Using Infographics in Teaching Turkish as a Foreign Language

İsmail Yavuz ÖZTÜRK
Faculty of Education, Mersin University, Turkey
iyavuzozturk@mersin.edu.tr

ABSTRACT
Infographics, which can present the message to be conveyed to the target person or audience by combining multiple coding systems such as text, line, picture, photograph, video, map, sound, enable the regular, effective and efficient transfer of large amounts of complex information, data or knowledge. They, which have become increasingly popular lately, are frequently encountered in areas such as the press, public transportation, marketing and advertising. It is thought that they can be used in educational activities. The facts that human brain's ability to analyze and interpret visuals in a shorter time than a written text and to store them for a longer period of time and today's students, who see living in the virtual world as much more than a hobby, need more concise and understandable content with the increasing interaction of digital screens compared to previous generations, makes the place of infographics in educational activities clear. Based on this information, it is aimed to present a perspective on the ways of using infographics in teaching Turkish as a foreign language with this research. In order to achieve this objective, scientific publications on infographics and their use in education, the Common European Framework of Reference for Languages, Turkish Maarif Foundation Teaching Turkish as a Foreign Language Curriculum are scanned, and suggestions are offered on how the aforementioned material can be used in teaching Turkish as a foreign language.
Keywords: Infographic, Educational activity, Listening and watching, Teaching Turkish as a foreign language.

INTRODUCTION

The current century is witnessing rapid changes and developments in information technologies. Especially with the diversification of electronic devices with screens, people are exposed to audio-visual messages more than previous generations in their daily lives. Due to this density, they tend to the messages prepared with coding systems that they can make sense of in a short time and more easily. Now, instead of reading long written texts, they prefer texts that are coded only with audio-visual coding systems or that are supported by short writings. Infographics are materials that can be presented to the reader/viewer by blending more than one audio-visual coding system with less written text in such a time period and therefore frequently used in many fields.

It is seen that many definitions were made on the infographic when the literature was scanned. According to Damyanov and Tsankov (2018), Ross (2009), Siricharoen and Vinh (2016) an infographic is 'visual representation of information, data or knowledge'. Meirelles (2013, 11) defined it as 'infographics stand for visual displays in which graphics (illustrations, symbols, maps, diagrams, etc.) together with verbal language communicate information that would not be possible otherwise.' Li et al. (2014, 11) said that 'Information graphics (infographics), are effective visual representations of complex information.' From the Krum's (2013) point of view, it is the way of presenting information by employing various visuals and written texts in a visual form within a certain flow. Many components such as pictures, graphs, charts, flow diagrams and texts can take part in it. In Simicklas's (2012, 3) book, more formal (according to him) definition was presented: A visualization of data or ideas that tries to convey complex information to an audience in a manner that can be quickly consumed and easily understood. The above definitions focus on visual and text in terms of the coding systems that infographics contain. However, it should not be forgotten that infographics may contain audio. Indeed, Lankow et al. (2012) and Schroeder (2004) stated that video, animation and sound can be added to interactive infographics after dividing them into types. In line with all these definitions and opinions, infographics can be defined as follows:

A material that can present the message to be conveyed to the target person or audience by combining multiple coding systems such as text, line, picture, photograph, video, map, audio and enable the regular, effective and efficient transfer of large amounts of complex information, data or knowledge.

Infographic Types

Infographics based on the invention of line, bar and pie charts by 18th century Scottish engineer and economist William Playfair (Otten et al., 2015) were classified according to different points of view. Albers (2015) divided the infographics into four groups: *Bullet list equivalent, snapshot, flat information, information flow/process*.

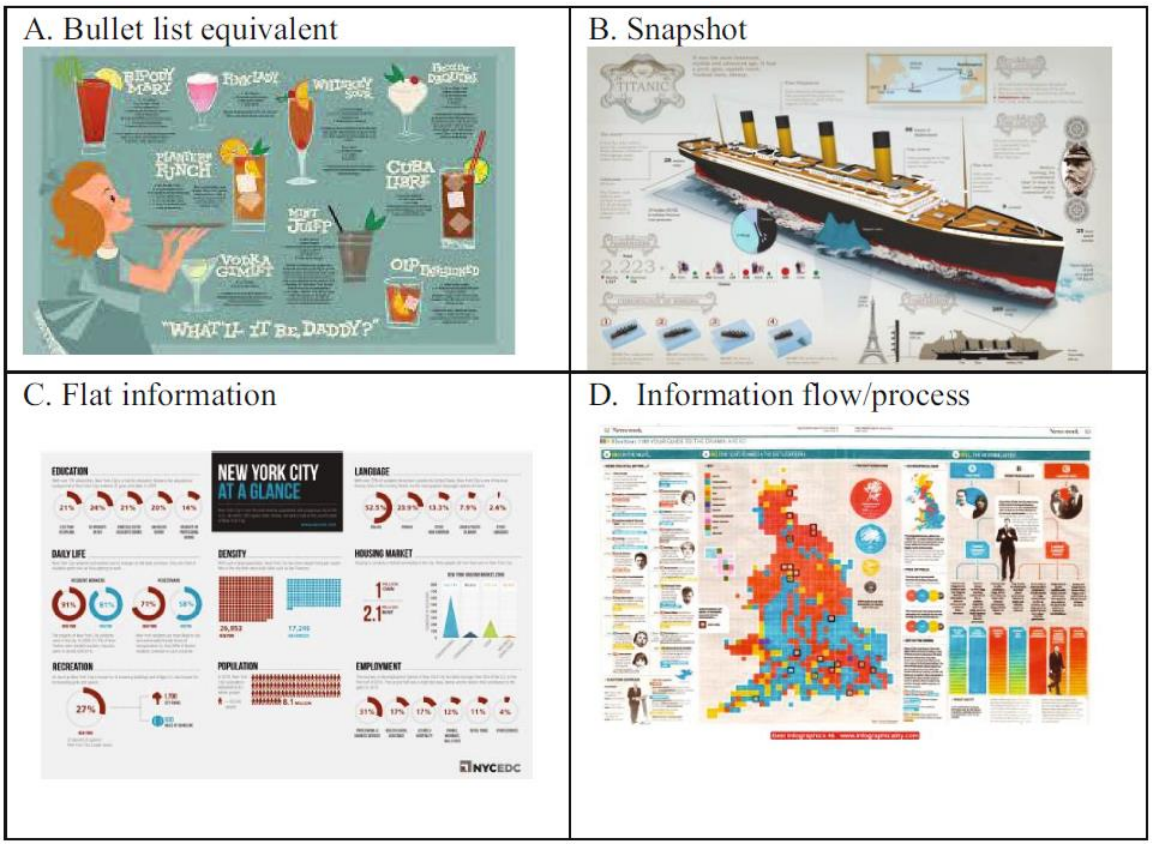

Figure 1. Albers' infographic classification (2015, 269)

Damyanov and Tsankov (2018) grouped them as *static*, *interactive*, *video infographics*. In Hassan's (2016) dissertation, infographics grouped as *static* or *animated*. According to Lankow et al. (2012), they can be divided into three groups as *interactive*, *semi-interactive* and *non-interactive* in terms of the multimedia elements they contain. While Otten et al. divided infographics into three groups as '*data graphics*, *maps* and *diagrams*' or '*static*, *animated* and *diagrams'*, Ashton (2013) classified them as follows: *The quizzical: X facts about (topic)*, *the challenging: visual answer to a question*, *the engaging: flowchart*, *the controversial: versus infographic*, *the infallible: how-to*, *the good old: guide to (topic)*, *the traveler: x around the world*, *the listicle: x ways/tricks/tips to (topic)*, *the wannabe: x lessons/habits from (successful people)*.

All the classifications above are taken into account; it can be said that infographics can be divided into types according to whether they contain movement or allow interaction. Accordingly, an infographic is either static or animated. As Mortensen (2020) said, static infographic is the most widely used type and can be easily designed, shared, and printed. Animated infographics, on the other hand, are designed to be displayed on the screen in order to attract the attention of the reader and make the message transfer more effective, but they are more expensive and very difficult to print. Complex scientific subjects, events and processes, which are really difficult to explain and visualize with static infographics, can be easily grasped by the readers thanks to the new dynamic environment in which they take place (Hassan, 2016; Mortensen, 2020).

On the other hand, infographics can be classified according to whether they allow interaction or not. Interactive ones give readers the opportunity to make choices and access information based on those choices (Lankow et al., 2012) or to enter their own data so that they can personalize them (Mortensen, 2020). For example, when clicking on an image or text on the infographic, more information or video content about the subject appears, the reader can choose one of the options in the content and proceed or give readers the opportunity. Infographics that do not offer this opportunity to the reader are non-interactive. These may contain animated elements such as video and animation, but they do not offer any interaction to the reader.

Leveraging Infographics in Education

In this century, the Y (millennials) and Z generations (centennials) live and interact with their screen devices, and from the moment they wake up with their smart phone alarm clock to the last social media posts of the day. They also use them to connect, learn and run their academic tasks. As they are used to these devices, they want to see and use them in their classroom environments. Especially there is a noticeable difference in the shortened attention

spans of centennials, their visual ability portion of cognitive functions more increased than predecessors, so the visual forms of learning more attractive and interesting for them (Chun et al., 2017). Teaching based entirely on direct instruction method can be extremely challenging for them, as 'tend to have a low tolerance for boredom and require high levels of stimulation to remain focused (Roehling et al., 2011)'. In the other words 'Auditory learning (lecture and discussion) is very strongly disliked by this age group (Rothman, n.d.).' Student-centered curriculums and classroom environments that take into account their interests or preferences and making them active participants should be created by instructors (Hernandez-de-Menendez et al., 2020). Infographics which present large amounts of information, data or knowledge in a compressed and easy-to-understand format (Siricharoen and Siricharoen, 2015) could play an important role at this point.

Of the 12 pairs of nerves (cranial nerves) coming out of the brain, 6 are connected to the eye (Acarkan, 2017). Therefore, the importance of seeing in sensation and perception is obvious. As Medina (2008) stated, the more visual the input, the more likely it is to be recognized and remembered. In addition, Nelson's 'Theory of Picture Superiority' explains how people learn concepts more easily through visuals rather than just reading written texts (Clark & Mayer, 2011). These facts reveal that infographics as contain visual coding systems (charts, icons, symbols, pictures, videos, etc.) should be used in educational activities effectively.

> *When visuals are used effectively, they serve to help people understand abstract, complicated, and complex information, especially when people are unfamiliar with the concept and do not have a pre-existing mental model to assist with the comprehension of new information* (Dunlap and Lowenthal, 2016, 44).

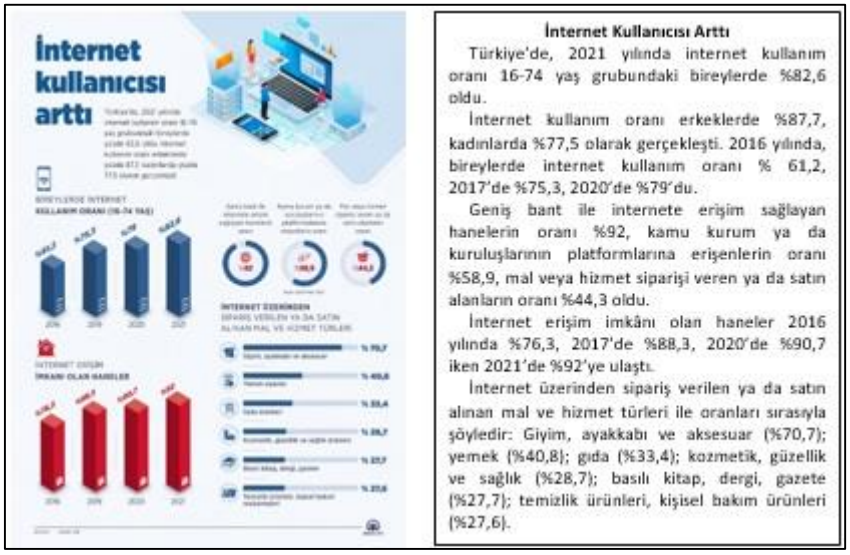

Figure 2. Same messages presented in an infographic (Anadolu Agency, 2021) and a written text

It is thought that the infographics created by adding sounds to the visuals would be more successful in the effective learning of individuals with different intelligence types and learning styles, especially when millennials and centennials taken into account. In fact, thanks to the interactive infographics, more senses (touch) of the students are addressed and their motor skills are included, so teaching and learning becomes more efficient.

> *Retention of what is learned is likewise related to sensory experience. These senses are critical when it comes to improving instructional outcomes in the classroom. Each sensory within itself can dramatically enhance students learning experiences and provide students with extra support that will develop their memory and recall of information* (Aja et al., 2017, 15113).

In a study conducted by Shridevi et al. (2013), students who were exposed to audio-visual method performed better and enjoyed this learning way. In this regard, Aggarwall (2017, 274) stated the following:

> *Audio-visual aids provide significant gains in informational learning, retention and recall, thinking and reasoning activity, interest, imagination, better assimilation and personal growth and development. The aids are the stimuli for learning 'why', 'how', 'when' and 'where'.*

Lyra et al. (2016) found that students who learned the same content through infographics remembered longer than those who learned it through graphics+text. This case indicate that infographics can better support robust learning.

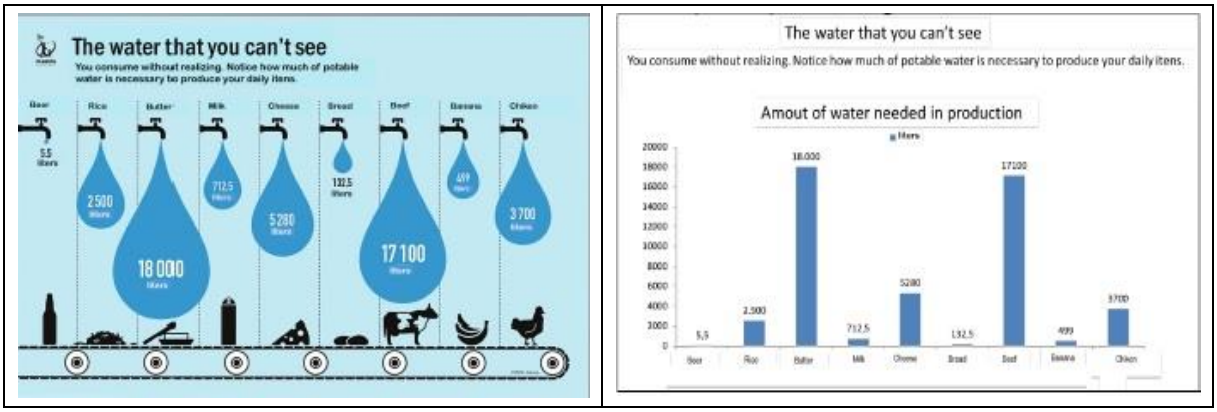

Figure 3. An infographic and a graphic+text which have the same content, used in the research of Lyra et al. (2016, 367)

Uyan Dur (2014) emphasized that well designed infographics are important tools to persuade, direct and mobilize people. Therefore, teachers whose task is to eliminate the attitude and behavior disorders of their students and to create new attitudes and behaviors in them (Deniz, 2018) should use well-designed infographics.

Infographics that include art in the staid world of digital data (Davidson, 2014), are materials that can be easily shared when produced in digital format (Marabella, 2014). It can be easily distributed to large audiences via social media platforms or e-mails. Thus, while designing and developing materials for the Y and Z generation (which also has an important place in distance education), the ground for interaction is prepared.

According to Davis & Quinn (2013, p. 16) 'Infographics can support reading comprehension and writing while strengthening critical thinking and synthesizing skills.' By adding audio(s) an infographic can stimulate students auditory channel and thus it can also be used to improve their listening skill. Furthermore, based on the content of this type of material, writing and speaking activities could be conducted. In addition to these, infographics, which can also be called "story graphs" because they present the data in a narrative flow (Otten et al, 2015; Weinschenk, 2011), have also become a good way of storytelling. In the other words, they can be utilized in language education courses as story texts. Stories help students understand data and establish cause-effect relationships; infographics also enable the communication of data by being visualized and presented as a story (Weinschenk, 2011).

Infographics, unlike standard written texts that are long and dense, present information in layouts which often include graphs or boxes to separate them, white space, larger gaps between sentence lines, and so can be used to help students understand the relevant text thanks to their ability to present information in visual format (Marabella, 2014).

Using and creating infographics would improve students' visual literacy skills, which would help teachers gain students' ability to make sense of and evaluate visual information. In addition, through the activity of designing a visual representation of complex ideas, their comprehension would be deepened by keeping them engaged with the content for a long time (Naparin and Saad, 2017), and their ability to express themselves could be developed.

Structure of an Infographic and How to Design It?

A teacher or an instructor should not only use well designed infographics, but also design them. In order to achieve this, it is necessary to know the structural features of infographics.

An infographic consists of three major parts in generally. According to Tatcher (2012) and Siricharoen (2013), these parts are *visual*, *content* and *knowledge*. Colors, maps, icons, (Tatcher, 2012) charts, symbols, pictures, illustrations etc. make up the visual part of an infographic. These construct the content of it: References, time frames, facts, text, etc. (Tatcher, 2012). Lastly, 'conclusion to express the stories or messages (Siricharoen and Siricharoen, 2015, 558)' refers to the *knowledge* part of it. These three pieces have to be successfully organized by the teacher.

Creating an infographic is based on its designer's creativity, so it is unlimited. Since the main purpose of infographic is to make readers summarize information quickly in the world full of flooding information (Siricharoen and Siricharoen, 2015), a teacher sometimes has to act as a graphic designer or an artist and have to take into account aesthetic. If he/she is going to do these in digital environment, should have the ability to use the necessary devices (computer or smart phone), programs or applications. There are a lot of applications on the web which offer the opportunity to prepare different types of infographics easily and online. Also they have ready

templates. Teachers should benefit from these platforms.

Determining the objective could be the first step of preparing an infographic. Teacher should ask himself/herself this question at this stage: What skills do I aim to teach my students, and what do I aim to teach them through the infographic I will prepare? The second step could be choosing the appropriate infographic type. As presented above, there is a wide variety of infographic types available. Answers to questions such as 'Will it be horizontal or vertical, interactive or non-interactive, static or animated, consist of one page or more?' should be sought. Which data, information or knowledge will be presented should be determined at the third step. These can be many, the important thing is that they are as short and concise as possible. The following quote attributed to Albert Einstein comes to mind at this point: 'If you can't explain it simply, you don't understand it well.' The fourth step is deciding which coding systems to use. Such question can be asked: Will it only include visual coding systems? Or will it be a mix of text and visuals? Will it have sound effects or music? Finally, teacher should think about the visual stance of the infographic. Determining the positions of the elements that make up the infographic based on their relationships with each other, using separator spaces and dividing lines to separate content and sections, employing bold fonts and subheadings to highlight certain words, placing bullet points, adding correct guiding elements (orientation arrows, various symbols or signs, etc.) on the page, choosing the right colors are the points to be considered at this stage.

As Otten et al. (2015, 1902), citing from Ovans (2014), stated 'The least effective infographics tend to be visually overwhelming, using excessive or extraneous data or "noise," or present information in a way that is confusing or makes it appear insignificant.'. For this reason, a teacher should choose content suitable for the level of the students (age, gender, background information, etc.) and present them in a concise manner. In addition, as Balliette (2012) underlines, he/she should give the most visual weight to the most important information.

Consistent design, text-image harmony, grabbing and holding attention, connecting with the reader (power of kindling images, emotions and memories) are important for a successful infographic (Dunlap, 2016). In addition to these, the message should be conveyed without giving too much space to the text and by using visual coding systems as much as possible. In theory, an infographic should make sense to the reader without adding words or text (Marabella, 2014).

Carrying out effective educational activities with infographics prepared by considering design principles will help to achieve the determined goals and gain skills. It is thought that these materials can be used effectively in teaching Turkish as a foreign language.

METHODS

In this research based on literature review, scientific publications on infographics and their use in education, the Common European Framework of Reference for Languages (CEFR), Turkish Maarif Foundation Teaching Turkish as a Foreign Language Curriculum (TMFC) were scanned and accordingly suggestions on how to use infographics in the process of teaching Turkish to foreigners were presented through examples.

Using Infographics in Teaching Turkish as a Foreign Language

Many researches have been carried out on infographics and their usage in education. However, no study has been encountered on the use of infographics in teaching Turkish to foreigners as a result of search in databases [Elton B. Stephens Company Open Dissertations, ProQuest Dissertations & Theses (PQDT), Higher Education Council Thesis Center, TR Index, DergiPark Academic, Education Resources Information Center (ERIC), Taylor & Francis, Science Direct-Elsevier] with the keywords 'Infographic, Information Graphic, Teaching Turkish, Teaching Turkish as a Foreign Language'. Based on the current deficiency in the literature, it is aimed to present a perspective on how to use infographics in teaching Turkish as a foreign language.

Teaching emotional words

Emotional words are among the topics covered in the early stages of teaching Turkish to foreigners. When the TMFC and CEFR are scanned, it is seen that the said skill is acquired at A1 level. 5 of these words (mutlu, korkmuş, kızgın, şaşkın, üzgün) can be taught through the animated infographic that has 3 pages below:

Figure 4. First page of an infographic to be used in teaching emotional words (https://view.genial.ly/612b78d08ae5140dc46523d1/interactive-content-emoji-moments)

On the first page, students are told that 'there are words that reflect the inner world of people in every language (Temur and Arslan, 2018)'. After this, students are asked to guess the Turkish words that represent 5 emotional states supported by emojis. Thus, their foreknowledge about whether they know the words aforementioned is determined. And then, teacher switches to the next page.

Figure 5. Second page of an infographic to be used in teaching emotional words

The second page shows what these words are. When attention is paid, various information about emotions are given on the right and left sides. Students are provided to read this information. Attention is drawn to unfamiliar words. They may be asked to talk about them. Attention was paid to the fact that the sentences on the pages were active, and passive sentences were not included. Because passive sentences are not taught to students at this level yet. However, passive sentences can be added to the material in later stages.

Figure 6. Third page of an infographic to be used in teaching emotional words

On the last page, students are asked to say how they feel and why within these five words. This allows them to speak, albeit briefly.

Teaching idioms

Infographics can also be used while teaching idioms in Turkish. The animated and interactive infographic below has been prepared for the purpose of teaching a few idioms that contain the word 'kuş (bird)' in Turkish. The student can see the meaning of that idiom from Dictionary of Turkish Language Institution and its usage in a sample sentence by moving the mouse cursor of their computer over the idioms or touching their finger on the related idiom. They can also hear the sounds of sea waves and seagulls in the background, in accordance with the context.

Idiom teaching also has an important place in terms of cultural transfer. Therefore, it can be said that it would be appropriate to use infographics that can convey complex information through few signs in the teaching of these language structures that can tell a lot with few words.

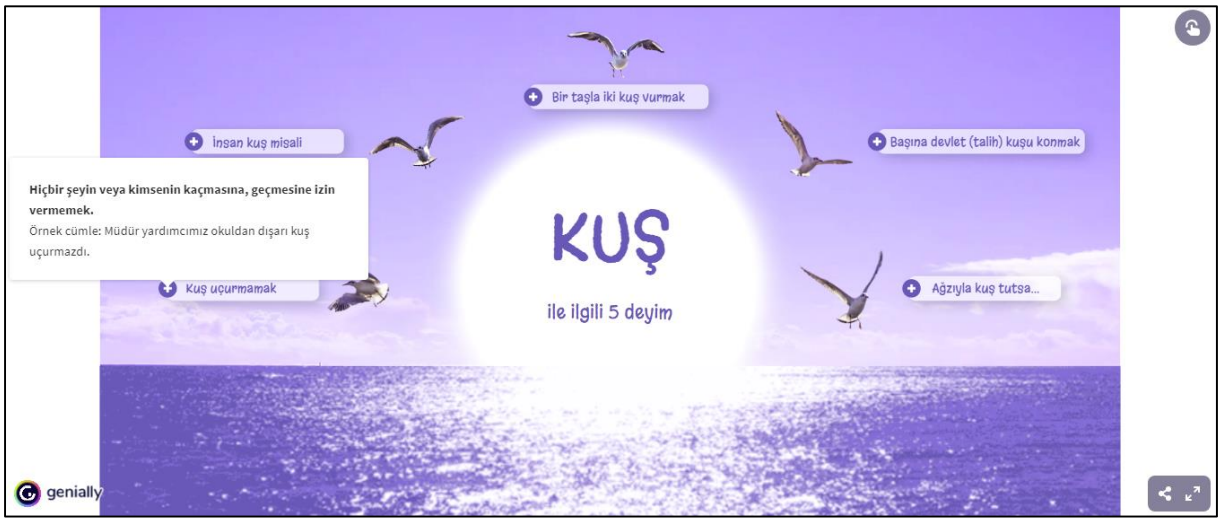

Figure 7. An animated and interactive infographic to be used in teaching idioms (https://view.genial.ly/612b70fb9606e30dbd28500c/interactive-content-gulls-list)

Teaching vocabulary

Vocabulary knowledge plays vital role in second language learning, as limited vocabulary means limited communication (Alqahtani, 2011; Cook, 2013; Nation, 2011; Schmitt, 2000). In this context, examples of infographics prepared for the words taught in Turkish as a foreign language according to TMFC and CEFR are presented in this section.

An example of an animated and interactive infographic for teaching words representing parts of the body, which was first taught at A1 level, is given below:

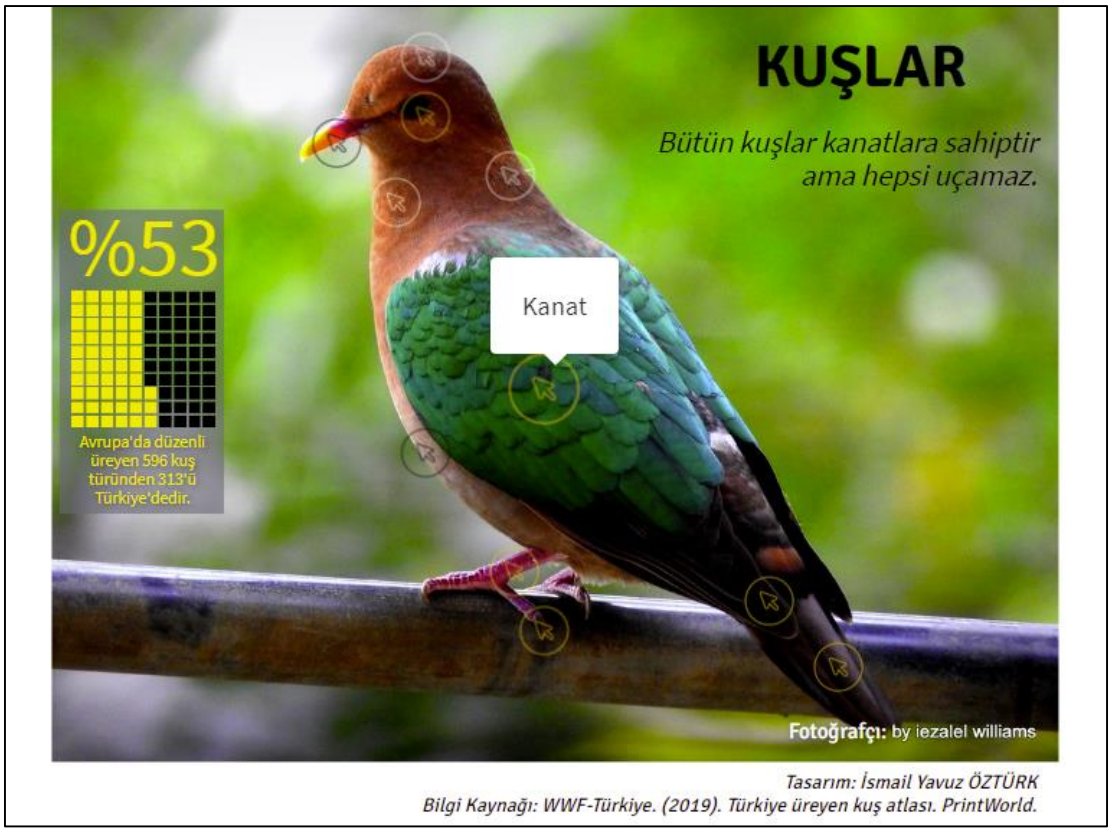

Figure 8. An animated and interactive infographic to be used in teaching vocabulary about birds (https://view.genial.ly/612aa921dabd400dbd0d585d/interactive-image-kuslarin-vucut-kisimlari)

Birds are animal from the learners' close circle. For this reason, an infographic was designed that shows the names of the body parts of the birds and gives simple information about this animal species. This material also includes a piece of information about the number of bird species in Turkey and a graphic on this subject within the scope of cultural transfer. The conjunction 'but', some numbers, percentiles, adjectives, spelling of some punctuation marks and present tense can also be taught through this infographic. The teacher can add the language structures he/she wants to teach by making changes on the content according to the level.

Through the following infographic example, simple present tense and present continuous tense, modals (can/could), noun and adjective clauses, numerical expressions, units of measure, comparison expressions can be taught. It can also benefit from this material in teaching vocabulary. In addition, the sentences in this material, which consists entirely of verbs with active voices, can be made passive by changing them for advanced levels.

Figure 9. An infographic to be used in teaching vocabulary about tigers

Gaining Ability to Follow Instructions

According to the CEFR and TMFC, the learner is also expected to gain the ability to follow the descriptions and instructions for doing a job at A2 level. For this purpose, the following infographic design can be used. The preparation of dry beans dish, one of the famous dishes of Turkish cuisine, is explained in five steps, supported by short instructions and visuals:

Figure 10. An infographic to be used in gaining ability to follow instructions

Numbers, quantity expressions and imperatives are taught as well as giving the learner the ability to follow instructions thanks to this material.

Gripping information expressed in a timeline

One of the skills that learners are expected to acquire in second language learning is to understand the expressions in the timeline correctly. The following sample infographic, prepared to help learners acquire this skill, which starts from A1 and continues to B2 according to CEFR and B1 according to TMFC, deals with space studies in Turkey since 1994:

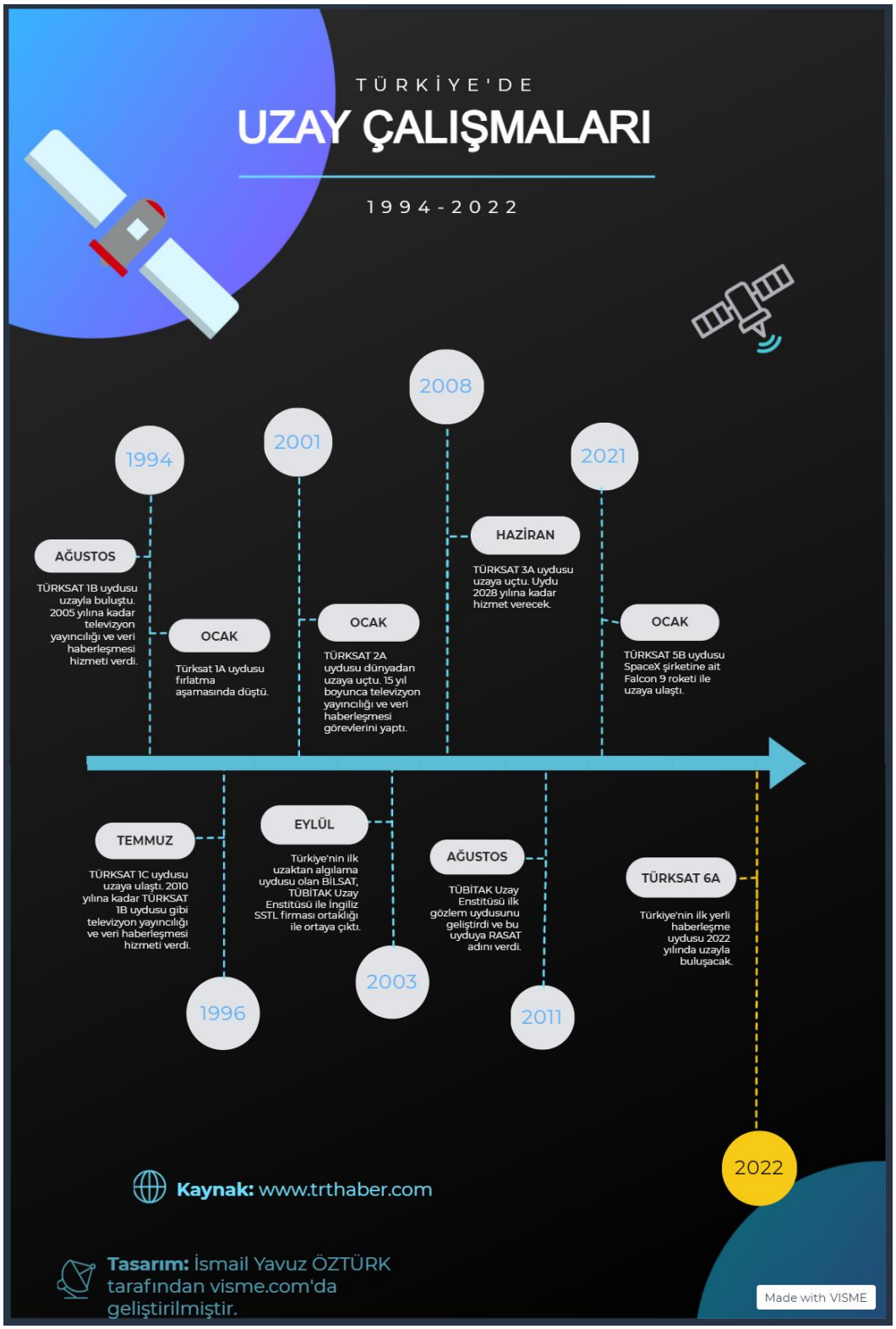

Figure 11. An infographic to be used in gripping information expressed in a timeline

Lines of different colors are used to separate the past and future events. Simple past tense, simple future tense, active voices and passive voices (from B1 according to TMFC), verbal adverbs [‘-e kadar (until)’ in this material (from A1 according to the TMFC)], numbers, noun and adjective clauses, some abbreviations can be learned via this infographic.

CONCLUSION

Infographics, effective and efficient way of presenting large amount of complex messages by combining multiple coding systems, should be used in educational activities as well as other areas. Especially when Y and Z generations are taken into account, the necessity of infographics in educational activities emerges. Although there are many classifications in the literature, it is thought that infographics can be divided into two as interactive/non-interactive or static/animated. According to this categorization, an infographic may be animated and may or may not allow interaction from another point of view. Although it is difficult to develop, it can be said that using interactive, at least animated infographics in education is more effective. In addition to visual coding systems, including audios will be more beneficial in order to increase the effectiveness of teaching by addressing more senses. The fact that these materials can be produced in digital format and easily delivered to more people also increases the interaction in teaching process. There are studies showing that infographics are also effective in language and thinking educations. Therefore, these materials can also be used in teaching Turkish to foreigners.
In this paper, after emphasizing the design steps and the points to be considered at these steps, it is aimed to present a perspective on how infographics can be used in teaching Turkish to foreigners based on 6 sample materials. It is thought that it would be beneficial for teachers working in the field to design various infographics by making use of these examples and paying attention to design principles. Both printed and digital infographics should be added to the textbooks. In addition, in the next process, studies should be carried out to investigate the effectiveness of these type of materials using experimental designs.

References

Aggarwall, J. C. (2017). *Essentials of educational technology* (3rd edition). Vikas.

Aja, S. N., Eze, P. I., Igba, D. I, Igba, E. C., Nwafor, C. C., Nnamani, S. C. (2017). Using multi-sensory instruction in managing classroom for effective teaching and learning. *International Journal of Applied Engineering Research, 12*(24), 15112-15118.0

Albers, M. (2015). Infographics and communicating complex information. In Marcus A. (Ed.) *Design, User Experience, and Usability: Users and Interactions*. Springer. https://doi.org/ 10.1007/978-3-319-20898-5_26

Alqahtani, M. (2015). The importance of vocabulary in language learning and how to be taught. *International Journal of Teaching and Education, 3*(3), 21-34. https://doi.org/10.20472/TE.2015.3.3.002

Anadolu Agency. (2021, August 26). *Türkiye'de internet kullananların oranı bu yıl itibarıyla yüzde 82,6'ya yükseldi*. https://www.aa.com.tr/tr/info/infografik/24660

Ashton, D. (2013). *The 9 types of infographic*. http://neomam.com/infographics/the-8-types-of-infographic/

Balliette, A. (2011, October 14). *The do's and don'ts of infographic design*. Smashing Magazine. http://www.smashingmagazine.com/2011/10/14/the-dos-and-donts-of-infographic-design.

Clark, R. C., & Lyons, C. (2010). *Graphics for learning: Proven guidelines for planning, designing and evaluating visuals in training materials*. Pfeiffer.

Clark, R. C, & Mayer, R. E. (2011). *e-Learning and the science of instruction: Proven guidelines for consumers* (3rd ed.). San Francisco, CA: John Wiley & Sons

Damyanov, I. & Tsankov, N. (2018). The role of infographics for the development of skills for cognitive modeling in education. *International Journal of Emerging Technologies in Learning, 13*(1), 82-92. https://doi.org/10.3991/ijet.v13i01.7541

Davidson, R. (2014). Using infographics in the science classroom. *Science Teacher, 81*(3), 34-39.

Deniz, K. (2018). *Eğitimde insan ilişkileri ve iletişim*. Gece Kitaplığı.

Dunlap J. C. & Lowenthal, P. R. (2016) Getting graphic about infographics: design lessons learned from popular infographics. *Journal of Visual Literacy*, *35*(1), 42-59. https://doi.org/10.1080/1051144X.2016.1205832

Chun, C., Dudoit, K., Fujihara, S., Gerschenson, M., Kennedy, A., Koanui, B., Ogata, V., & Stearns, J. (2017, January, 8-10). *Teaching Generation Z at the University of Hawai'i* [Conference presentation]. The IAFOR International Conference on Education, The Hawaii Convention Center, Honolulu, Hawaii, United States. http://papers.iafor.org/conference-proceedings/IICE/IICEHawaii2017_proceedings.pdf

Council of Europe. (2020). *Common European framework of reference for languages: learning, teaching, assessment-companion volume*. Council of Europe Publishing. https://coe.int/lang-cefr

Cook, V. (2013). *Second language learning and language teaching*. Routledge.

Hassan, H. G. (2016). *Designing infographics to support teaching complex science subject: a comparison between static and animated infographics* [Unpublished master thesis]. Iowa State University.

Hernandez-de-Menendez, M., Escobar Díaz, C.A., Morales-Menendez, R. (2020). Educational experiences with Generation Z. *International Journal on Interactive Design and Manufacturing*, 14, 847–859. https://doi.org/10.1007/s12008-020-00674-9

Lankow, J., Ritchie, J., & Crooks, R. (2012). *Infographics: the power of visual storytelling*. John Wiley & Sons.

Li Z., Carberry S., Fang H., McCoy K.F., Peterson K. (2014). Infographics retrieval: a new methodology. In

Métais E., Roche M., Teisseire M. (Eds.) *Natural language processing and information systems*, *NLDB 2014*. Lecture Notes in Computer Science, vol. 8455. Springer, Cham. https://doi.org/10.1007/978-3-319-07983-7_15

Lyra, K. T., Isotani, S., Reis, R. C. D., Marques, L. B., Pedro, L. Z. (2016). Infographics or graphics+text: which material is best for robust learning? In J. M. Spector, C. C. Tsai, D. G. Sampson, Kinshuk, R. Huang, N.S. Chen, P. Resta (Eds.), *IEEE 16th International Conference on Advanced Learning Technologies (pp. 366-370)*, The Institute of Electrical and Electronics Engineers. https://doi.org/ 10.1109/ICALT.2016.152

Krum, R. (2013). *Cool infographics: effective communication with data visualization and design*. John Wiley & Sons.

Marabella, A. (2014). *Communication theories: An infographics development project* [Unpublished master thesis]. Southern Utah University.

Medina, J. (2008). *Brain rules: 12 principles for surviving and thriving at work, home, and school*. Pear Press.

Meirelles, I. (2013). *Design for information: an introduction to the histories, theories, and best practices behind effective information visualizations*. Rockport publishers.

Mortensen, E. (2020). *Infographics: three formats for communicating information*. https://modicum.agency/blog/infographics-three-formats-for-communicating-information/

Naparin, H., Saad, A. B. (2017). Infographics in education: review on infographics design. *The International Journal of Multimedia & Its Applications, 9*(4/5/6), 15-24. https://doi.org/ 10.5121/ijma.2017.9602

Nation, I. S. P. (2001). *Learning vocabulary in another language*. Cambridge University Press.

Otten, J. J., Cheng, K., Drewnowski, A. (2015). Infographics and public policy: using data visualization to convey complex information. *Health Affairs, 34*(12), 1901-1907. https://doi.org/10.1377/hlthaff.2015.0642

Roehling, P., Kooi, T., Dykema, S., Quisenberry, B., & Vandlen, C. (2011). Engaging the millennial generation in class discussions. *College Teaching, 59*(1), 1-6. https://doi.org/10.1080/87567555.2010.484035

Ross, A. (2009). *Infographics designs: overview, examples and best practices*. http://www.instantshift.com/2009/06/07/infographic-designs-overview-examples-and-best-practices.

Rothman Ph.D., D. (n.d.). *A tsunami of learners called generation Z*. http://mdle.net/Journal/A_Tsunami_of_Learners_Called_Generation_Z.pdf

Schmitt, N. (2000). *Vocabulary in language teaching*. Cambridge University Press.

Schroeder, R. (2004). Interactive info graphics in Europe--added value to online mass media: a preliminary survey. *Journalism Studies, 5*(4), 563-570. https://doi.org/ 10.1080/1461670041233129647 3

Siricharoen W. V. (2013) *Infographics: the new communication tools in digital age*. In: International conference on E-technologies and business on the web. Bangkok, Thailand, 169–174. http://sdiwc.net/digital-library/infographics-thenew-communication-tools-in-digital-age

Siricharoen, W. V. & Siricharoen, N. (2015, 12-15 May). *How infographic should be evaluated?* [Conference presentation]. The 7th International Conference on Information Technology, AL-Zaytoonah University, Amman, Jordan. https:/doi.org/ 0.15849/icit.2015.0100

Siricharoen, W. V. & Vinh, P. C. (2016). Question matrix method according to divided dimensions of infographics evaluation. *Personal and Ubiquitous Computing, 21*(2), 219-233. https://doi.org/ 10.1007/s00779-016-0988-7

Smiciklas, Mark. T*he power of infographics: using pictures to communicate and connect with your audience*. QUE Publishing.

Temur, N. & Arslan, H. (2018). Yabancı dil olarak Türkçenin öğretiminde duygu durumu bildiren ifadelerin öğrenilme düzeyi. *Ana Dili Eğitimi Dergisi, 6*(3), 877-893. https://doi.org/10.16916/aded.420963

Thatcher, B. (2012). *An overview of infographics* [Webinar]. Illinois Central College Teaching and Learning Center. https://www.slideshare.net/ICCTLC2/an-overview-of-infographicsv5-0-15179863

Turkish Maarif Foundation. (2020). *Teaching Turkish as a foreign language curriculum* (2nd edition). Matsis Matbaa. https://www.turkishmaarif.org/uploads/Turkcenin_Yabanci_Dil_Olarak_Ogretimi_Programi_2_Baski.pdf

Uyan Dur, B. İ. (2014). Data visualization and infographics in visual communication design education at the age of information. *Journal of Arts and Humanities (JAH)*, 3(5), 39-50. https://www.theartsjournal.org/index.php/site/article/view/460/267

Weinschenk, M. (2011). *100 things every designer needs to know about people*. New Riders.