the dual coding model with both of its systems and the connections between them can be seen below (Figure 1).

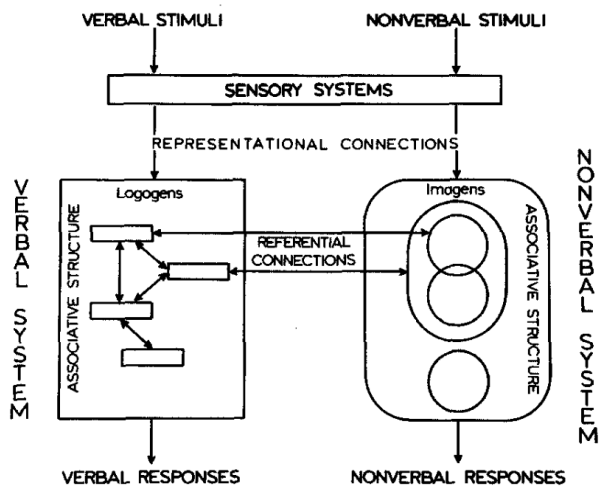


Figure 1. Verbal and nonverbal symbolic systems of Dual Coding Theory (Clark and Paivio 1991: 152)

Research has shown that pictorial information is often remembered better than verbal information alone (Paivio and Csapo 1973). However, DCT does not simply claim that images are superior to words. Rather, it suggests that learning is most effective when information is encoded both verbally and visually, creating two memory traces that can support recall (Alhazmi 2024: 395). Thus, if one trace is forgotten or difficult to retrieve at the moment, then the other

can still support recall. This is especially useful in educational contexts, where visuals that serve a representational function help learners form a verbal and visual representation of new concepts.

In foreign language learning, this dual encoding is especially important for vocabulary acquisition. Learners must connect the form of a word with its meaning in order to "know" it (Schmitt 2014). Presenting a word alongside a visual representation can facilitate this process by supporting both systems. This idea is further reflected in Paivio's (1975) Additivity Hypothesis, which proposes that recall is enhanced when words and images are presented together, as learners benefit from both verbal and nonverbal encoding (Pichette 2002: 118). In other words, according to this hypothesis, the memory advantage does not come simply from the presence of images, but rather from the additive effect of activating multiple representational systems at the same time.

However, applying DCT to foreign language learning does not come without limitations. Pichette (2002) notes that much of the early evidence for additivity comes mainly from first language studies involving concrete and familiar items, which may limit its relevance to beginner EFL learners. Furthermore, relatively few studies have examined the combined use of multiple stimulus types for isolated vocabulary items in classroom settings. This suggests that the effectiveness of combining words and images cannot be assumed uncritically and may depend on factors such as task design, learner engagement, and the extent to which learners process or generate visual representations. These details show the importance of not only encoding information, but also cognitive processing, which is addressed by the following theories: Cognitive Theory of Multimedia Learning and Cognitive Load Theory.

1.3.2 Cognitive Theory of Multimedia Learning

Building on DCT, Richard Mayer's Cognitive Theory of Multimedia Learning (CTML) applies the principles of dual coding and combined processing of verbal and visual information directly to instructional contexts. Mayer (2002: 86, 103) defines multimedia learning as the process of building mental representations from words and pictures. The theory is based on three main assumptions: the dual channel assumption, the limited capacity assumption, and the active processing assumption. An illustrative figure of CTML can be found below (Figure 2).

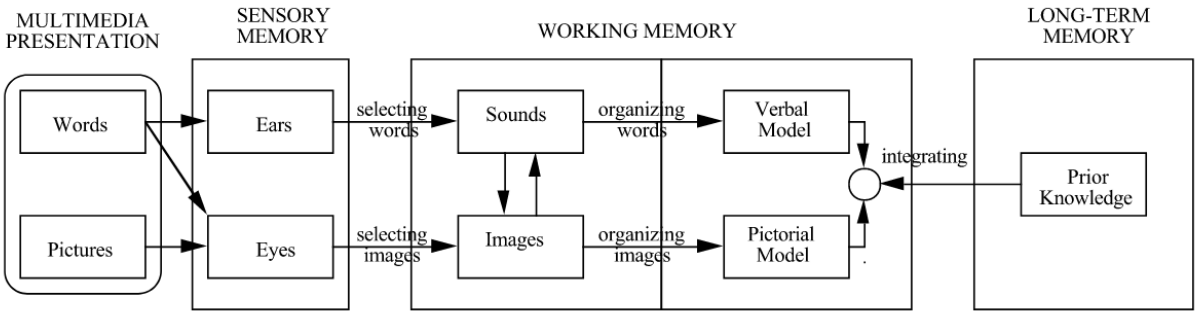


Figure 2. Cognitive Theory of Multimedia Learning (Mayer 2024: 15)

The first of these assumptions, the dual channel assumption, relates back to DCT. It relies on the idea that information is processed through two separate channels: a verbal channel for linguistic input (spoken or written) and a visual one for images and other visual representations. The assumption closely aligns with Paivio's original distinction between verbal and nonverbal systems. However, CTML places greater emphasis on how these channels operate during learning, rather than on long-term memory representations alone.

The limited capacity assumption claims that each cognitive channel has a limited capacity for processing information at any given time. This means that if too much information is

presented at once or if the instructional materials are poorly designed, the learners may experience cognitive overload (Mayer and Moreno 2003). Consequently, it is evident that simply adding visuals does not automatically improve learning, and they must instead be selected and used in ways that support rather than hinder cognitive processing.

Lastly, the active processing assumption suggests that meaningful learning occurs when learners are actively engaging in selecting relevant information, organising it into coherent mental representations, and then integrating it with their prior knowledge (Mayer 2002: 105). In other words, learners do not passively receive information, but rather, learning requires constant cognitive effort in order to make sense of incoming material. Simply being exposed to words and pictures is not sufficient, as learners must also attend to relevant elements, mentally structure them, and connect them to existing knowledge structures.

Taken together, these assumptions explain why multimedia instruction can be effective, while also emphasising that its success depends on instructional design. Learning is enhanced when verbal and visual information are presented in a coordinated way that accounts for cognitive limits and supports active processing rather than passive receiving. When materials are designed well, they can support learning by distributing input across channels, reducing unnecessary cognitive load, and promoting deeper processing. In particular, CTML underscores the importance of principles such as coherence, signaling, and spatial and temporal contiguity, which aim to reduce unnecessary cognitive processing and guide learners' attention toward essential information. Overall, CTML not only explains why combining words and images can support learning, but also points out the conditions under which multimedia instruction is most effective.

1.3.3 Cognitive Load Theory

The previous section of this thesis briefly touched upon the concept of cognitive load and its effect on learning. This term is the central aspect of the final theory relevant to the use of visual aids in education: the Cognitive Load Theory (CLT). It is closely related to CTML but provides a more detailed account of the limitations of human cognition and the implications that these limitations have for instructional design. This theory was primarily developed by John Sweller and colleagues and is based on research into working memory. The central premise of CLT is that learning is limited by the capacity of working memory, and that instructional materials should minimise unnecessary cognitive demands (Sweller et al. 2011).

This theory is grounded in models of memory that distinguish between sensory memory (which holds immediate incoming sensory information), short-term memory (a low-capacity storage that holds information for a short duration), and long-term memory (an almost limitless storage that can hold information for a very long time) (Craik and Lockhart 1972: 672). Of these three, short-term memory, more commonly referred to as working memory, plays a central role in learning, as it is responsible for processing information. However, its capacity is limited, meaning that excessive information can hinder learning (Zeyab 2017: 27). Baddeley's (1992: 554) model of working memory further divides working memory into verbal and visual subsystems, which are coordinated by a central executive. The central executive is responsible for allocating attentional resources between these subsystems, which handle verbal and visual-spatial input respectively. In the context of vocabulary learning, this distinction is especially relevant, as words may be processed both as verbal labels and as visual representations. When both channels are engaged simultaneously, as in dual-coding approaches,

learning may be enhanced due to more efficient distribution of cognitive resources across working memory systems.

CLT distinguishes between three different types of cognitive load. The first of these is intrinsic cognitive load, which refers to the inherent difficulty of the material itself and which is determined by the number of elements that must be processed and the cognitive effort they demand (e.g. learning ten new words is much harder than learning two). The second type is extraneous cognitive load, which is imposed by the manner that information is presented (e.g. messy visuals or confusing instructions). The final type is germane cognitive load, which refers to the "good effort" that a person's brain spends on making sense of things and building long-term memory connections (Sweller et al. 2011). Effective instruction should manage intrinsic load, minimise extraneous load, and promote germane processing (Chandler and Sweller 1991: 295).

From the perspective of CLT, visual aids can support learning by distributing information across verbal and visual channels, offloading some cognitive demands, thus reducing unnecessary cognitive load (Alabi 2024: 4). However, CLT also emphasises that visuals are not inherently beneficial to learners. Images that are poorly designed or overly complex, and materials that require learners to split their attention between multiple sources may actually increase extraneous load, thus hindering learning (Sweller et al. 2011; Mayer and Moreno 2003). If a learner has to spend too much effort on trying to understand what is happening in the picture, they will not be able to focus on learning.

Thus, the effectiveness of visual aids depends heavily on their design and integration. The mere presence of images does not guarantee effective learning. When used appropriately, they can support schema formation and help learners manage the high intrinsic load that comes with

vocabulary learning Sweller et al. (2011). When used poorly, however, they may overwhelm memory and impede learning.

To conclude, the theories discussed in this section provide a foundation for understanding how visual materials support learning. The Dual Coding Theory explains how verbal and visual information can be encoded through interconnected systems, while the Cognitive Theory of Multimedia Learning describes how learners actively process words and images during learning, emphasising the importance of dual channels, a limited working memory capacity, and meaningful engagement. The Cognitive Load Theory further helps understand this perspective by highlighting the limitations of working memory and stressing the role of instructional design in managing different types of cognitive load.

Taken together, these frameworks show that visual aids are not inherently effective simply because they are visual. Their value depends on how they are designed, presented, and processed by learners. While visuals can strengthen memory, reduce unnecessary cognitive load, and support deeper processing, they may also hinder learning if used incorrectly. Therefore, it is not only the presence of visuals that matters, but also how learners engage with them. This provides a basis for the following section, which focuses on learner-generated visuals and explores how actively creating visual representations may lead to even deeper processing and improved vocabulary retention.

1.4 Learner-Generated Visuals and Drawing as a Learning Strategy

While the previous section focused on theories explaining how provided visual materials can support learning, it is equally as important to consider the role of the learner as an active creator of visual representations. Increasing attention has been given to learner-generated visuals,

particularly drawing, as a learning strategy. Unlike pre-made images, which are passively received, drawing requires active engagement, as learners must construct meaning rather than simply interpret it. Although this approach has been less extensively studied, research suggests that generating drawings can enhance memory and retention. These benefits are commonly explained through various effects, which are: the generation effect, the production effect, and, most relevantly to this thesis, the drawing effect.

For the sake of clarity, "learner-generated drawing" in this thesis refers to drawings created by learners using simple tools such as a pen or pencil, not artificial intelligence. The definition used in this text will be the one proposed by Van Meter and Garner (2005: 287), who define learner-generated drawing as "a strategy in which learners construct drawing(s) to achieve a learning goal". Importantly, learners must have control over the final product, and the drawing must be representational (represent the physical appearance of the object), meaning that things such as flowcharts and concept maps are not included (Van Meter et al. 2006: 143). Thus, drawing is not treated as an artistic activity, but as a cognitive strategy meant to support learning through active processing.

From a theoretical perspective, learner-generated drawing differs from provided visuals in that it requires learners to transform information rather than just receive it. When learners create a drawing, they must select relevant elements, organise them into a coherent mental representation, and finally integrate them with prior knowledge (Van Meter and Garner 2005: 316). This process closely mirrors the active processing assumption described in Mayer's (2002) Cognitive Theory of Multimedia Learning, which also suggests that meaningful learning occurs when learners actively construct mental representations by selecting, organising, and integrating

information. However, unlike in the case of viewing, these processes are not optional when creating a drawing, as it forces learners to interpret meaning and decide how to represent it.

Drawing also influences cognitive load in complex ways. While the act itself does introduce additional effort compared to viewing images, this effort may also function as germane cognitive load (the "good" type of load), supporting schema construction and deeper processing (Sweller et al 2011). In this sense, the advantage of drawing lies not only in the final visual product, but also in the cognitive processes required to produce it. However, this benefit is not always guaranteed. If tasks are poorly designed or overly demanding, drawing may increase extraneous load and thus hinder learning, particularly for beginners, who may already be struggling to handle the new information they must process and retain.

The effectiveness of learner-generated drawing can be further understood through three cognitive phenomena. The first of these is the generation effect, which refers to the finding that self-generated information is remembered better than passively received information (Slamecka and Graf 1978). Slamecka and Graf discovered that subjects who generated a word (for example, by completing it based on its first letter) showed superior recall compared to if they had simply read it. This is typically explained by deeper semantic processing, stronger cue-target associations, and more elaborate encoding. More elaborate processing leads to more distinctive and interconnected representations in long-term memory (Slamecka and Graf 1978, MacLeod et al. 2010). This idea also ties in to the concept of levels of processing. Levels of processing, as proposed by Craik and Lockhart (1972: 676–677), refers to the depth of information processing, in which input that is processed more deeply leaves a stronger memory trace. Simply looking at an illustration, for example, may involve relatively shallower processing, as learners are merely looking at visuals and linking them to words. Learner-generated drawings, on the other hand,

demand deeper processing, since students must process the meaning of the word, translate that meaning into a mental image, and then physically create a representation of it, forcing deeper semantic and elaborative encoding, thus, resulting in a more persistent memory trace under certain conditions.

The production effect, in contrast, emphasises the role of distinctiveness. Information that is physically produced (e.g. spoken aloud) is remembered better because it creates a richer and more distinctive memory trace, especially when it is done in addition to more common forms of production (e.g. writing a word down) (MacLeod et al. 2010). This distinctiveness is the "active ingredient" of the effect, as produced words are differentiated by being processed differently against the backdrop of the unproduced words. Furthermore, MacLeod et al. assert that not all ways of engaging with items can produce this effect, as pressing a key or saying "yes" to a subset of the items, for example, is not unique enough. Drawing, on the other hand, is distinctive enough to trigger this effect, as it involves physical action, increasing distinctiveness through motor activity and visual output. However, unlike simple production, drawing combines motor, visual, and semantic processes, which suggests that its effects extend beyond production alone.

However, while the two may seem similar, the production effect differs slightly from the generation effect. Whereas the generation effect is concerned with the act of producing information that has not been explicitly given, the production effect concerns the physical act of producing information that is already present. In other words, generation involves either creating or completing information, while production involves articulating or externalising it. Both of the effects that have been described can enhance memory, but they operate in distinct ways. Generation emphasises elaboration and retrieval more, while production emphasises distinctiveness and multimodal encoding.

In relation to learner-generated drawing, some elements of the production effect are present. Drawing involves physical motor activity and external depictions of internal representations, which may increase distinctiveness and create additional sensory-motor memory traces. Furthermore, drawing requires coordination between visual perception and movement, potentially enriching the encoding experience. Unlike simple verbal production, drawing also incorporates visual components, which may further increase distinctiveness. However, as drawing also involves generation and elaboration, its benefits may extend beyond what can be explained by production alone.

While both of these effects explain why active engagement improves memory, neither fully accounts for the specific benefits of drawing. This is addressed by the drawing effect, which refers to a phenomenon in which drawing pictures of words provides a measurable boost to later memory performance when compared to simply writing it repeatedly, repeating it, or even mentally visualising it (Wammes et al. 2016). While drawing does share some characteristics with both the generation effect and the production effect, research has shown that it produces memory benefits that cannot be reduced to either of the two alone. Rather, it appears to function as a combination of both according to Meade et al. (2018: 370), who explain that in order to draw, learners first generate an internal image, for which they then produce a pictorial representation.

The drawing effect was first investigated systematically by Wammes et al. (2016), who demonstrated across multiple experiments that participants who drew target words during the study recalled significantly more items in a recall test than participants who engaged with the words in other ways (e.g by writing them out several times). However, proof of the drawing effect was demonstrated even earlier by Paivio and Csapo (1973), who, when testing the DCT,

also hinted at a memory advantage of pictures, especially drawn ones, over words, though the specific act of drawing as a strategy had not been examined in depth until much later.

The drawing effect is best understood as a multi-component encoding process. Drawing requires elaboration (understanding meaning), visual imagery (forming a mental image), motor action (physically producing the drawing), and pictorial representation (creating an external visual cue) (Wammes et al. 2016). These processes directly reflect the active processing assumption described in the CTML, as learners must select relevant features, organise them into a coherent visual structure, and integrate them with prior knowledge. They interact to form a rich, multisensory memory trace that supports retrieval. Unlike generation or production alone, drawing integrates multiple mechanisms simultaneously, making it a particularly powerful encoding strategy.

This perspective aligns with Fiorella and Mayer's (2015) generative learning theory, which emphasises that learning is most effective when learners actively select, organise, and integrate information. Drawing requires all three processes, making it inherently generative. At the same time, it also connects back to CLT. Although drawing requires additional effort, as noted by Schwamborn et al. 2011: 90, this effort may be beneficial if it is directed toward meaningful processing and schema construction rather than extraneous activity (Sweller et al. 2011).

However, research also highlights important limitations that should be taken into account when deciding whether to integrate drawing into learning. Studies on drawing suggest that their effectiveness depends heavily on task conditions. For example, doodling while learning has been shown to improve recall and maintain attention, particularly in low-demand or mostly auditory tasks, potentially by reducing mind-wandering and maintaining optimal arousal (Sundararaman

2020). Similarly, Zeyab (2017) reports that many learners perceive drawing as helpful for memory and engagement. That said, these benefits are not universal. Drawing may hinder performance in visually demanding tasks due to competition for cognitive resources, and some learners report that drawing is distracting or ineffective, especially when learners lack confidence in their drawing ability (Zeyab 2017: 89).

Another limitation relates to the nature of the target vocabulary. Not all lexical items are equally suitable for visual representation. Imageable and concrete words that denote tangible objects, actions, or attributes benefit more from visuals, including drawings (Alhazmi 2024: 392). Abstract concepts, on the other hand, may be too difficult or ambiguous to be represented visually. When learners attempt to visualise such concepts, they may produce oversimplified or unclear representations that do not fully capture the intended meaning, potentially leading to misunderstandings.

In addition to vocabulary-related constraints, a further limitation concerns the ecological validity of existing research. Much of the research on the drawing effect has been conducted under controlled experimental conditions, often using isolated word lists and short-term memory tasks. As a result, these findings may not fully represent authentic learning contexts. This limitation was also highlighted by Wammes et al. (2016: 1772), who noted that their experiments were not fully representative of an academic setting. Consequently, it remains unclear to what extent these findings transfer to authentic classroom environments, where learning is often influenced by a much wider range of variables, including time constraints, learner differences, and learning goals.

Taken together, these limitations indicate that the effectiveness of drawing is context-dependent rather than universal. Its success depends on factors such as task design,

cognitive demands, and even learner attitudes towards this relatively uncommon method. For instance, if learners focus too much on the artistic quality of the drawing rather than its meaning, or if they feel anxious about their drawing ability, the strategy may lose its effectiveness. Additionally, individual differences such as spatial ability or working memory capacity may influence how successfully learners are able to generate visual representations quickly and accurately. Lastly, some learners may perceive drawing as unsuitable for their age or proficiency level, or may simply dislike using it as a learning strategy, which may reduce engagement and limit the potential benefits.

Overall, learner-generated drawing can be understood as a synthesis of the theoretical principles discussed throughout this chapter. It builds on dual coding by combining verbal and visual representation, aligns with CTML through active processing, and reflects CLT by potentially transforming cognitive effort into meaningful learning. At the same time, it also incorporates mechanisms from both the generation and production effects.

Its effectiveness, however, is not guaranteed. Drawing may enhance learning when it promotes meaningful processing, but it may also hinder it if it introduces unnecessary load. This makes task design and learner experience central factors in determining its success. Taken together, the literature suggests that drawing is not merely a supplementary visual technique, but a cognitively complex learning strategy that has the potential to support vocabulary retention. At the same time, gaps remain, particularly regarding its effectiveness in adult beginner EFL contexts and in comparison to pre-made illustrations. Addressing these gaps provides the rationale for the present study.

2. METHODOLOGY OF THE STUDY

This chapter describes the methodology of a study investigating the effects of learner-generated drawing compared to pre-made illustrations on immediate and delayed vocabulary retention in adult beginner EFL learners. It addresses two research questions concerning the comparative effectiveness of the two conditions and learners' perceptions of drawing as a learning strategy.

2.1 Research Design

The study employed a within-subjects experimental design, in which each participant was exposed to both experimental conditions (drawing and pre-made illustration), but with different lexical items. In experimental research, a within-subjects design (also known as repeated measures design) involves exposing the same participant to multiple conditions, which allows each individual to serve as their own control (Mackey and Gass 2005: 150). This design was selected to minimise the influence of variables such as differences in language proficiency, drawing ability, or general memory capacity.

The study also incorporated a counterbalanced structure, in which the order of conditions varied across participants (Mackey and Gass 2005: 143). The 16 target vocabulary items were divided into two sets of eight words (Set A and Set B). Participants were divided into two groups. Group 1 learned Set A through learner-generated drawing and Set B through pre-made illustrations, whereas Group 2 learned Set A through pre-made illustrations and Set B through drawing. This counterbalancing ensured that each set appeared equally often in each condition, thereby reducing the possibility that differences in the words could affect the results.

The independent variable was the type of visual support (learner-generated drawing vs. pre-made illustration). To ensure comparability, testing procedures and time spent on tasks were kept identical across conditions. The dependent variable was vocabulary recall, measured through immediate and delayed recall tests.

Overall, the experiment followed a repeated structure consisting of a pre-test, two learning phases, two immediate recall tests, and one delayed recall test administered approximately one week later. Each phase also included a short filler task to minimise short-term memory effects. This structure enabled the measurement of both immediate learning and longer-term retention while also allowing comparison between conditions within participants.

A pilot study was conducted prior to the main experiment to test the materials and procedures. This is described in more detail in section 2.5.

2.2 Materials

The materials consisted of learning worksheets (Appendix 3), pre-made illustrations (Appendix 2), vocabulary tests (Appendix 4), filler tasks, and a post-experiment questionnaire (Appendix 5; administered in Estonian). Only representative examples of the materials are included in the appendices due to space limitations. However, the materials followed the same structure and format. All materials were designed specifically for the purposes of this study and were used to ensure that the experimental conditions remained consistent across all participants.

The target vocabulary items consisted of 16 English concrete nouns paired with their Estonian equivalents. Concrete nouns were selected for this study because they are generally more likely to have corresponding images than abstract words, thus making them easier to represent visually and therefore suitable for drawing tasks (Clark and Paivio 1991: 155). The

words were chosen to be relatively unambiguous and easily depictable. The target items were divided into two sets, which were used in the counterbalanced experimental design described earlier.

The sets used in the main study were as follows: Set A included the words *mushroom* (seen), *fish* (kala), *cake* (kook), *lemon* (sidrun), *sausage* (vorst), *donut* (sõõrik), *egg* (muna), and *grapes* (viinamarjad). Set B included the words *pear* (pirn), *cookie* (küpsis), *pumpkin* (kõrvits), *cherries* (kirsid), *corn* (mais), *lollipop* (pulgakomm), *cabbage* (kapsas), and *carrot* (porgand). These items were chosen because they represent concrete and visually depictable concepts, making them suitable for both the drawing and illustration conditions. In addition, care was taken to avoid items that might be too difficult to represent visually or that could be easily confused with one another.

Separate worksheets were prepared for each condition. In both conditions, participants were shown the Estonian word and its English equivalent. In the drawing condition, space was provided for participants to create a simple drawing. In the illustration condition, a pre-made image representing the same concept was provided.

All illustrations were simple black-and-white digital drawings created by the author of this thesis to ensure stylistic consistency. Although Paivio and Csapo (1973: 177) found that colours do not significantly enhance recall compared to uncoloured versions of the same items, it was nevertheless decided that colour would not be used in this study. This was done to avoid introducing unnecessary visual detail and to maintain comparability with participant drawings.

Vocabulary knowledge was measured using a pre-test, two immediate recall tests, and one delayed test. Participants were asked to translate words from Estonian into English without visual support. Minor spelling errors were accepted if the intended word was still clearly

recognisable. The pre-test and delayed recall test were identical in format and item order, which is why only one version is included in the appendices. Furthermore, although two versions of the immediate recall test were used, corresponding to Sets A and B, they only differ by which eight words are included, and therefore only one sample is provided.

Filler tasks consisting of arithmetic problems were used between learning and tests to reduce rehearsal and short-term memory effects. This was inspired by Meade et al. (2018), who, in their own drawing-related experiments, also used filler tasks to reduce short-term memory effects and to disrupt additional processing of the study material that the participants may engage in, such as rehearsing words. Mathematical problems were selected as the filler tasks in the present study because they were easy to administer and did not require specialised tools or materials.

Finally, participants completed an online questionnaire consisting of five Likert-scale statements and three open-ended questions. The Likert-scale statements used a five-point scale, where 1 corresponded to *Ei nõustu üldse* (“strongly disagree”) and 5 to *Nõustun täielikult* (“strongly agree”). The intermediate values represented varying degrees of agreement. This qualitative component was included to account for factors such as learners’ attitudes towards drawing, which may influence engagement and learning outcomes.

2.3 Procedure

The experiment consisted of two sessions conducted approximately one week apart. Participants were informed that they could withdraw at any time without consequences. Prior to the experiment, participants were told that they would be learning new English vocabulary under two different conditions and that their memory would be tested afterwards. The time limit was

also explicitly stated beforehand to ensure a smooth transition between items. During the task, participants were instructed to either draw a simple representation of the word or observe a pre-made illustration, write the word once, and pay attention to its pronunciation. No additional learning strategies or aids were provided.

During the first session, participants completed a pre-test consisting of all 16 target vocabulary items. The words were given in Estonian and participants were asked to provide the English equivalent if they were familiar with the word. The purpose of the pre-test was to identify any items that participants already knew before the learning phase. Participants were instructed to leave an item blank if they were unsure of the correct answer rather than trying to guess it.

Participants then completed two learning phases, each consisting of eight words (16 items in total). Depending on the condition, they either drew the word or studied an illustration. In both cases, the Estonian word, English equivalent, and pronunciation model were provided, and participants also wrote the English word once. Although the worksheets displayed multiple items on a single page due to the way they were designed, participants were instructed to focus on one word at a time. Each item was studied sequentially for 45 seconds, after which participants moved on to the next word. The time limit was strictly controlled to ensure that any differences in performance could be attributed to the learning condition rather than differences in exposure duration.

After each learning phase (i.e. after completing all eight items in that condition), participants completed a short filler task that required them to solve simple mathematical equations. There were two filler tasks in total, one following each learning phase. Following each filler task, participants completed an immediate recall test in which they again translated the

Estonian words into English without any visual support. The immediate recall tests contained only the words studied in the preceding learning phase.

After completing the first learning phase, filler task, and immediate recall test, participants proceeded to the second learning phase with the remaining set of vocabulary items while switching conditions (from drawing to studying illustrations or vice versa). The same structure was repeated, ensuring that each set of vocabulary items appeared in both learning conditions across different participants. After completing both phases, the first session ended.

In the second session (approximately one week later), participants completed a delayed recall test including all 16 items in randomised order. Afterward, they completed the questionnaire anonymously.

2.4 Pilot Study

Before conducting the main experiment, a pilot study was carried out in order to test the feasibility of the procedure and materials. Due to practical constraints, the pilot study involved only two participants, both of whom were adult beginner learners, making them similar in characteristics to those expected in the main study. At the time of the study, both participants had been studying English for less than a year. The participants were recruited through convenience sampling, which is a sampling method that involves selecting participants who are the most available or accessible subjects in the population (Mackey and Gass 2005: 122). Each participant in the pilot study completed the experiment individually and represented one of the two experimental groups in the counterbalanced design.

The pilot study followed the same general procedure that was described in section 2.3. As the exact vocabulary items for the main study had not yet been determined and would be

selected based on the participants' needs, a different set of words was used in the pilot study. The sets used in the pilot study were as follows: Set A included the words *ladder* (redel), *window* (aken), *branch* (oks), *envelope* (ümbrik), *drawer* (sahtel), *towel* (rätik), *glove* (kinnas), and *bridge* (sild). Set B included the words *chimney* (korsten), *pillow* (padi), *candle* (küünal), *shovel* (labidas), *curtain* (kardin), *suitcase* (kohver), *scissors* (käärid), and *nest* (pesa). The illustrations of the selected words can be seen in Appendix 1.

The main purpose of the pilot study was to determine whether the instructions were clear, and whether the timing was suitable. In particular, the pilot study aimed to determine whether participants were able to complete the drawing tasks within the given time limit and if the style of illustrations they were shown was easily recognisable and could be interpreted correctly.

Following the pilot session, participants were asked for feedback regarding the clarity of instructions, the difficulty of the vocabulary items, and the adequacy of the time allocated. Their comments were used to identify any potential issues with the materials or the experimental procedure. In addition, pilot participants also completed the questionnaire used in the main study. However, their responses were not included in the final analysis.

The pilot study showed that the overall design of the experiment was appropriate and feasible for the target group. No major issues were observed during the sessions. The allocated time of 45 seconds per item appeared sufficient for both the drawing and the illustration conditions, as participants were able to complete the tasks without difficulty. The number of target items was also found to be manageable within the given timeframe.

Based on the observations from the pilot, one minor adjustment was made to the procedure. The duration of the filler task was reduced from four minutes to three minutes, as the original length appeared unnecessarily long and risked reducing participant engagement. This

change did not affect the structure of the task. Furthermore, the first session of the pilot study was slightly longer (by roughly 15 minutes) due to the wording of the instructions still being a work in process. Based on the pilot, it was estimated that a more streamlined first session in the main study would take approximately 45 minutes. This estimated timing includes the tests, learning phases, filler tasks, and instructions.

Overall, the pilot study confirmed that the materials, timing, and instructions were suitable for use in the main study. Furthermore, feedback from participants showed that they did not experience confusion regarding any of the aspects of the experiment.

2.5 Main Study

Following the pilot study, the main study was conducted with a total of 10 adult beginner learners of English. Five participants were recruited from an existing adult education language learning course, while the remaining participants were recruited by the author of the thesis through personal contacts. All of them were adult learners with beginner-level proficiency in English. All participants reported having minimal formal experience of studying English before beginning their current course or participation in the study. Despite being drawn from two different sources, all participants were therefore treated as broadly comparable in terms of their proficiency level and prior exposure to English. No demographic data such as age, gender, or L1 background were collected, as the study focused primarily on immediate and delayed vocabulary recall rather than individual learner differences. All participants were informed of the purpose of the study and were also assured that their responses would remain anonymous.

The learners were divided into two groups for the purposes of the counterbalanced design described in section 2.2. Each group completed both experimental conditions, though with different sets of target vocabulary items.

The target vocabulary items used in the main study were different from those used in the pilot study. The final selection consisted of 16 concrete nouns related to food, as suggested by the course instructor to better align the materials with the learners' needs. At the same time, care was taken to ensure that the selected vocabulary did not directly overlap with the coursebook content, in order to minimise the likelihood of participants encountering the items outside of the experimental setting. The words were: 'mushroom', 'fish', 'cake', 'lemon', 'sausage', 'donut', 'egg', 'grapes', 'pear', 'cookie', 'pumpkin', 'cherries', 'corn', 'lollipop', 'cabbage', and 'carrot'.

Although the initial gap between the immediate and delayed test was intended to be a week, it was not possible due to changes made in the language course participants' lesson schedule. As a result, the gap was reduced to six days for all participants.

Although it was not possible to fully control participants' exposure to the target vocabulary between the two sessions, some measures were taken to minimise potential external influences. The selected vocabulary items were not directly taken from the coursebook, reducing the likelihood of incidental exposure. In addition, participants did not keep the learning materials after the first session to ensure that they could not use them for rehearsing. The delayed recall test also presented the words in a randomised order to reduce potential order effects.

2.6 Data Collection and Analysis

The data were collected through the pre-test, two immediate recall tests, one delayed recall test, and a questionnaire. The vocabulary tests provided quantitative data on participants'

knowledge and retention of the target vocabulary, while the questionnaire yielded qualitative data regarding participants' perceptions of the learning methods. Pre-test results were used to exclude already known items from analysis.

Participants' responses in the recall tests were collected in written form. Each response was evaluated as either correct or incorrect, and a response was considered correct if the respondent had produced the correct English equivalent of the given Estonian word. Minor spelling errors were accepted as long as the intended word was still clearly recognisable. Each correct answer received one point, whereas incorrect or missing answers received zero points.

For each participant, the total number of correctly recalled items was calculated separately for each experimental condition. Mean scores were then compared across conditions for both immediate and delayed recall to determine whether one learning strategy resulted in notably higher vocabulary retention than the other. Questionnaire responses were analysed qualitatively to identify any patterns in learner perceptions of drawing as a strategy. Because they were collected anonymously, it was not possible to link individual responses to specific participants or their test performance.

2.7 Results

2.7.1 Pre-test results

The pre-test was administered to determine whether participants had prior knowledge of the target vocabulary items. The results indicate that prior knowledge varied across participants, with scores ranging from 0 to 7 known items out of 16. The average number of known items was 3.8 (SD = 2.4, where SD refers to the standard deviation and indicates the amount of variation in participants' scores), as shown in Table 1.

Overall, the results suggest that most of the target vocabulary items were unfamiliar to the participants. Although some demonstrated partial prior knowledge, none of them knew more than half of the items.

For a word to be counted as known, its written form had to be sufficiently close to the target item, meaning that minor spelling errors were accepted as long as the intended word remained clearly recognisable. All items identified as known in the pre-test were excluded from subsequent analyses to ensure that the results reflected newly learned vocabulary rather than prior knowledge.

Table 1. Descriptive statistics for pre-test scores

N	Mean	SD	Min	Max
10	3.8	2.4	0	7

2.7.2 Immediate post-test results

The immediate recall results showed a difference between the two learning conditions (see Table 2). Participants achieved a higher mean score in the illustration condition (M = 91.13, SD = 12.91) than in the drawing condition (M = 65.52, SD = 25.39). The difference between the participants' performances in the two conditions was approximately 26%.

Although some participants performed similarly in both conditions, the majority demonstrated higher recall scores in the illustration condition. In addition, greater variability was observed in the drawing condition, as reflected in the higher standard deviation.

Table 2. Immediate recall scores by condition (percent correct)

Condition	Mean (%)	SD
Drawing	65.52	25.39
Illustration	91.13	12.91

2.7.3 Delayed post-test results

The delayed post-test results revealed a different pattern compared to the immediate recall results. Overall, recall scores decreased in both conditions, indicating a decline in retention over time (see Table 3). In the drawing condition, scores decreased by approximately 10.80%, whereas the illustration condition showed a larger decline of approximately 34.89%.

The mean percentage of correct answers in the drawing condition was 54.72 (SD = 30.72), while the mean score in the illustration condition was 56.24 (SD = 28.77). Unlike the immediate post-test, where a clear advantage for the illustration condition was observed, the difference between the two conditions in the delayed test was minimal (approximately 1.52 percentage points).

In addition, both conditions showed considerable variability, as reflected in the relatively high standard deviations. This suggests that participants differed substantially in how well they retained the vocabulary over time.

Although overall performance declined, some participants maintained or even improved their scores in the delayed test compared to the immediate post-tests in some cases.

It should be noted that one participant did not complete the delayed post-test due to circumstances beyond the researcher's control. Therefore, the results presented in this section are

based on nine participants, whereas the pre-test and immediate post-test results include all ten participants.

Table 3. Delayed recall scores by condition (percent correct)

Condition	Mean (%)	SD
Drawing	54.72	30.72
Illustration	56.24	28.77

2.7.4 Questionnaire results

The questionnaire consisted of five Likert-scale items and three open-ended questions aimed at exploring learners' perceptions of drawing as a vocabulary learning strategy. The questionnaire was completed by eight out of ten participants. Two participants did not submit responses in time.

Overall, the responses to the Likert-scale items were mixed (see Table 4). The statement "Drawing helped me remember the words better" (Q1) most frequently received a response of 4 (mode = 4), indicating a general tendency towards agreement, although responses varied.

In contrast, the statement "Viewing pictures helped me remember the words better" (Q2) most frequently received a neutral response (mode = 3), indicating a neutral overall evaluation of pre-made illustrations.

In the responses to Q3, participants most frequently selected 4 (mode = 4), suggesting that drawing was generally perceived as requiring more mental effort than viewing images.

Despite this, Q4 showed that drawing was still perceived as relatively useful, as it most frequently received the highest response option (mode = 5). Similarly, Q5 also had a mode of 5,

suggesting a generally positive willingness to use drawing as a learning strategy in the future. However, the overall spread of responses indicates considerable individual differences in attitudes towards drawing.

Taken together, these results suggest that while drawing is generally viewed positively, it is also perceived as more effortful, and learner attitudes towards it vary considerably.

Table 4. Descriptive statistics for Likert-scale responses

Question	Mean	Mode	SD
Q1	3.25	4	1.39
Q2	3.00	3	1.41
Q3	3.38	4	1.51
Q4	3.63	5	1.51
Q5	3.50	5	1.81

The open-ended responses provided further insight into participants' learning strategies and attitudes. In response to how they typically learn new vocabulary (Q6), participants reported a range of different strategies, including repetition, using words in context, listening and pronunciation practice, and incidental learning through exposure. Some participants also mentioned combining visual and verbal methods, such as associating words with images or using flashcards.

Responses to Q7 revealed mixed attitudes towards drawing as a learning strategy. Some reported that drawing supported memory by creating mental visual associations (e.g. "it connects better as an image" and "I spend more time on the word"). Others, however, indicated that

drawing was not helpful for them, either due to difficulties with drawing or a lack of personal preference (e.g. “I don’t like drawing” or “I couldn’t form a connection between the image and the word”). One participant noted that differences in drawing ability may affect how useful the strategy is.

Finally, responses to Q8 (prompting for additional comments or insights) did not provide additional insights directly related to the research questions, but included generally positive feedback, with some participants describing the topic as interesting. It was also noted by one participant that vocabulary learning strategies may differ across age groups.

2.7.5 Vocabulary item analysis

An item-level analysis was conducted to examine whether certain vocabulary items were recalled more successfully than others across the two learning conditions. Appendix 6 presents the number of correct recalls for each vocabulary item in the pre-test, immediate post-test, and delayed post-test. Each word was learned through drawing by five participants and through illustrations by five participants. The immediate and delayed columns in the appendix indicate the number of participants who correctly recalled each word in each condition. One participant did not complete the delayed post-test resulting in a maximum score of four for some delayed items depending on condition assignment. In addition, ‘N/A’ indicated cases where a word was already known by all participants in that condition and was therefore excluded from analysis.

The item-level results revealed some differences between vocabulary items and learning conditions. Some words, such as ‘pumpkin’, ‘lollipop’, and ‘grapes’ achieved high recall scores in both conditions, suggesting that these items may have been easier for participants to remember

overall. However, several vocabulary items appeared to benefit more clearly from one learning condition than the other.

For example, ‘pear’ and ‘cabbage’ showed higher immediate recall scores in the illustration condition than in the drawing condition. In contrast, ‘egg’ and ‘grapes’ showed higher recall scores in the drawing condition. These differences might suggest that the effectiveness of drawing and illustration may have varied depending on the vocabulary item.

In the delayed post-test, recall scores generally decreased across both conditions. However, some items retained relatively high recall rates, including ‘grapes’ and ‘mushroom’ in the drawing condition. In some cases, delayed recall scores were slightly higher than immediate recall scores for particular items. This shows that, in rare cases, some participants were able to retrieve certain vocabulary items during the delayed test despite not recalling them successfully in the immediate post-test.

Overall, the item-level analysis seems to suggest that neither learning condition was consistently superior for all vocabulary items. Instead, the effectiveness of drawing and illustration appeared to vary across individual words.

DISCUSSION

The aim of this study was to compare the effects of learner-generated drawing and pre-made illustrations on vocabulary retention in adult beginner EFL learners. More specifically, the study examined whether actively producing drawings would lead to higher immediate and delayed recall compared to learning with teacher-provided images, as well as how learners perceive drawing as a learning strategy. Based on previous research (e.g. Wammes et al. 2016; Meade et al. 2018), it was expected that learner-generated drawing would result in superior retention due to deeper cognitive processing. However, these earlier studies were conducted primarily with adult native speakers in controlled memory tasks rather than in foreign language learning contexts, which may limit their direct applicability to beginner EFL learners.

In regard to the first research question, the findings indicate that learner-generated drawing did not result in higher immediate recall and showed only minimal differences in delayed retention when compared to pre-made illustrations. Therefore, the initial hypothesis was not supported. The second research question, which concerned learners' perceptions of drawing as a strategy, is addressed later in this section based on the questionnaire results.

The results of the immediate post-test did not fully support the initial hypothesis. Contrary to expectations, participants achieved higher recall scores in the illustration condition than in the drawing condition, with the difference between them being 26%. This suggests that, in this study, learning with pre-made illustrations was more effective for immediate vocabulary retention. One possible explanation for this finding may lie in the time constraints of the task. Participants were given only 45 seconds per item, during which they had to process the word, write it, listen to its pronunciation, and either view or produce a visual representation. While this

time was likely sufficient for interpreting pre-made illustrations, it may not have allowed learners to generate meaningful drawings, thereby limiting the potential benefits of deeper processing.

In addition, learner-generated drawing may have imposed a higher cognitive load on participants, particularly when combined with the other task demands. Drawing requires not only understanding the word but also planning and producing a visual representation. For beginner learners, this additional demand may have interfered with effective encoding under time pressure. This interpretation is consistent with Cognitive Load Theory (Sweller et al. 2011), which suggests that excessive task demands can hinder learning by overwhelming learners' limited processing capacity.

Furthermore, the proficiency level of the participants may also have contributed to the results. As beginner learners, participants may have benefitted more from clear and immediately interpretable visual input provided by pre-made illustrations rather than from generating their own representations. Pre-made illustrations likely reduced ambiguity and provided direct semantic support, which may be especially beneficial at lower proficiency levels where learners have limited linguistic resources. This suggests that the benefits of drawing observed in previous research may not directly transfer to beginner EFL learners, and that the effectiveness of visual strategies may depend on learner proficiency.

The delayed post-test results provided further insights into the effectiveness of the two learning conditions over time. Although both conditions showed a decline in performance, the decrease was substantially larger in the illustration condition than in the drawing condition, resulting in a more similar performance overall. While items learned through illustrations were still remembered slightly better, the difference was minimal. This finding partially aligns with previous research on generative learning strategies (e.g. Fiorella and Mayer 2015), which

suggests that actively producing material can lead to more durable memory traces, even if it does not always produce immediate benefits. It may also be interpreted in light of Dual Coding Theory (Paivio and Csapo 1973), which proposes that information encoded through multiple modalities may be more resistant to forgetting.

One possible explanation for this is that drawing, even under time constraints, may have encouraged relatively deeper processing, supporting longer-term retention. Pre-made illustrations, in contrast, may have enabled faster but more surface-level processing, leading to stronger short-term recall but greater forgetting over time.

The vocabulary item analysis also suggested that the effectiveness of the two learning conditions was not consistent across all words. While some vocabulary items were recalled successfully regardless of conditions, others appeared to benefit more from either drawing or illustration. This may indicate that the effectiveness of visual vocabulary learning strategies may partly depend on the characteristics of individual lexical items, such as how easily they can be visually represented or distinguished from similar concepts.

An additional observation was that spelling accuracy declined in the delayed test, even when words themselves were still recalled. This suggests that while visual strategies may support semantic retention, they may be less effective in reinforcing orthographic accuracy. This observation highlights the need for repeated written practice for supporting accurate vocabulary production over time.

However, it should also be noted that the high variability observed in both conditions suggests that these effects were not the same across participants. Notably, some maintained or even improved their performance in the delayed test. This may indicate individual differences in

strategy use, engagement, or possible external exposure to the target vocabulary, which could not be fully controlled in this study.

The questionnaire provided additional insights into what the participants thought of the two learning conditions and helped contextualise the quantitative findings. Overall, participants' evaluations of drawing were mixed, which aligns with both the variability that was observed in the test results and the spread of responses in the questionnaire. While some reported that drawing supported memory by creating visual associations or increasing time spent on each word, others indicated that it was less effective due to difficulties with drawing or a lack of personal preference.

Importantly, participants generally perceived drawing as requiring more mental effort than viewing pre-made illustrations. This supports the interpretation that the drawing condition imposed a higher cognitive load, which may have contributed to its lower performance in the immediate post-test. At the same time, however, some participants noted that drawing encouraged greater focus or engagement with the words, which may explain the relatively smaller decline observed in the delayed test.

The responses also highlight the role of individual differences in the effectiveness of drawing as a learning strategy. Factors such as drawing ability, motivation, and personal preferences appeared to influence how beneficial the strategy was for different learners, which may explain the high variability observed in the drawing condition across both immediate and delayed recall.

Finally, although participants showed a moderate level of willingness to use drawing in the future, this was not consistent across all individuals in the study. This suggests that while learner-generated drawing may be beneficial for some, it may not be universally effective or

preferred, and should, therefore, be considered as one of the several possible vocabulary learning strategies rather than an approach suitable for everyone.

It should be noted, however, that this study has several limitations that should be taken into account when interpreting the results. Firstly, the sample size was relatively small (N = 10 for most of the study, N = 9 for the delayed post-test, and N = 8 for the questionnaire), which limits the generalisability of the findings. Furthermore, the absence of demographic data (such as age and L1) also limits the possibility to generalise findings across learner populations. Secondly, it was not possible to control participants' exposure to the target vocabulary outside the experimental setting between sessions. Thirdly, the time constraints of 45 seconds per item may have limited the depth of processing, particularly in the drawing condition. Additionally, individual differences in drawing ability and attitudes may have influenced engagement and performance. Lastly, the study focused exclusively on concrete nouns that were relatively easy to represent visually, meaning the findings may not be applicable to more abstract vocabulary.

Future research could address these limitations by including larger sample sizes and a wider range of vocabulary, including more abstract items. It would also be valuable to further investigate the role of individual differences, such as drawing ability, motivation, and learning preferences in shaping the effectiveness of visual strategies. Additionally, studies could explore the long-term effects of drawing over extended time intervals and examine whether the findings generalise across different learner populations and contexts.

The findings of this study have several pedagogical implications for vocabulary instruction in adult beginner EFL contexts. Pre-made illustrations appear to be more effective and consistent for supporting immediate vocabulary recall, particularly under time constraints and at lower proficiency levels. Therefore, teachers may benefit from using clear and

unambiguous visual aids when introducing new vocabulary. At the same time, learner-generated drawing may support more long-term retention, but its effectiveness appears to depend on the conditions under which it is used. Drawing may be more beneficial when learners are given sufficient time and when the activity does not impose excessive cognitive load, suggesting that it may be best used as a supplementary rather than primary strategy.

Furthermore, the results highlight the importance of individual differences in learning preferences and abilities. Since not all learners benefit equally from drawing, it may be useful to provide a range of learning strategies and allow learners some degree of choice. Finally, the observed decline in spelling accuracy indicates that visual strategies alone may not be sufficient for developing accurate written forms, and should therefore be combined with activities that reinforce spelling and written production.

CONCLUSION

The goal of this study was to compare the effects of learner-generated drawing and pre-made illustrations on vocabulary retention in adult beginner EFL learners, as well as to examine learners' perceptions of drawing as a learning strategy. The findings indicate that pre-made illustrations led to higher immediate recall, whereas learner-generated drawing did not result in superior performance in the immediate post-test. In the delayed post-test, however, the difference between the two conditions became minimal due to a greater decline in the illustration condition. This finding suggests that while pre-made illustrations may support initial learning more effectively, learner-generated drawing may contribute to more stable retention over time.

In terms of learners' perceptions, the questionnaire results revealed mixed attitudes towards drawing. While some participants found the strategy helpful for creating associations and increasing engagement, others described it as difficult and requiring greater effort. From this it was concluded that individual differences play a great role in the effectiveness of this strategy, and that while some may enjoy it, others might prefer different methods.

Overall, the results of the study show that although drawing is a promising tool for supporting memory, it is not an unequivocally superior method for vocabulary learning in adult beginner contexts, but rather a strategy whose effectiveness depends on multiple different factors. Pre-made illustrations, the more conventional method examined in this study, appear to provide more reliable support for initial vocabulary acquisition, possibly due to being less cognitively demanding. However, this does not mean that drawing should be disregarded completely, as it has the potential to offer additional benefits for longer-term retention under appropriate conditions. Thus, if teachers are willing to implement drawing activities while taking learners' needs and limitations into account, it may serve as a valuable supplementary strategy

that can enhance engagement and support longer-term vocabulary retention alongside more structured approaches.

To the author's knowledge, relatively little research has examined the effects of learner-generated drawing specifically in adult beginner EFL contexts. It is possible that the effectiveness of drawing as a vocabulary learning strategy is influenced by learners' language proficiency, as beginners may experience greater cognitive demands when simultaneously processing unfamiliar vocabulary and producing drawings. Further research is therefore needed to examine how proficiency level may affect the usefulness of drawing-based learning strategies.

REFERENCES

Alhazmi, Khaled. 2024. The Effect of Multimedia on Vocabulary Learning and Retention. *World Journal of English Language*, 14: 6, 390–399.

Alabi, Moses. 2024. *Visual Learning: The Power of Visual Aids and Multimedia.* Unpublished paper. Ladoke Akintola University of Technology: Nigeria.

Alqahtani, Mofareh. 2015. The Importance of Vocabulary in Language Learning and How to be Taught. *International Journal of Teaching and Education*, 3: 3, 21–34.

Baddeley, Alan. 1992. Working Memory. *Science*, 255: 5044, 556–559.

Carney, Russell N. and Joel R. Levin. 2002. Pictorial Illustrations Still Improve Students' Learning from Text. *Educational Psychology Review*, 14: 1, 5–26.

Chandler, Paul and John Sweller. 1991. Cognitive Load Theory and the Format of Instruction. *Cognition and Instruction*, 8: 4, 293–332.

Clark, James M. and Allan Paivio. 1991. Dual Coding Theory and Education. *Educational Psychology Review*, 3: 3, 149–210.

Craik, Fergus I. M and Robert S. Lockhart. 1972. Levels of Processing: A Framework for Memory Research. *Journal of Verbal Learning and Verbal Behaviour,* 11: 6, 671-684.

Felten, Peter. 2008. Visual Literacy. *Change: The Magazine of Higher Learning*. 40: 6, 1–12.

Fiorella, Logan and Richard E. Mayer. 2015. *Learning as a Generative Activity: Eight Learning Strategies that Promote Understanding*. Cambridge: Cambridge University Press.

Harmer, Jeremy. 2007. *The Practice of English Language Teaching.* The United Kingdom: Pearson Longman.

Kaphle, Keshav Raj. 2024. Challenges of Learning English Vocabulary. *Janaprakash Journal of Multidisciplinary Research*, 2: December, 31–43.

Krashen, Stephen. 1982. *Principles and Practice in Second Language Acquisition*. Oxford: Pergamon Press Inc.

Laufer, Batia. 1997. The Lexical Plight in Second Language Reading. In James Coady and Thomas Hucking (eds). *Second Language Vocabulary Acquisition. A Rationale for Pedagogy.* Cambridge: Cambridge University Press.

Ma, Qing. 2009. *Second Language Vocabulary Acquisition.* New York: Peter Lang.

Mackey, Alison and Susan M. Gass. 2005. *Second Language Research: Methodology and Design*. London: Lawrence Erlbaum Associates.

MacLeod, Colin M., Nigel Gopie, Kathleen L. Hourihan, Karen R. Neary, and Jason D. Ozubko. 2010. The Production Effect: Delineation of a Phenomenon. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 36: 3, 671–685.

Mayer, Richard E. 2002. Multimedia Learning. *The Psychology of Learning and Motivation*, 41, June, 85–139.

Mayer, Richard E. 2024. The Past, Present, and Future of the Cognitive Theory of Multimedia Learning. *Educational Psychology Review*, 36: 8, 1–25.

Mayer, Richard E. and Roxana Moreno. 2003. Nine Ways to Reduce Cognitive Load in Multimedia Learning. *Educational Psychologist,* 38: 1, 43–52.

Meade, Melissa E., Jeffrey D. Wammes, and Myra A. Fernandes. 2018. Drawing as an Encoding Tool: Memorial Benefits in Younger and Older Adults. *Experimental Aging Research*, 44: 5, 369–396.

Nation, Paul. 2001. *Learning Vocabulary in Another Language*. Cambridge: Cambridge University Press.

Paivio, Allan and Kalman Csapo. 1973. Picture Superiority in Free Recall: Imagery or Dual Coding? *Cognitive Psychology*, 5: 2, 176–206.

Pichette, François. 2002. Second-Language Vocabulary Learning and the Additivity Hypothesis. *Canadian Journal of Applied Linguistics*, 5: 1–2, 117–130.

Raiyn, Jamal. 2016. The Role of Visual Learning in Improving Students' High-Order Thinking Skills. *Journal of Education and Practice*, 7: 24, 115–121.

Schmitt, Norbert. 2000. *Vocabulary in Language Teaching*. Cambridge: Cambridge University Press.

Schmitt, Norbert. 2014. Size and Depth of Vocabulary Knowledge: What the Research Shows. *Language Learning*, 64: 4, 913–951.

Schwamborn, Annett, Hubertina Thillmann, Maria Opfermann, and Detlev Leutner. 2011. Cognitive Load and Instructionally Supported Learning with Provided and Learner-Generated Visualisations. *Computers in Human Behavior*, 27: 11, 89–93.

Slamecka, Norman J. and Peter Graf. 1978. The Generation Effect: Delineation of a Phenomenon. *Journal of Experimental Psychology: Human Learning and Memory*, 4: 6, 592–604.

Sweller, John, Paul Ayres, and Slava Kalyuga. 2011. *Cognitive Load Theory*. New York: Springer.

Ur, Penny. 2012. *A Course in English Language Teaching*. The United Kingdom: Cambridge University Press.

Van Meter, Peggy and Joanna Garner. 2005. The Promise and Practice of Learner-Generated Drawing: Literature Review and Synthesis. *Educational Psychology Review*, 17: 4, 285–325.

Van Meter, Peggy, Maja Aleksic, Ana Schwartz, and Joanna Garner. 2006. Learner-Generated Drawing as a Strategy for Learning from Content Area Text. *Contemporary Educational Psychology*, 31: 2, 142–166.

Wammes, Jeffrey D., Melissa E. Meade, and Myra A. Fernandes. 2016. The Drawing Effect: Evidence for Reliable and Robust Memory Benefits in Free Recall. *The Quarterly Journal of Experimental Psychology*, 69: 9, 1752–1776.

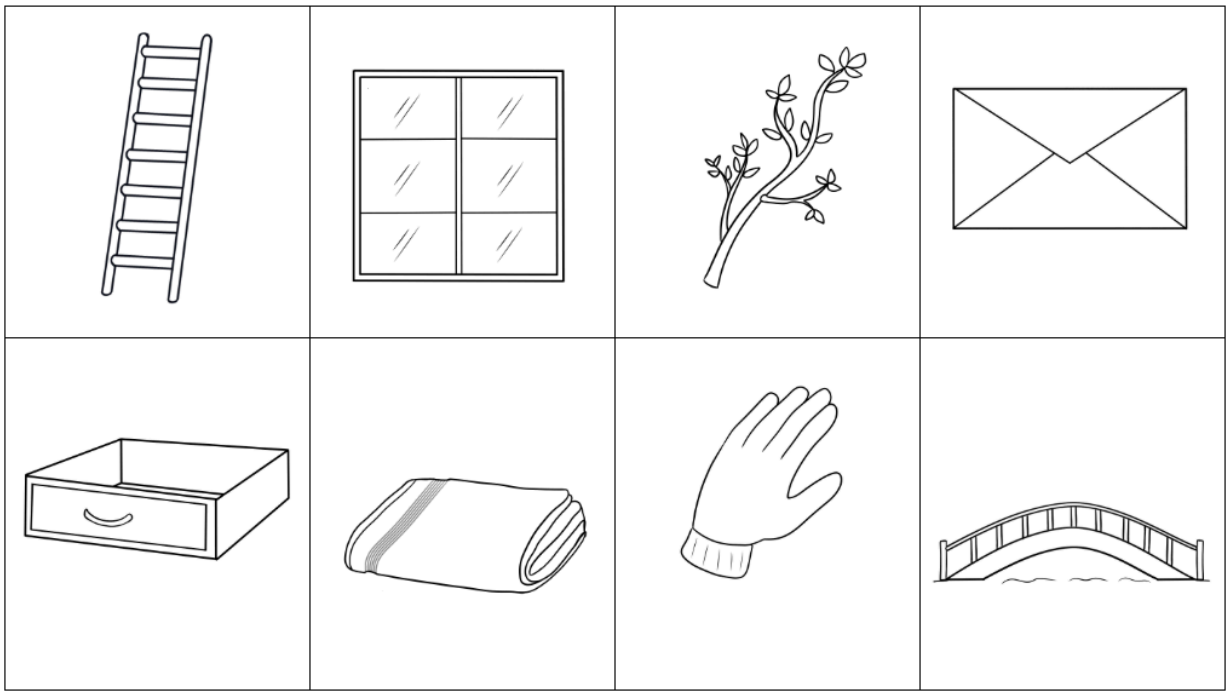
Wammes, Jeffrey D., Melissa E. Meade, and Myra A. Fernandes. 2018. Creating a Recollection-Based Memory Through Drawing. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 44: 5, 734–751.

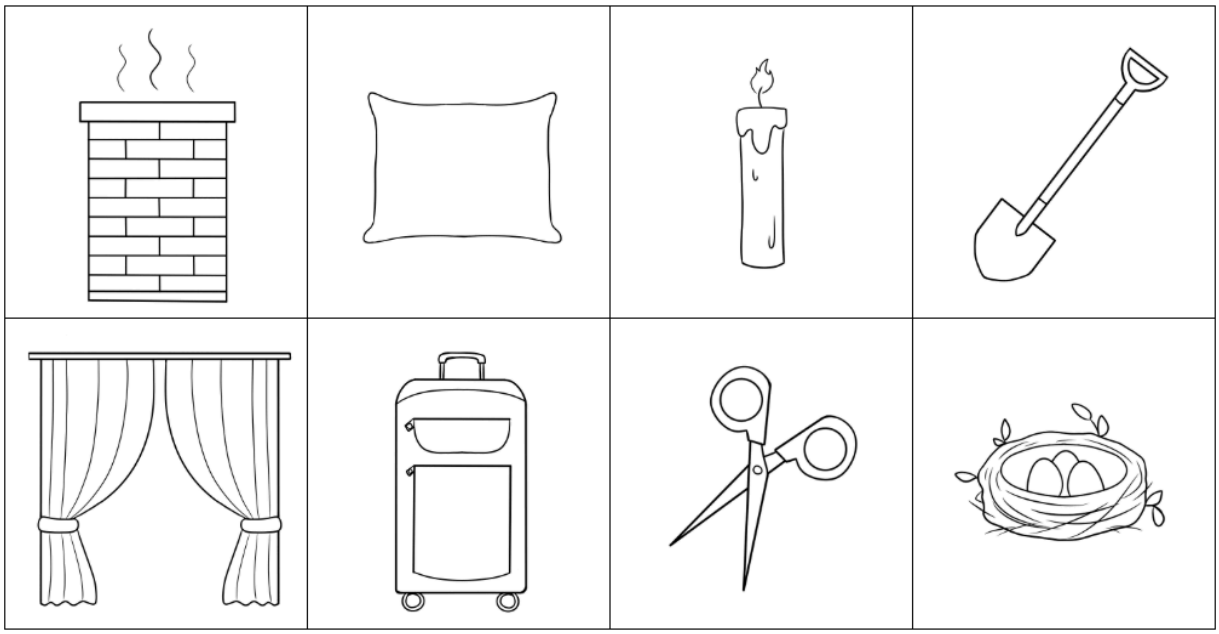
Wilkins, David A. 1972. *Linguistics in Language Teaching*. London: Arnold.

Zeyab, Alaa J. A. M. 2017. *Educational Technology and Visual Literacy: The Effect of Using Doodling on Student Learning Performance*. Dissertation. University of Northern Colorado, Colorado, The United States of America.

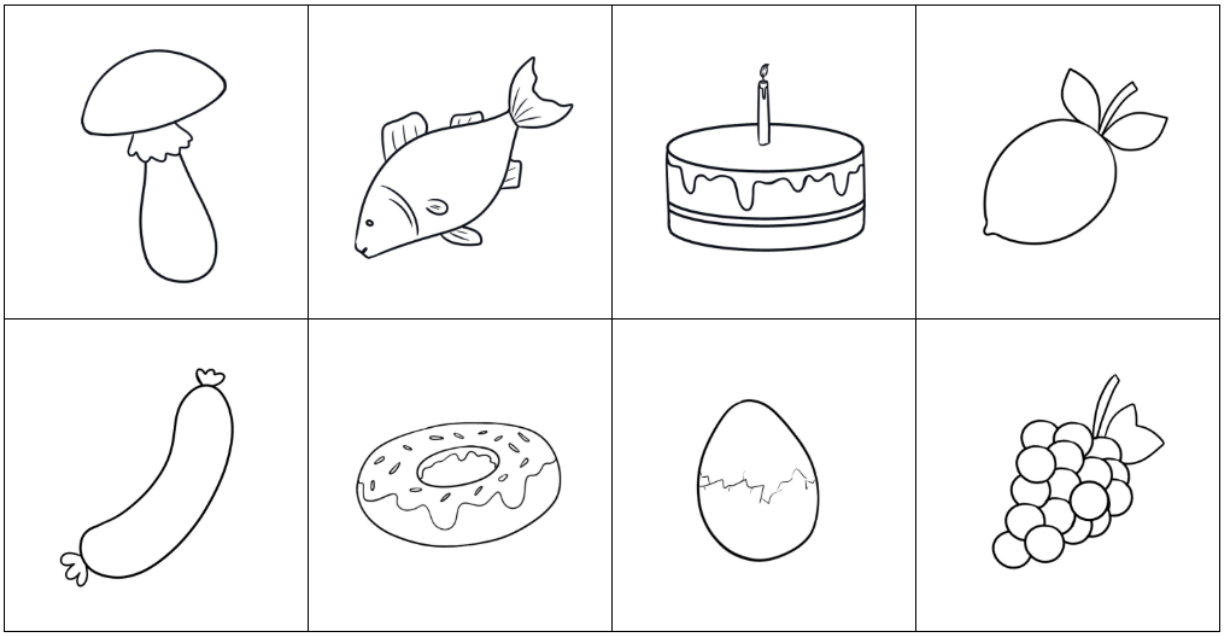
APPENDICES

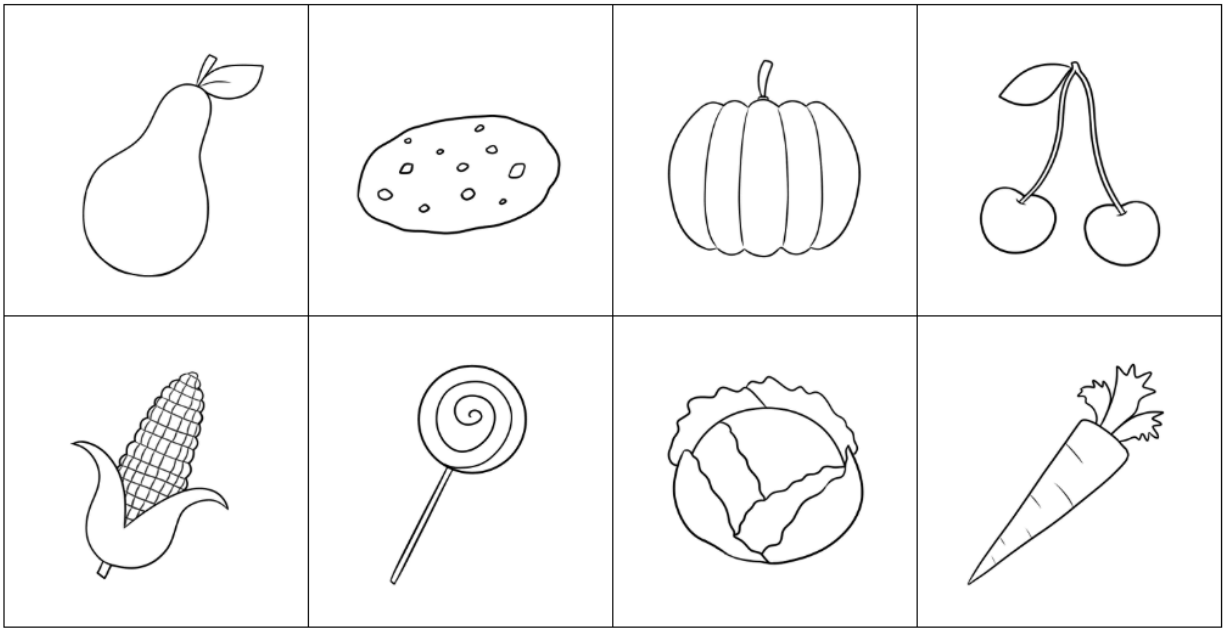
APPENDIX 1 – Pilot study illustrations





APPENDIX 2 – Main study illustrations





APPENDIX 3 – Sample worksheets

3A Drawing condition worksheet (page 1 of 2)

Nimi:

Seen → Mushroom

Write the word in English: _____

Kala → Fish

Write the word in English: _____

Kook → Cake

Write the word in English: _____

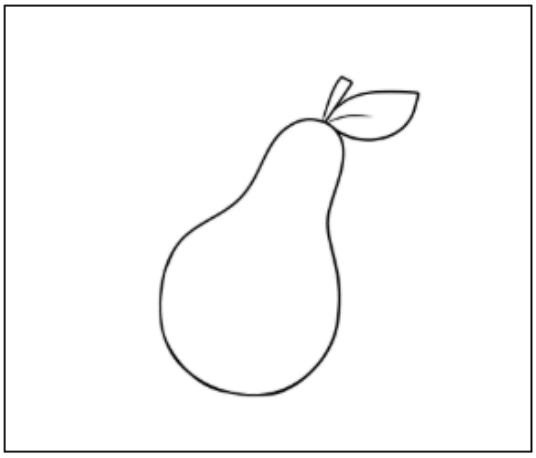
Sidrun → Lemon

Write the word in English: _____

3B Illustration condition worksheet (page 1 of 2)

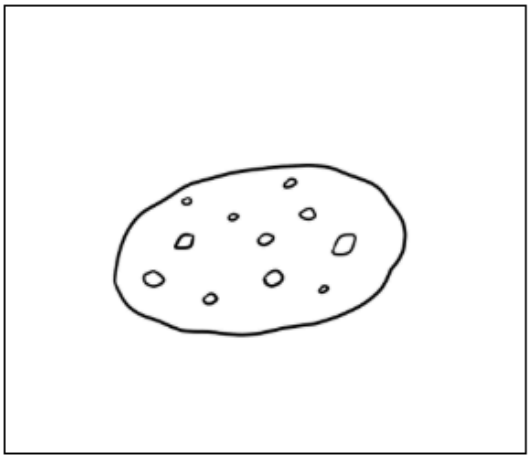
Nimi:

Pirn → Pear



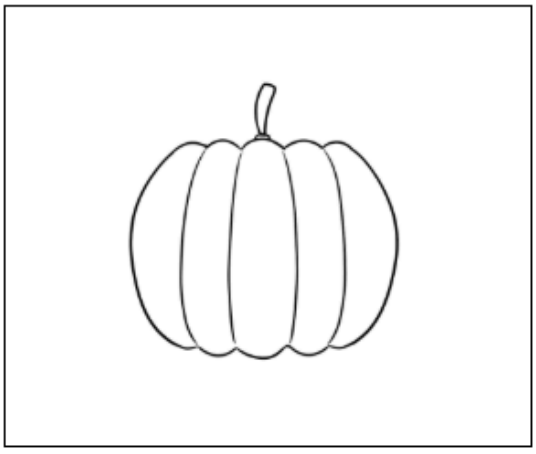
Write the word in English: _____

Küpsis → Cookie



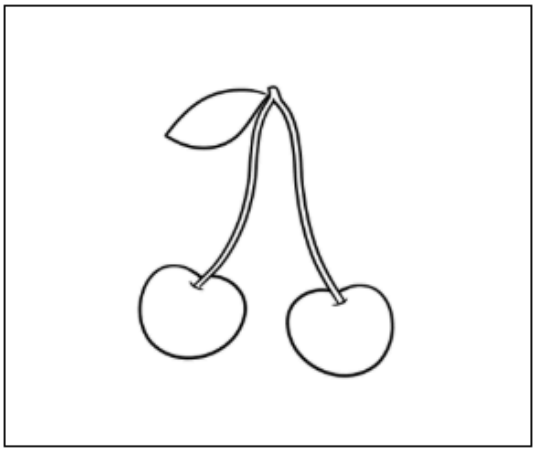
Write the word in English: _____

Kõrvits → Pumpkin



Write the word in English: _____

Kirsid → Cherries



Write the word in English: _____

APPENDIX 4 – Vocabulary tests

4A Pre-/Delayed test

Nimi:_____

Sõna	Ingliskeelne tõlge
Kirsid	
Porgand	
Seen	
Mais	
Kook	
Muna	
Pirn	
Sõõrik	
Kala	
Viinamarjad	
Kõrvits	
Vorst	
Pulgakomm	
Kapsas	
Sidrun	
Küpsis	

4B Sample immediate test

Nimi:

Sõna	**Ingliskeelne tõlge**
Kõrvits	
Kirsid	
Küpsis	
Kapsas	
Pirn	
Porgand	
Pulgakomm	
Mais	

APPENDIX 5 – Questionnaire questions

Q1: Joonistamine aitas mul sõnu paremini meelde jätta. (*Ei nõustu üldse → Nõustun täielikult*)

Q2: Piltide vaatamine aitas mul sõnu paremini meelde jätta. (*Ei nõustu üldse → Nõustun täielikult*)

Q3: Joonistamine nõudis minult rohkem vaimset pingutust kui piltide vaatamine. (*Ei nõustu üldse → Nõustun täielikult*)

Q4: Joonistamine oli minu jaoks kasulik. (*Ei nõustu üldse → Nõustun täielikult*)

Q5: Kasutaksin joonistamist ka tulevikus uute ingliskeelsete sõnade õppimiseks. (*Ei nõustu üldse → Nõustun täielikult*)

Q6: Kuidas Te tavaliselt uusi sõnu õpite?

Q7: Kas joonistamine aitas Teil sõnu meelde jätta? Selgitage, kuidas või miks (mitte).

Q8: Kas Teil on veel kommentaare või tähelepanekuid?

APPENDIX 6 – Number of correct recalls by vocabulary items

Word	Known in pre-test	Drawing immediate	Illustration immediate	Drawing delayed	Illustration delayed
Mushroom	2	3	3	4	3
Fish	8	2	N/A	2	N/A
Cake	5	1	2	2	2
Lemon	4	2	2	2	1
Sausage	1	2	4	0	1
Donut	1	4	4	2	1
Egg	5	4	1	3	0
Grapes	1	5	4	5	2
Pear	1	2	5	1	4
Cookie	2	2	2	0	1
Pumpkin	1	4	4	1	2
Cherries	3	1	4	1	2
Corn	3	2	2	2	2
Lollipop	1	4	4	3	2
Cabbage	1	2	5	1	2
Carrot	1	2	4	2	3

RESÜMEE

TARTU ÜLIKOOL
ANGLISTIKA OSAKOND

Karoliina Anett Kompus
“The effect of learner-generated drawings versus pre-made illustrations on vocabulary retention in adult beginner efl learners” / ”Õppijate loodud joonistuste ja eelnevalt valmistatud illustratsioonide mõju sõnavara meeldejätmisele täiskasvanud algajate inglise keele õppijate seas”
Magistritöö
2026
Lehekülgede arv: 65

Annotatsioon:

Käesoleva magistritöö eesmärk on uurida õppijate endi loodud joonistuste ja etteantud illustratsioonide mõju sõnavara meeldejätmisele täiskasvanud algtasemelt inglise keele õppijate seas. Töös võrreldakse, kumb lähenemine toetab paremini nii kohest kui ka hilisemat sõnavara talletamist. Lisaks analüüsib töö õppijate hoiakuid joonistamise kui õpistrateegia suhtes.

Töö koosneb kolmest peatükist. Esimene peatükk annab ülevaate sõnavarast võõrkeeleõppes ning käsitleb visuaalsete materjalide kasutamise teoreetilisi aluseid ning joonistamist kui õppemeetodit. Teine peatükk kirjeldab uurimuse metoodikat, sealhulgas selle kujundust, materjale ja protseduuri ning uurimuse tulemusi. Kolmas peatükk arutleb tulemuste üle, seob neid varasema uurimistööga ning toob välja selle piirangud ja edasised uurimisvõimalused.

Uurimus viidi läbi kümne täiskasvanud algtasemel inglise keele õppijaga. Osalejad õppisid uuringu jooksul 16 sõna kahes tingimuses: joonistades või vaadeldes etteantud illustratsiooni. Sõnavara omandamist mõõdeti eeltesti, kahe kohese järeltesti ning ühe hilisema järeltesti abil. Lisaks koguti õppijate hoiakuid küsimustiku kaudu.

Tulemused näitasid, et etteantud illustratsioonid toetasid paremini kohest sõnavara meeldejätmist, samas kui joonistamise puhul ei saavutatud kõrgemaid tulemusi vahetult pärast õppimist. Hilisemas järeltestis vähenes aga kahe meetodi tulemuste vahe, kuna illustratsioonide tingimuses toimus suurem soorituse langus. See viitab sellele, et kuigi etteantud illustratsioonid võivad olla tõhusamad esialgse õppimise toetamisel, võib joonistamine soodustada püsivamat meeldejätmist. Küsimustiku tulemused näitasid õppijate hoiakute varieeruvust, tuues esile individuaalsete erinevuste olulise rolli joonistamise kui õpistrateegia tõhususes.

Märksõnad: inglise keel, sõnavara omandamine, mälu, joonistamine, visuaalsed abivahendid, täiskasvanud õppijad.

Lihtlitsents lõputöö reprodutseerimiseks ja lõputöö üldsusele kättesaadavaks tegemiseks

Mina, Karoliina Anett Kompus,

1.annan Tartu Ülikoolile tasuta loa (lihtlitsentsi) enda loodud teose

“The effect of learner-generated drawings versus pre-made illustrations on vocabulary retention in adult beginner efl learners”, mille juhendaja on Jane Padrik,

1.1.reprodutseerimiseks säilitamise ja üldsusele kättesaadavaks tegemise eesmärgil, sealhulgas digitaalarhiivi DSpace-is lisamise eesmärgil kuni autoriõiguse kehtivuse tähtaja lõppemiseni;

1.2.üldsusele kättesaadavaks tegemiseks Tartu Ülikooli veebikeskkonna kaudu, sealhulgas digitaalarhiivi DSpace´i kaudu kuni autoriõiguse kehtivuse tähtaja lõppemiseni.

2. olen teadlik, et punktis 1 nimetatud õigused jäävad alles ka autorile.

3. kinnitan, et lihtlitsentsi andmisega ei rikuta teiste isikute intellektuaalomandi ega isikuandmete kaitse seadusest tulenevaid õigusi.

Karoliina Anett Kompus

Tartus, 11.05.2026

Autorsuse kinnitus

Kinnitan, et olen koostanud käesoleva magistritöö ise ning toonud korrektselt välja teiste autorite panuse. Töö on koostatud lähtudes Tartu Ülikooli maailma keelte ja kultuuride instituudi anglistika osakonna oma õppekava magistritöö juhendist ning on kooskõlas heade akadeemiliste tavadega.

Karoliina Anett Kompus

Tartus, 11.05.2026

Lõputöö on lubatud kaitsmisele.

Jane Padrik

Tartus, 11.05.2026