**RESEARCH ARTICLE**

# Visual Lexicography: Use of Images and Infographics in English Dictionaries

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**Abstract:** Visuals and infographics provide pictorial representation of words used in the dictionaries. This act makes it easy for learners to learn words in best effective way. The aim of the study is to explore what type of visuals and infographics are used in English dictionaries. A qualitative research approach was employed. For sampling, Oxford English Picture Dictionary was selected through purposive sampling method as this dictionary contains many pictures. Dual coding theory was employed as a theoretical framework to explain how images and words work together to give better understanding of words. Thematic analysis was done to analyze data. The findings revealed that images make meanings clear and % of pictures used for nouns in Oxford English Picture Dictionary is comparatively high than pictures used for verbs and adjectives. The study suggests that lexicographers should focus on including more visuals for verbs and adjectives as adjectives are harder to understand.

**Keywords:** Visual Lexicography, Infographics, Pictorial Representation, Oxford English Picture Dictionary

## Introduction

Lexicography is an act of compiling dictionaries. It involves searching for words of a certain language, meanings, current usage of vocabulary, come up with proper definition of words and relevant examples (Hartmann,2001). The concept of lexicography dates back to the ancient civilizations, the Sumerian structures of language was first written on the clay tables to record and deliver it to the people then Greece , China and Indian ancient civilizations followed the same way .The 18th and 19th century is marked for the development of comprehensive dictionaries when Samuel Johnson compiled a comprehensive dictionaries with 42,000 entries which marked as major development in English lexicography (Landau,2001). As technology started to emerge and evolved in 20th and 21st century, lexicographers Incorporated technology within dictionaries. Modern dictionaries are now accessible to everyone and everywhere with just one touch (Atkins & Rundell,2008). Lexicography as a branch of applied linguistics mainly focus of practical and theoretical aspects. Practical aspect involves the compilation of dictionaries however the theoretical aspect analyzes the relation of meanings of words and studies dictionaries (Jackson,2013).  play vital role in language acquisition, developing vocabulary, comprehension of words of any language and also serves as a tool for self-learning. Dictionaries provide the current usage of words, list of synonyms, relevant examples for further comprehension of vocabulary.

## Visual Lexicography

Visual lexicography involves the integration of visual elements for example pictures, info-graphics into dictionaries to improve understanding of words, words usage and to show the culture of a specific language as well. The pictorial definition of words forms an aid in developing vocabulary learning among bilingual learners. Visuals lexicography plays a crucial role in promoting language learning by offering learners visual aids to construct the abstract and unfamiliar meaning of words. Some of the vocabularies are best learned by learners seeing the vivid images of the items. For example, images of animals, day-by-day usage items

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and equipment in a dictionary aid better learning compared to learning words alone. Info-graphics and photographs used in dictionaries create a solid imprint of vocabularies to the minds of children learning a specific language or learning a foreign language. When visuals are provided in the dictionaries, learners of diverse culture can also learn vocabularies effectively with the help of visuals.

### Research Questions
This research follows these questions:
1. What type of visuals and info-graphics are incorporated in English dictionaries?
2. How frequently are images used for nouns, verbs, and adjectives in the selected dictionary?

### Objectives
The main objectives of this study are given below:
1. To investigate what type of visuals and info-graphics are used in English dictionaries.
2. To explore the extent of images are used for nouns, verbs, and adjectives in the selected dictionary.

## Review of Literature
### Introduction to Lexicography
Lexicography is an art of compiling, writing, and editing dictionaries of a given language. The act of lexicography includes collecting words that are being used by the speakers of a given language, defining the words with proper examples for more detailed understanding and documenting the current usage based on linguistic data. Bejoint (2010) highlighted a shift in perspective from vocabulary-need for language to user-centered approach by conducting a detailed historical analysis of English dictionaries. The study follows descriptive methodology to understand the shift in lexicography by carefully investigating various editions of dictionaries and their prefaces. This study emphasized that modern dictionaries must acknowledge learner's needs.

Dictionaries serve as excellent tool for language learner, translators, teachers, and general public. Dictionaries of any language contain vocabulary, grammatical information, current usage of words with examples. Dictionaries are of several types, there are bilingual dictionaries, monolingual dictionaries. Learner oriented dictionaries are also available that particularly focus on age of learners. These dictionaries contain synonyms, examples of vocabularies based on learners age (Landau,2001).

### Emergence of Visual Lexicography
With the advancement in technology the use of visual dictionaries has become prevalent, particularly within the contents made for young language learners and second language learners. Tarp (2008) pinpointed the concept of functional lexicography. By using a theoretical frame-work he analyzed how learning can be made more effective by incorporating visual elements in dictionaries. Vocabularies can better learn by seeing the actual images of objects. Tarp's analysis advocated a way for the dictionaries that serve specific user function. His work included critical review of lexicographical theories and dictionaries to put forward a model for integrating visual elements in dictionaries.

### Theoretical Framework
Dual Coding Theory was introduced by Paivio in 1971. The aim of the study was to interpret how humans learn words and remember information particularly when words are combined with visuals (dual coding). Paivio followed qualitative approach and collected data with controlled lab experiments. Participants were of different age. Some were college going students and some were preschool and elementary school going children. He designed lab experiments to learn how people learn words, word pairs, concrete and abstract ideas. The findings highlighted that content presented in the form of verbal and visual have lasting effect comparative to the information that's being presented in verbal form only. The study suggested that

integrating visual elements can be effective for long lasting learning. Just like Paivio, Mayer (2009) conducted lab-based experiments on students. Some students were exposed to only words and some were exposed to both visuals and verbal elements. The findings revealed that students who were exposed to visual with words performed much better in comprehensive test than of those who were exposed to words only.

## Visuals in English Dictionaries

Using visual tools, such as the use of pictures, imagery, icons and infographics has been a well-recognized factor that can aid in the process of using dictionaries and learning vocabulary. Lew (2010) suggests that multimodal lexicography where visual and text data are used enhance the cognition of the meaning of words and more so concrete nouns as the cognitive load is reduced. It is proved that learners are more likely to process visual representations more quickly than text definitions, which can facilitate second language acquisition understanding (Dziemianko, 2015). Due to the eye-tracking research provided by Lew, Kazmierczak, Tomczak, and Leszkowicz (2018), it was found out that when pictorial illustrations are given in a dictionary, the attention of dictionary users is distributed differently; visual representation hastens the process of recognizing the meaning of words and helps to disambiguate the meaning of the word. These results support the theory of Dual Coding which states that information that is placed in both pictures and languages has higher chances of remaining in the memory (Paivio, 1991).

Also, studies of vocabulary acquisition in multimedia presentations show that the use of text together with images can benefit the level of engagement and learning in the learner (Yoshii and Flaitz, 2002; Mayer, 2009). Illustrations help learners not only to make sense but, given the nature of context or culture that the text might not capture, it gives them a contextual or cultural background (Kress and van Leeuwen, 2006). In general, these studies draw attention to the pedagogical significance of visualization of English dictionaries to facilitate the process of vocabulary learning and to improve comprehension and understanding by the user.

## Visuals in Urdu Dictionaries

According to cross-linguistic studies, it is not always the case that pictorial representation is always present throughout the dictionaries of various languages. As an illustration, most English language learner dictionaries consistently provide a more picturesque and infographical presentation, yet other languages with less resources, even those less spoken, do not tend to employ visuals in their description (Dziemianko, 2015). It has been shown that adding pictures to the text of the dictionary entries increases the rate of retaining words and bridging the gaps in the referential memory as well as transmitting the cultural information (Lew et al., 2018; Yoshii and Flaitz, 2002). The concept that bilingual or multilingual dictionaries might be facilitated by illustrations is further enhanced by Dual Coding Theory (Paivio, 1991) provided the previous knowledge or cultural background of learners is less advanced. Pictorial representations are semiotic aids that supplement verbal definitions and enable learners to learn through intuition in how to understand the definitions. Decoding and attractive visual entries are therefore future direction of dictionaries especially in the teaching situations where understanding and retention of vocabularies are the priorities.

## Previous Studies

A study conducted by Lilian Atieno Gangla (2004) aimed to examine the effectiveness and value of pictorial illustrations in dictionaries, specifically in depicting and defining cultural elements in African language dictionaries. The research follows deductive method, drawing conclusion on existing literature related to pictorial illustration field. Due to limited illustration in dictionaries the examples are sourced from different places. The data was collected through dictionary survey to investigate the use of pictorial illustrations, to determine which objects are illustrated if any pattern exist. Forty-five dictionaries were included in the survey and dictionaries in the survey were English, Afrikaans, and African language dictionaries. These dictionaries were available at Merensky Library and the Department of African Language at the University of Pretoria.

The English and Afrikaans dictionaries were compared to learn the differences and similarities of illustrated objects and then further to compare with African language dictionaries. The findings of study reveal that words learned with the aid of both images and verbal forms are being better learned comparative to verbal forms only. The pictorial illustrations enhance learning and retention of words seems easy when learned through images. The study also supports Dual Coding Hypothesis proposed by Allan Paivio (1971). The study also highlights the importance of considering the viewer's prior knowledge and cultural context when using illustrations to avoid misinterpretation. Furthermore, illustrations can effectively compensate for lexical or referential gaps, particularly in bilingual dictionaries, and are valuable in conveying cultural information.

The study by Biesaga (2018) aimed to systematize theoretical knowledge on pictorial illustration of dictionaries and provide lexicographers and scientists with a practical overview to apply visual materials to their studies. The research method is to collect scattered information regarding pictorial illustration of lexicography to present a helpful overview. The researcher wants to solve the problem of electronic dictionaries applying pictorial illustration with difficulty, particularly during the Internet period, by summarizing information of applied value.

The paper has examined the difference between dictionaries and encyclopedias, user studies, verbal and visual modes in lexicography, target meanings in illustration, illustration strategies and general principles to pictorial illustration in dictionaries. It touches also on the symbiosis between verbal and pictorial facilities, in support of a coherent entity in which the defining of verbal facilities is aided by visual means. According to user studies, when a dictionary provides tools to explain meaning both verbally and pictorially, users, especially language learners, make use of that tool and the result is an increase in meaning retention. Other areas of the research are the different features of visual representation, including drawings, photographs, animations, and video clips, and their effectiveness in expressing various kinds of information. As an example, idealized objects are thought to be effectively represented by drawings whereas non-idealized objects, i.e., individual objects, are best represented by photos. Application of color in illustrations is also addressed in which, it may be a necessity to some of the entries such as blueberry and cranberry where the color distinction is paramount. The paper concludes its research by advising that more work should be done on semantic relations, cultural diversities and development of graphical resource databases to improve pictorial representation in lexicography.

Sharif(2012) investigated the application of picture dictionaries in Bangladesh, gain insight into how parents, caregivers and educators perceived its impacts, and how they envisaged high quality picture dictionaries. The study adopts a descriptive, cross-sectional study design to explain the use of picture dictionaries in various places like homes, schools, and day care centers with children in infancy up to primary grades.

Data collection was done in a number of ways. To evaluate the status of the use of picture dictionary, documents, such as existing curricula, were observed. Parents, caregivers, teachers, and educators participated in in-depth interviews and provided information, as well as their perceptions. Naturalistic observations and video-recordings were conducted in houses, day cares, and classes in pre-primary in order to observe the use of picture dictionaries and measure the interest and adult role of children. Twenty parents who were selected purposely to take part in the study (ten who illustrated picture dictionaries and ten who did not), three caregivers, two preschool teachers, two experienced educators, and five children aged between 33 months, and seven years participated in the study. Such data collection tools comprised guiding questions, probe questions in case of interviews, and observation checklist. This research established that picture dictionaries were not easily offered to children before two years because parents were of the view that children were not ready. Picture dictionaries were not readily available in day care centers because of the damage fears. Parents who employed picture dictionaries felt that there was an enhancement of early language growth, acquisition of knowledge, increased vocabulary, and better book love in their children. The

study outlines the possible advantages of picture dictionaries in their proper usage and the necessity of more awareness and knowledge on how to use them properly.

The research of Wahyudi (2022) aimed to the purpose of studying the effectiveness of infographics in learning vocabulary among eighth-grade students studying at MTs YPI Buay Madang Timur in the 2021/2022 academic year. The research was aimed at resolving the issue of vocabulary deficiency among the students through the application of infographics as a visual representation to boost the knowledge of vocabulary. The study used a quantitative and quasi-experimental research design. The sample also included all eighth-grade students of YPI Buay Madang, but the sample was chosen through a cluster random sampling process, and two classes VT B and D were utilized in the study. Multiple-choice questions (50 items) were used to collect data as vocabulary mastery after validation. Spreadsheet-powered computers were used to analyze the data to establish the meaningfulness of the infographic intervention. The research process consisted of pre-and post-testing both the experimental and control groups

to measure the vocabulary acquisition. The intervention implied teaching the vocabulary by means of infographics to the experimental group and the teaching by traditional teaching methods to the control group. The comparability of the pre-tests and post-tests results of the two groups determined the effectiveness of the infographic. The result showed that there was a significant difference between the experimental and control groups. The large value (P-value) is 0.002, which is not equal to 0.05 (alpha), and the null hypothesis was rejected and the alternative hypothesis accepted. It implies that the application of infographics in teaching vocabulary was efficient among the eighth-grade students in 2021/2022 at the academic years of the MTs YPI Buay Madang Timur. The researchers came to the conclusion that infographics might be used in teaching vocabulary by means of offering students a well-illustrated and comprehensible medium.

The thesis of Leivemaa (2017) focused on the role of animation in digital learning resources, that is, the movement of drawings, graphics, schemes, graphs, or maps, it does not include live video. The key point is to prove the worth of animation as the means of supplementing the digital learning, showing that it is worth investing in. The research paper follows a qualitative methodology and is aware of the difficulty in accurately measuring the time, effort and effect of animation on sales and learning process as opposed to stagnant pictures. It is aimed at demonstrating that the movement is good in educational infographics, which might contribute to their further application in the future.

No firm information about data collection and sampling is given, the thesis also points out that it is hard to estimate how much time and effort would go into each animation as well as the effect of each animation on sales and learning. Platforms, restrictions, or programs peculiarities are not stressed since they change very fast. The company has a small visual design department and few resources to utilize currently. The research objectives are findings that are general and not just limited to the case and client in the study but can also be relevant in the future. The thesis focuses on animation as the fastest, simplest, and most effective to utilize the powers of digital learning material. The analysis does not dwell upon sounds and voiceovers of the animations as they fall under another department.

The research paper by Maritha (2017) explores the efficacy of the pictures in enhancing mastery of English vocabulary among 3 rd grade students. The study was conducted at SDN Karawang Kulon II and engaged 21 students and relied on the mixed-method methodology of data collection, including both quantitative and qualitative methods.

The action research cycles by Ferrance were applied in the research design, which involved planning, acting, observing and reflecting. The pre-tests and post-tests were used to determine vocabulary improvement; questionnaires were used to capture the perception of students and observation notes were

done to capture dynamics of the classroom and the researcher performance. The entire sample was a total of 21 students in the third grade.

Descriptive statistics were used to analyze the quantitative data of the tests, and the qualitative data of questionnaires and observations were analyzed thematically. The results showed that there was a substantial positive change in vocabulary mastery among the students who were receiving pictures-based intervention. The average score during the pre-test was 56.19 that rose to 81.90 during the post-test I and 94.29 during post-test II. According to the results of the questionnaires, the majority of students were excited about the idea of learning vocabulary with pictures and believed that their vocabulary got better. The observations recorded by Observer revealed that the competency of the teacher, student interaction and classroom environment improved. The research finds that the pictures may be a good tool of learning new words in English.

## Research Gap
Given the significance of visual representation in dictionaries, the English dictionaries are well represented in terms of images and info-graphics. Existing studies focus on the importance of visuals in vocabulary learning but little attention has been given to the distribution of visuals and infographics across different word classes in picture dictionaries particularly Oxford English Picture Dictionary. This study addresses this gap by analyzing the thematic and lexical use of visuals in an English picture dictionary.

## Methodology
This research uses a qualitative and descriptive research design to explore the application of visual elements, namely images and infographics in English dictionary, the selected dictionary. The research purpose is to examine the form of visuals and infographics used in English dictionaries to help users get a better idea of a concept and to learn vocabulary effectively. This research follows qualitative and descriptive research design to investigate what sorts of visuals are used in both English and Urdu dictionaries and how images are distributed across verbs, nouns, and adjectives.

## Research Design
A qualitative approach was selected due to the interpretive nature of the study. The research is descriptive in the sense that it examines how visual elements are presented within the dictionary. The study incorporates dual coding theory to analyze the visuals and infographics used in the dictionary.

## Data Collection
A purposive sampling method was used to select dictionary that includes visual content such as images, illustrations, diagrams, and infographics. This study uses the Oxford English Picture dictionary as a sample for research. The dictionary provides high quality visuals to the language learners.  Dictionary was carefully selected based on availability, popularity, and the presence of visual components. Both printed and online versions were considered.

## Data Analysis
Oxford English Picture Dictionary
Total Entries: 200

**Table 1**

*The Themes of the Pictures*

| Lexical Themes | Word | Dictionary | Word Class | Description of Image |
|---|---|---|---|---|
| Family & People | Mother, father, sister, brother, grandmother, grandfather, aunt, uncle, cousin, baby, child, teenager, adult, Friend, neighbor, man, woman, boy, girl, parent | Oxford English Dictionary | Noun | The family and people theme contains vocabulary like mother, father, aunt, uncle etc. These words are concrete because they refer to real people. Illustration showing people performing some activities. |
| School & Classroom | teacher, student, desk, chair, pencil, eraser, ruler notebook, textbook, blackboard, marker, backpack, classroom, library, computer, projector, whiteboard, homework, lesson, test | Oxford English Dictionary | Noun | The school and classroom theme contains vocabulary like teacher, students, test, homework etc. some words are concrete some are abstract. Illustrations are to the point showing students and teachers working. |
| Food & Drinks | apple, banana, orange, bread, rice, egg, chicken, fish, milk, tea, water, juice, vegetables, carrot, Potato, tomato, sugar, salt, butter, cheese | Oxford English Dictionary | Noun | The food and Drinks theme contains vocabularies like apple, rice, milk, and juice etc. These words are concrete nouns as they refer to tangible items. Illustrations for particularly this theme show one picture of each food item. |
| Animals & Nature | dog, cat, cow, goat, horse, bird, fish, lion, tiger, elephant, tree, Flower, Leaf, mountain, river, sea, sky, rain, sun, wind | Oxford English Dictionary | Noun | The Animals and Nature theme contain vocabularies like dog, fish, tree, wind, and river etc. Mostly words are concrete. While river and wind are semi concrete. Illustrations of this theme are usually depicted in recognizable context. |
| Occupations | Doctor, Nurse, Teacher, Engineer, Driver, Farmer, Police officer, Firefighter, Chef, Waiter, Barber, Tailor, Cleaner, Mechanic, Shopkeeper, Cashier, Guard, Plumber, Electrician, Carpenter | Oxford English Dictionary | Noun | The Occupation theme contains vocabulary like doctor, police, barber, and guard etc. All words are concrete nouns. Illustrations of this theme show images of people wearing job related attire. |

| Household Objects | bed, pillow, blanket, table, chair, sofa, lamp, fan, clock, mirror, refrigerator, stove,  spoon, plate, cup, door, window, broom, bucket, towel | Oxford English Dictionary | Noun | The theme of Household objects contains vocabulary like bed, door, towel, and sofa. All words are concrete nouns. Illustrations of this theme show pictures of objects used in household. |
|---|---|---|---|---|
| Actions & Verbs |  eat, drink, sleep, walk, run, talk, listen, read, write, cook, clean, wash open, close, sit, stand, jump, smile, cry, play | | Verb | The Action and Verbs contain vocabularies the represent common actions performed by people, animals, or objects. Illustration in this theme usually depicts an action being performed by someone or something. |
| Adjectives | Short, long , clean, small, big, new, old, dark, hot, cold, windy, high, | Oxford English Dictionary | Adjective | The adjective theme contains vocabularies that describe feelings, qualities, or state of things or people. Most of the words under this theme are abstract. Illustration in this theme shows people's, or animal's quality or emotions. |
| Transportation | Car, bus, train, bicycle, airplane, motorbike, truck, taxi, boat, ship, road, bridge, station, airport, traffic light, fuel, tire, engine, driver, passenger | Oxford English Dictionary | Noun | The Transportation theme includes vocabulary like car, ship, light, and driver etc. All words are concrete as they refer to some objects. Illustration in this theme usually shows one picture of each object in recognizable context. |
| Health & Medicine | Hospital, clinic, doctor, nurse, patient, medicine, pill, injection, operation, bandage, thermometer, fever, cough, cold, pain, injury, ambulance, blood pressure, stethoscope, mask | Oxford English Dictionary | | The Health and Medicine theme contains vocabularies related to human body, human health conditions and care. Most words are concrete, some words like pain and illness are abstract. Illustrations in this theme clearly depict the health-related concept in action. |

## Oxford English Picture Dictionary
Total Entries: 200

## Table 2
*The percentage of the word class*

| Word type | Numbers of entries | %age |
|---|---|---|
| Noun | 152 | 76% |
| Verb | 36 | 18% |
| Adjective | 12 | 6% |

## Description of Table No: 1
The description of Table No: 1 is given below. All the themes are discussed one by one. The images inserted in this study are taken from The New Oxford Picture Dictionary, Monolingual. Some of the illustrations are paired together in one image however some words are not included in the themes.

## Theme of Family & People
Family and People theme deals with the vocabulary about family relations and social relations that include mother, father, sister, brother, grandmother, and grandfather. Most of them are concrete nouns because they represent real people whom the learner has seen and interacted with. Some words like friend or parent are partially abstract since they are describing the relation between people rather than a physical object.

## Figure 1
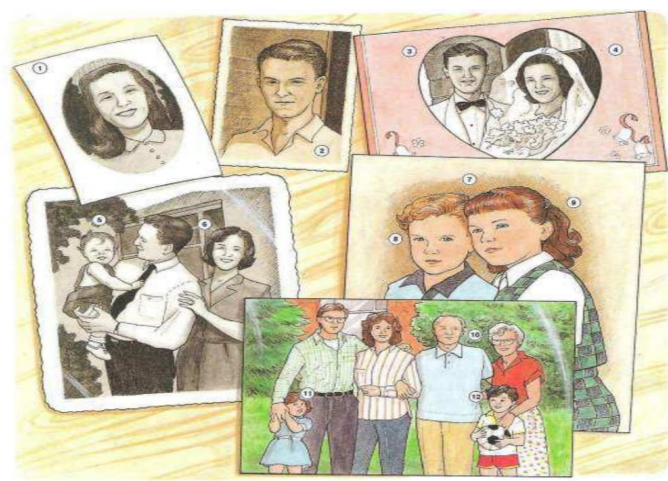


Illustrations in this type of theme usually portray a person performing a common activity. For instance, mother holding a baby, grandfather walking with a cane, or friend smiling and talking with another person. The visuals are generally uncomplicated and easy to understand since they focus on one or two people, which is why learners find it very easy to link the word to its meaning.

The dual coding effect is strong in this theme, as a word and a picture together strongly enforce understanding. This theme helps the learner to create an understanding of social roles and family relations and gives them foundational understanding to talk about people and relationships in daily life.

## School & Classroom
School and classroom theme deals with vocabulary like classroom, teacher, students, book, pencil, test, homework, and lesson etc. Most of the words for instance, teacher, students, book, pencil are concrete nouns as they represent real people and physical objects. Some of the words like test, lesson and homework are abstract nouns as they refer to concepts rather than any physical objects.

**Figure 2**
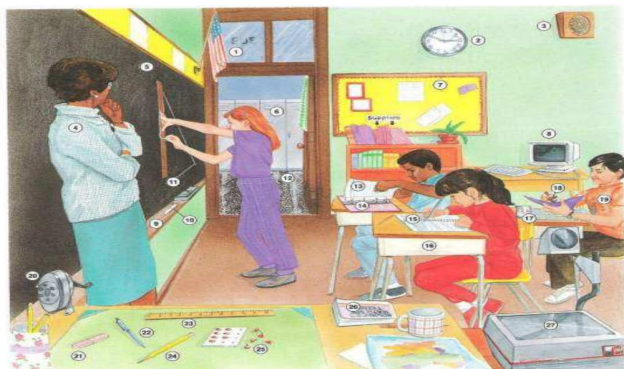


Illustrations in this type of theme are simple and show the teacher and students performing class activities and actions. For example, teacher is depicted as writing something on the blackboard and some students looking at the blackboard some writing on their notebooks. Other objects like books and pencils are simply shown and placed on the desk. The visuals in this theme are kept simple to help the language learners to learn meaning of words effectively by connecting words with real objects.

The dual coding effect can be identified by looking at the visual representations of the words. Abstract nouns in this theme are supported by contextual visuals such as students doing homework or taking tests in the classroom. Dual coding refers to how visuals and info-graphics aid in vocabulary learning and vocabulary retention.

**Food & Drinks**

Food and drink theme contain vocabulary related to the edible items and things that we use or consume every day. The words like apple banana, mango, pear, milk and tea all are concrete nouns as they refer to real and tangible items that leaners can feel them by touching or tasting them. These words are highly used in daily life and it's essential for language learners to learn them. The following picture is a reference of how food is illustrated in The New Oxford Picture Dictionary, however some of the visuals aren't presented in this picture.

**Figure 3**
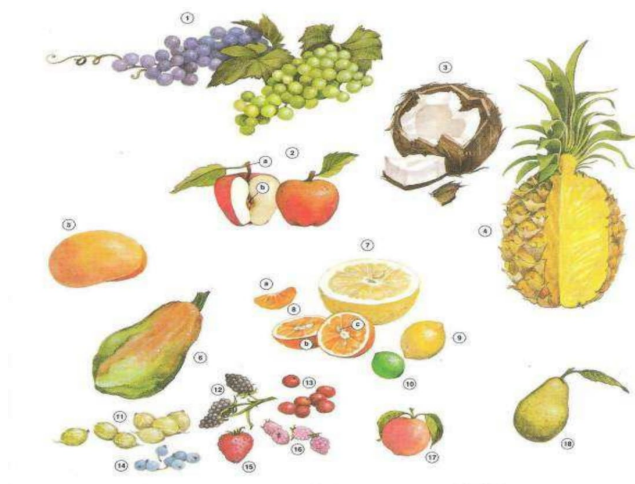


The illustration in this typically shows food items usually placed on a plate. Some visuals show only one food item, some show more than one food item in the scene like salad, rice and vegetables. The visuals are kept simple and direct to give visual representation of the words to the learner, so they learn in the best way possible.

The dual coding effect is strong in this theme because the connection of words with images forces more effective comprehension, particularly for the concrete nouns. Abstract nouns are less likely to be included in this theme as most items linked with this theme are physical and visible.

## Animals & Nature

Animal and nature theme includes vocabulary about animals, plants and natural things. Vocabulary like cat, dog, fox, tiger, rain, river, and lion are included. Most of the words in this theme are concrete as they refer to real and visible objects or entities. Some words like wind and rain come under the category of partially abstracts things.

## Figure 4
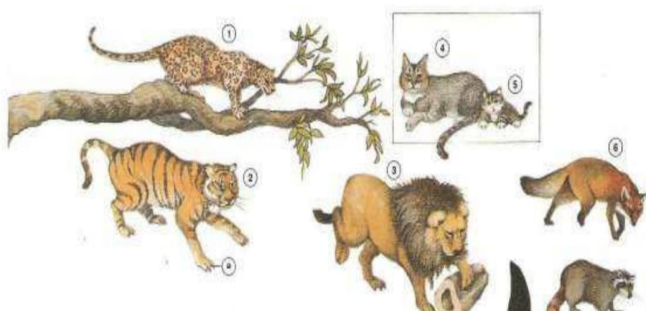


The illustrations of this theme show one picture of one animal at a time like a lion, a tree, or a flowing river etc. The visual representation of words is kept simple and easy to understand so that learners can get an idea of real image of the words they learn and combining pictures with verbal content provides effective learning. This act explains the dual coding effect.

## Occupation

The occupation theme includes vocabulary related to jobs and professions. Vocabulary such as doctor, nurse, teacher, engineer, driver and chef etc. come under the occupation theme. The words under this theme are mostly concrete nouns as they refer to the real people doing the job or people who have some profession.

## Figure 5



The visual representations of words in this theme usually show people doing the job. For example a doctor is depicted as examining a patient, a teacher as writing something on blackboard, or a chef cooking. The images are kept simple and clear, focusing on the person performing the job with tools. This way learners will be able to understand both the job and what tools are used to perform certain jobs.

**Figure 6**
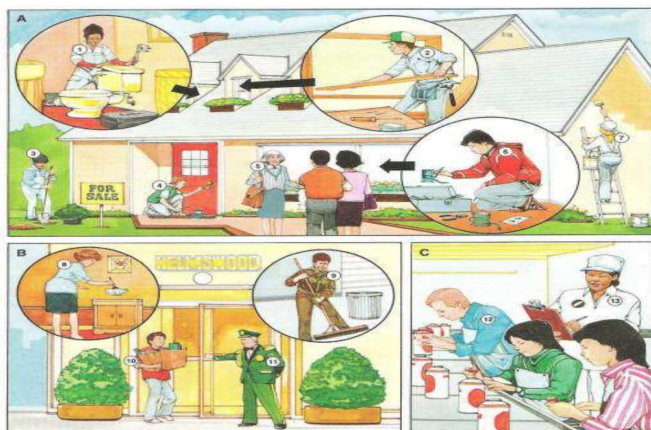


Dual Coding works well here as the images provide a visual picture of person performing jobs so the learners will learn the word more effectively as pictures help learners remember the word. This theme also shows cultural and social roles by illustrating which job is socially acceptable for which gender of the society.

### Household Objects

The household objects theme consists of common vocabulary for things or objects that we use at home. For example bed, pillow, blanket, table, chair, sofa, and clock etc. The words under this theme are mostly concrete as they refer to real or physical objects. The following images contain some visuals that are presented in the dictionary.

**Figure 7**



The pictures in this theme usually show each object where it is found like a bed is shown in a bedroom, table is shown beside the chairs. The pictures in this theme are simple focusing on the main item. Presenting words with images and graphics makes learning easy for the learners.

Dual Coding theory works well here because these items are easy to show in pictures. When a learner views a fan or a refrigerator, he can easily understand the word. The images with words together make learning easier and help with the memory.

### Action & Verbs

The action and verbs theme includes words that describe things that people do. For example, eat, drink, sleep, walk, jump, hit, and talk etc. These words are presented with pictorial representations where people are performing these actions and different kinds of movements and activities.

**Figure 8**
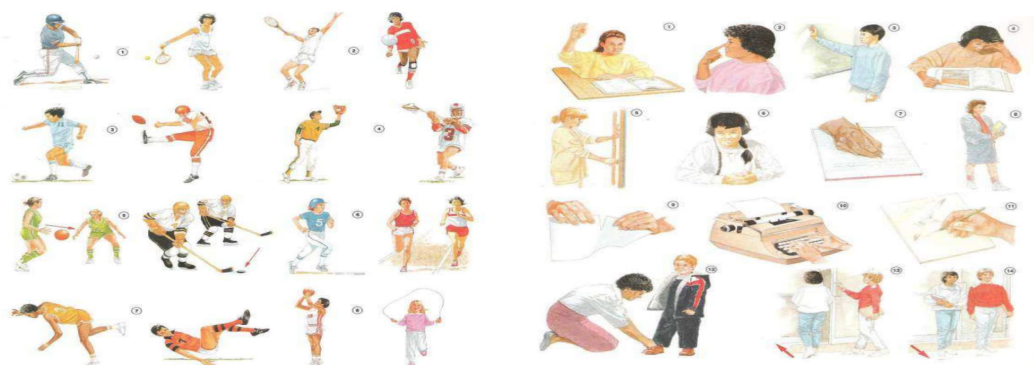


The above images and illustrations are taken from The New Oxford Picture Dictionary, Monolingual. These images are added to give a view on how illustrations are depicted, however some of the action verbs are not included in the word list of the theme.

The pictures for this theme usually show a person perming some action such as someone reading a book, a child jumping. The images clearly focus on the main action itself. This help learners easily understand what each verb means by directly looking at the pictures presented with the words. Dual Coding works well in this theme because actions are easier to learn when we can see them happening. When learners see someone walking or eating in a picture, they can quickly connect the word with the action.

## Adjectives

The adjectives theme includes words that describe feelings, conditions, or qualities of people and things. Words such as small, big, long or short describe the physical state of things. Other words such as big/small, tall/short, hot/cold describe what someone or something looks like or how they feel. The following visuals are directly taken from The New Oxford Picture Dictionary, Monolingual. Some of the vocabularies are not added to the theme list. The insertion of the visuals are to show how adjectives are depicted in the dictionary to help the learners to learn vocabulary effectively.

**Figure 9**
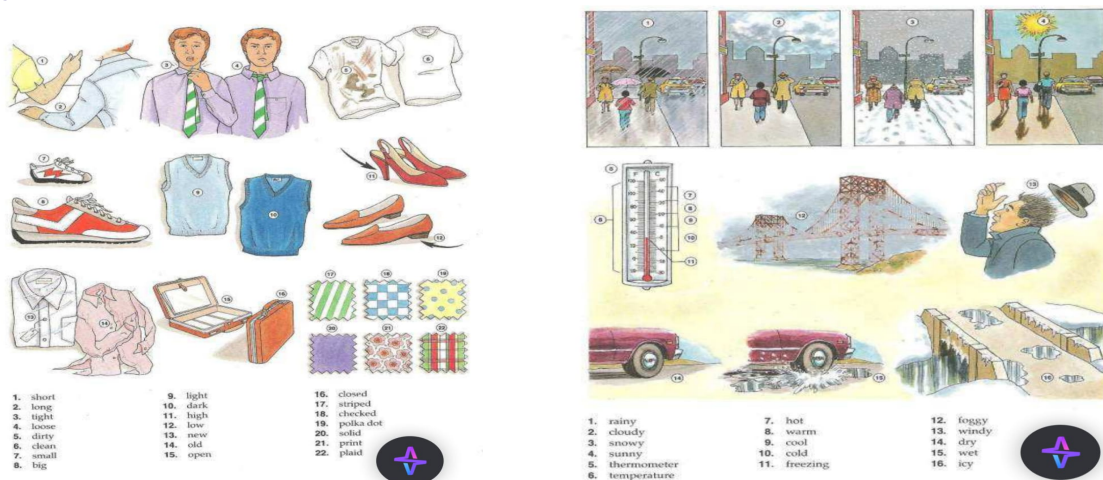


The pictures in this theme usually show how something looks like, for example the small size of let's say a dress is shown with the comparison of a dress that's long.

Visuals are simple and focused on the features Dual Coding is effective here because feelings and qualities or state can be better perceived when depicted in terms of expressions or in simple scenes. The word coupled with pictures assists the learners to memorize the vocabulary. As most of these emotions and descriptions are universal, they can be easily applied by a learner to life and their personal experiences.

## Transportation

Transportation theme includes words that deal with cars, modes of transport, movement within and without a given area. Car, bus, bicycle, train, airplane, boat will be included. Majority of these words are concrete nouns because they are tangible items which can be seen, touched, or used by learners. Other words, such as travel or journey are abstract in that, they describe something which is done or carried out but not a physical thing. The following image and illustrations are taken from The New Oxford Picture Dictionary, Monolingual.

## Figure 10
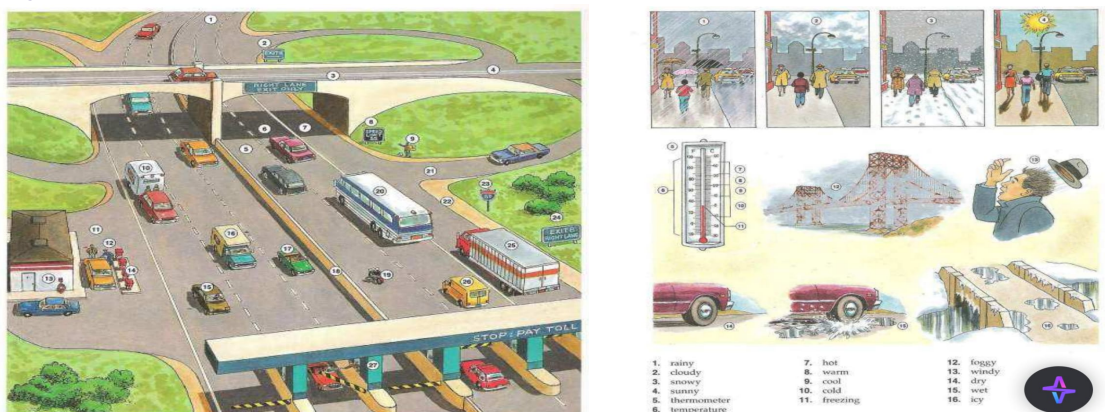


The illustrations in this theme normally depict the vehicle or means of transportation in action or scenario. As an example, one can draw car, which appears on the road, bicycle with a man on its, or airplane in the sky. The graphics are mostly straightforward and direct, centered on the central object or activity, and thus, the learners can easily relate the word and the meaning.

This theme has a high level of dual coding effect since it allows learners to view a word and a visual image of the word. Such concrete nouns as bus or train are strengthened to the maximum with images whereas abstract notions such as travel are reinforced with visuals in context that presents movement or a journey. The theme will assist the learners to speak about transportation, traveling, as well as daily mobility in real cases.

## Health and Medicine

The theme of Health and Medicine contains words that have a connection with the human body, conditions of health and medical treatment. Doctor, nurse, hospital, medicine, fever, pain and injury are some of the words used. These words are mainly concrete nouns that are those words that describe people, objects, or places that can be observed or touched, and other words such as pain or illness are abstract in that they describe an experience or a condition that cannot be directly perceived. The following image and illustration are taken from The New Oxford Picture Dictionary, Monolingual.

## Figure 10
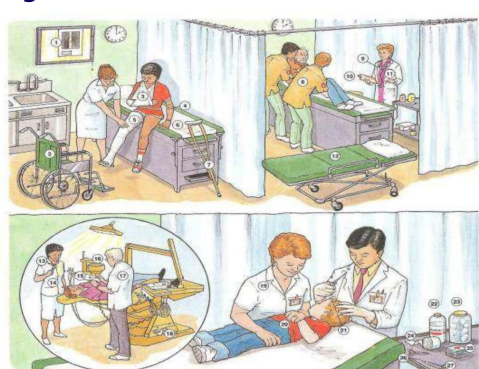
Examples in this theme usually depict the concept of health related to action. As an example, doctor could be depicted with a patient, hospital as a kind of building which has the medical personnel, medicine as pills or a fluid in a bottle. Abstract ideas such as pain are usually depicted through the expression of a person holding the part of his/her body with a facial expression. The images tend to be very plain and concentrated, and it is easy for learners to associate the word and its meaning.

The effect of dual coding is high in this theme since pictures support the meaning of both concrete and abstract words. The significance of this theme in language learning is that it educates the learner on words that he/she would need when talking about health, medical care, and well-being.

### Description of Table No: 2
The table no:2 shows the number and percentage of nouns, verbs, and adjectives across the ten themes collected from the Oxford English Picture dictionary. Most of the words are nouns (76%) which makes sense because visual dictionaries mainly show objects, people, animals, and things that can be pictured. Verbs (18%) are fewer as they represent actions and are often harder to depict visually. Adjectives (6%) are the smallest group mostly showing emotions or qualities. The distribution reflects how visual dictionaries focus on concrete words that can be illustrated easily while still including some actions and descriptive terms for a complete learning experience.

### Discussion
In the current research, visuals and infographics in the Oxford English Picture Dictionary were analyzed to know the role of the visuals in learning vocabulary. Under the guidance of Dual Coding Theory (Paivio, 1971), the results show that images contribute remarkably to the meaning formation, especially when it comes to concrete vocabulary elements.

One of the significant results of the research is the prevalence of nouns in visual depiction. Table No. 2 shows that the proportion of nouns, verbs, and adjectives is 76, 18 and 6 respectively of the total illustrated entries. Such a distribution shows that visual dictionaries pay much attention to the lexical items which can easily be demonstrated. This observation confirms the previous studies that concrete nouns are the most appropriate when it comes to pictorial representation since they refer to things that are solid and observable (Lew and Galas, 2008; Biesaga, 2018).

The thematic analysis also reflects that images can be efficient in the theme like Family and People, Food and drinks, animals, and nature, and Household objects. Images in such themes have a literal and instant meaning as they simply display what already exists. The Dual Coding Theory developed by Paivio (1971) indicates that when verbal labels and visual images are presented simultaneously, the retention and processing of information is enhanced. Mayer (2009) also makes the same argument that it is better when learners are exposed to words accompanied by some relevant image, to understand concepts.

The verbs are less represented, but the study indicates that action-based illustrations are nonetheless relevant in learning vocabulary. In the Actions/ Verbs theme, pictures of activities or eating, walking or reading help the learners associate the verb with the movement they see. This helps Nessi (2000) argue that visuals are the fast access meaning facilitators especially in cases were making definitions verbally might be inadequate. Nevertheless, the comparatively smaller representation of verbs indicates the fact that it is difficult to represent actions in terms of the static image.

The smallest group in the dictionary is represented by adjectives and emotions. These are words which are abstract and non-visual. Irrespective of this, the dictionary applies facial expression and situations to indicate emotions like joy, sorrow or fear. This will correspond to the idea of the multimedia learning theory developed by Mayer (2009), according to which abstract concepts can be explained well through

innovative visuals that are carefully designed. However, the fact that adjectives were not represented greatly suggests that adjectives in dictionaries need to be represented using more artistic methods.

On the whole, the results indicate that the Oxford English Picture Dictionary successfully uses the visuals in facilitating the vocabulary acquisition, especially the concrete nouns. Nevertheless, the underrepresentation of verbs and adjectives accentuate a subject of consequential enhancement in lexicography visual.

## Conclusion

This paper has discussed how visual lexicography is applied in the Oxford English Picture Dictionary and how images and infographics can be used in vocabulary acquisition. Based on Dual Coding Theory, the results confirm that images are an effective way of boosting vocabulary and retention of concrete nouns.

As it is shown in the analysis, the most visual representation is given to nouns, then verbs and adjectives. Although such a distribution is going to correspond with ease of illustrating definite items, it also brings out a gap in visual representation of the verbs and adjectives, which are vital in language development. Even though the dictionary relies on contextual and expressive visuals to illustrate actions and emotions, these terms are underrepresented.

Finally, the application of visual features in the process of vocabulary acquisition can be seen in the Oxford English Picture Dictionary. To increase its pedagogical content even more, the design of the future dictionaries should develop visual expression of the verb and adjectives by offering creative and context-related illustrations. These would lead to more well-balanced and thorough visual lexicography.

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