



A Case for Using Authentic Infographics as Language Tasks

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Digital technology has changed how we create and process information. It is suggested that we have moved from 'a world told to a world shown' as images have become central to digital information dissemination. One commonly used image is the information graphic (infographic). The first part of this paper briefly discusses the rise of infographics as part of an increase of non-linguistics modes of communication used in digital content. The second part of the paper demonstrates how authentic infographics principledly implemented through task-based learning can be used effectively in the language classroom to develop language proficiency and 21st century literacies like multi-modal literacy.

Keywords: Infographic, task-based learning, task generator, multi-modal literacy, data visualization, transmediation

Introduction

What are Infographics and Why are they Useful for Learning?

Written text has a prestigious and dominate role in most societies. People equate being literate with the ability to read and write. A quick search of the Internet will reveal that the first webpages in the mid-90s were primarily comprised of text. However, 30 plus years later, images are now equally central to digital information. One commonly used visual representation of information is the infographic (information graphic). An infographic is a combination of data visualization, illustrations, images, and text that are designed to efficiently communicate information (Krum, 2014, p. 6). Infographics with these multi-modal features permeate all spheres of the 'networked knowledge economy,' and feature prominently in traditional print-based media (Dick, 2020). In 2004, the word infographic registered around three out of 100 on *Google Trend's* world-wide search interest popularity scale (0-100). By 2012, it reached 51 points before it hit a search peak of 100 in 2015 where it most recently hit a 100 again in early 2020.

The current widespread use of infographics has been facilitated, supported, and intensified by digital technology. One obvious reason why people are attracted to infographics is that we process more information through our vision than the other four senses (smell, taste, touch, sound) combined (Ware, 2004, p. 2). For recalling, remembering, or recognizing information the more visual the input the better. Research demonstrates that a solely visual presentation is more effective at facilitating recall than either an oral or a written presentation (Medina, 2014, pp. 191-197). We remember pictures better than words or sounds, and this is referred to as the 'picture superiority effect.' Infographics help us recall more than just information. They serve a number of interrelated functions in supporting and improving cognitive activities while we interact with information. For example, infographics can help ease working memory



constraints (Gathercole & Alloway, 2008, p. 68). They can also facilitate discovery, enhance detection and recognition during data analysis (Meirelles, 2013, p.13). For these latter reasons, infographics are indispensable in many research fields for understanding complex multidimensional relationships (Tuft, 2001). In second language research there is a call for better data analyses and presentation through data visualization (Garcia, 2021).

Infographics, Information Overload, and Big Data

The so-called digital age which started in the mid-20th century has had a profound impact on information generation and dissemination. Information has become at the same time overly abundant and more complex. These two features of overabundance and increased complexity are why infographics have become critical for publishing information. People regularly experience information overload from having too much of it available. If you were a *Twitter* user in 2007, you would have been potentially exposed to about 5000 tweets per day. Today, it is 657 million tweets per day and growing. This almost constant exposure to voluminous amounts of information has forced people to become ‘scanners’ of information. Nielson and Pernice’s (2010) eye-tracking research of webpage reading shows that a majority of people, even with no time constraints, scan rather than intensively read when processing digital text. According to their research, most people read no more than 20 percent of the words on a typical webpage. Davies (2018, p. 169) believes we are in an age where accessing information quickly to offer real-time response now takes precedent over the completeness or objectivity/truthfulness of the information. An unwillingness to read large amounts of text does not just apply to digital content. Twenge’s (2017, p. 61) research shows that the iGeneration (born from 1995 on) read fewer books and magazines even in digital form compared to other demographic groups. Infographics have thus become an essential tool for drawing attention to content, and then allowing readers to process that information in a manner that caters more to scanning than concentrated reading.

The increase of more complex information in our lives is the result of the big data revolution which has occurred over the past few decades. Big data is the product of the coinciding development of numerous digital technologies, infrastructures, techniques, processes, and their rapid uptake into society (Kitchin, 2014, p. 80). While organizations and institutions (e.g., government) have worked with large datasets for decades, current big data is both quantitatively and qualitatively different. It is comprised of the 3V’s: huge in volume, high in velocity (collected in or near real-time) and diverse in variety. Entire populations ($n = \text{all}$) can be captured (exhaustive), or individual objects can be minutely tracked (fine-grained). In addition, large datasets can be conjoined (relational), and new datasets can be added or expanded in size (extensionality) (Kitchin, 2014, p. 68). This information complexity manifested from big data has meant that data visualization has become essential for making datasets more comprehensible by helping reveal patterns, structures, and interrelationships that would otherwise remain invisible or hard to conceptualize (Williamson, 2017, pp. 35-41). Big data is not only technical, but also social in that it is generated, interpreted, and applied with intended consequences by actors and institutions with social, political, and economic biases and agendas (Williamson, 2017). For this reason, Williamson believes that big data is better understood as a socio-technical system.

Infographics as Part of the Rise of Multi-modal Literacy

Infographics designed properly can effectively and efficiently communicate complex information to people. The growth of infographics is part of an overall increase of non-linguistics modes of communication (visual, spatial, aural, and gestural) in digital content. This increase of multi-modal texts is fundamentally changing what it means to be literate in the 21st century. Kress (2003, p. 1) an early writer on multi-modal literacy (multi-modality), believes that the digital technology has facilitated a shift from the centuries-long dominance of writing (written text) to the new dominance of the image. We have moved from a ‘world narrated’ to a ‘world displayed’ as the medium of the book has been supplanted by

the medium of the digital screen (Kress, 2003, p.1). For Kress (2003, p. 20) the crucial point of this change is that both modes of writing/print and image are governed by distinct logics and affordances, and this has conceptual/cognitive and epistemological consequences for us. With the mode of writing, it is governed by the logic of time and sequence where meaning is derived from the ordering of elements that unfold in time one after the other. In contrast, the image is governed by the logic of space, simultaneity, and salience. When we read written text in a book for example we primarily engage in sustained and concentrated attention to the sequential content. This is not the case with multi-modal text. Multi-modal text designed with words, images, audio, and video requires differentiated attention to information by the way of the different modes. In other words, we are constantly shifting our attention to the modes which carry the most communicational significance at that moment in relation to the other modes (Kress, 2003, p. 174). Multi-modal texts are not the result of a simple additive process. To be able to properly read multi-modal texts one needs to know why certain modes were selected, what role they play, and how effectively they interact with each other. With the increasing rise of multi-modal text in our lives, and a preference for it among younger generations (Twenge, 2017), it seems pertinent that language teachers should also focus on multi-modal skills in the language classroom. To date there is scant literature on how to effectively incorporate infographic literacy into ESL classrooms. The guidance available generally focuses on infographics as visual aids (e.g., Pazilah & Hashim, 2018). The next section of this paper will demonstrate how ESL teachers can use authentic infographics in their classrooms to facilitate in a principled manner the development of both language ability and multi-modal literacy.

Task-based Learning and Authentic Infographics

Locating and Determining Infographic Quality

There are numerous introductory books on infographics for language teachers to learn about infographics, or just find interesting infographic materials (e.g., Krum, 2014). Free downloadable infographics on any topic/subject can easily be found on the Internet. Two popular sites are *Daily Infographic* and *Cool Infographics*. These two sites provide timely infographics with new ones constantly being uploaded for use. One other noteworthy site is *Gapminder.org*. This free resource offers users interactive data visualization tools to explore global issues like poverty, gender equality, income disparity, population growth, and so forth. Teachers searching infographic collections will be surprised by the vast selection of current and stimulating topics. Authentic infographics are ideal for teachers who want their students to engage with more real-world content than what you typically find in mainstream ESL materials where noncontroversial topics are the norm (Tomlinson, 2003). Infographics give teachers easier access into subjects that are challenging to explore communicatively with beginner level students through authentic print materials like books, newspapers, and research articles. The students' lower level often means too much time is focused on just trying to achieve basic comprehension of text heavy material at the expense of other language learning activities.

The first step for using an authentic infographic for a language lesson is to determine the quality of infographic. Tufte (2001, p. 51) offers five basic principles for determining infographic quality.

1. Is it well designed with interesting data?
2. Does it tell the truth?
3. Are complex ideas communicated clearly?
4. Does it facilitate ideas in the shortest time and space?
5. Is there a combination of data used?

The second principle requires teachers to consider the intended or unintended biases of the authors of the infographic and whether they are reflected in the data and design. This relates to the 'social' feature of

data and its presentation. As we will see with the infographic used in this paper (The World as a 100 People) the author’s goal of presenting world issues and features in a simpler way (as a 100 people) unintentionally masks the regional nature of some of the more important issues like access to clean water.

Tasks and a Task-based Learning Framework

Turning an infographic into a ‘task’ is the surest way to make it communicative. The most basic definition of a task is a classroom activity where students use the language they are learning to achieve a specific communicative goal or outcome. All the tasks presented in this paper are part of the well-known Willis (2022) task-based learning framework which ensures that the communicative focus (fluency) of a task is not at the expense of the development of students’ language accuracy and complexity.

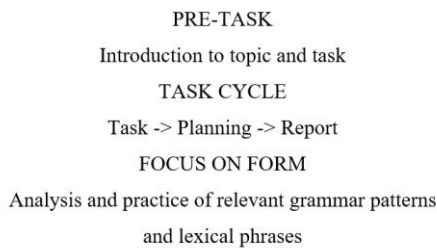


Figure 1. Willis task-based learning framework.

The task types used in this paper come from the Willis and Willis (2007, p. 107) task generator. These task types are easy to apply to any infographic. All the tasks, activities, and lessons in this paper center around Hagley’s (2014) infographic *The World as a 100 People* (reprinted with permission and downloadable from *Daily Infographic*). The overall lessons were for university students at the CEFR A1 to A2+ levels. Hagley’s infographic shows world issues and key features as represented by a 100 people (people instead of percent). This simple idea is why it was picked as one of the best infographics in the United States for 2014 (Cook, 2014).

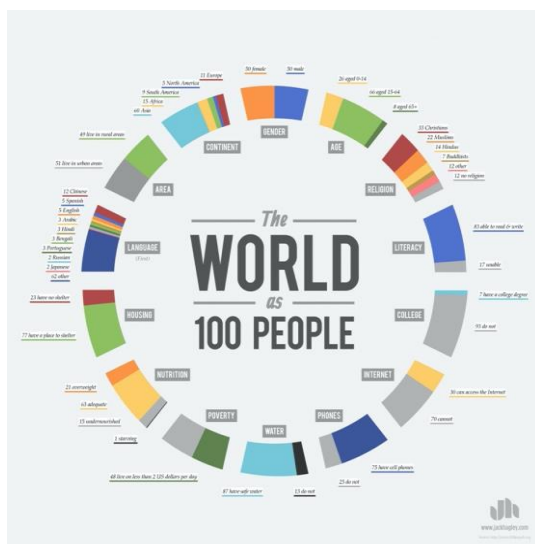


Figure 2. The World as a 100 people.

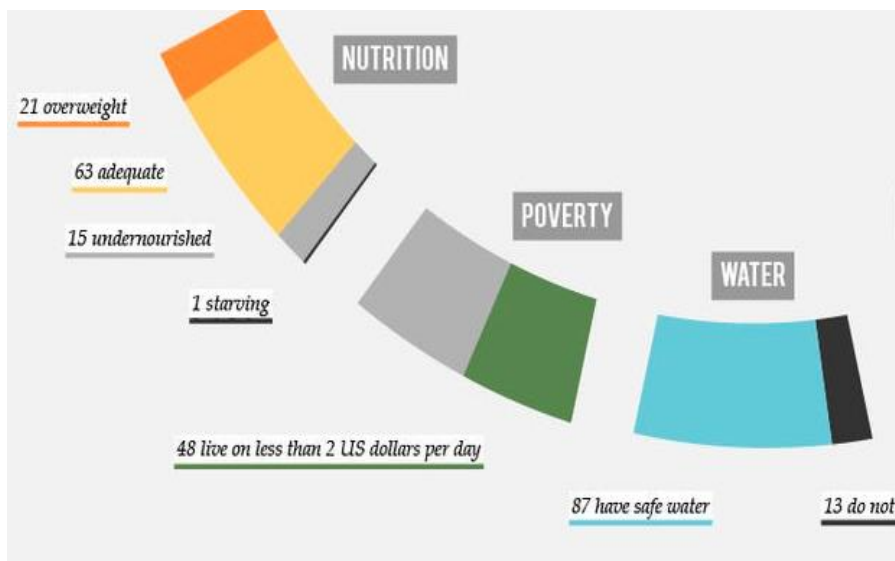


Figure 3. Excerpt of the World as a 100 people.

Ordering and Sorting Task for ‘Pushed Output’

Language teachers looking at Hagley’s infographic probably have three basic concerns stemming from the lack of text in the infographic, and the fact it is not a ready-made language task/activity. Specifically, hesitant teachers would be concerned about the quality of student output, quality or richness of the input and lastly what language does the teacher teach from the infographic since there is only vocabulary. This section will demonstrate how a task-based approach can overcome these three issues. In a task-based lesson it is impossible for the teacher to observe all spoken task work or have all students publicly report on their task outcomes. For this reason, one useful practice for teachers is to often digitally record a few pairs during their speaking tasks (the ones not observed) and in addition have all the students submit their written task reports at the end of class. This information besides being used for grading also allows a teacher to better analyze his/her students’ development and improve tasks. The extracts used below come from this practice.

For the first task-based lesson example the focus was on generating quality student output. Students in pairs had to compile a top five list (order and sorting task) of what surprised them the most about *The World as a 100 People*. Once pairs completed an agreed upon list, they then as part of the task cycle planned and wrote a report of their task outcome (the agreed upon list) for presentation to the class for discussion and language feedback. Having students produce reports (written or oral) of their task outcome for presentation pushes them to prepare their best language, and thus it offers important language learning opportunities (Willis, 2022). The first extract below is from a pair of students’ spoken task work (ordering and sorting of infographic categories) while the second extract is from their written report and pertains to what they said in the first extract.

Extract 1: spoken excerpt from pair work

S1: For number five I choose go college. Because I am surprised.

S2: Not me five, but I surprised too. Only seven! So, it’s okay. What degree mean?

S1: Gakui.

S2: Ah, okay. Number five is college degree.

Extract 2: excerpt from the students' report (before teacher feedback)

We chose for number five college degree. We are very surprised because we think many young people in world go college. Of 100 people only seven have college degree. That is very surprising. We feel so lucky we can go. Many of high school friends go to college. We want to take a degree.

In the spoken extract both students expressed surprise at the college degree data. The second extract suggests that the pair pushed their language production during the report stage because there is a noticeable difference in quality between the two extracts. For example, in the second extract they elaborate on their first extract 'surprise' about the college data by writing *We are very surprised because we think many young people in world go college*. In addition, they expand S2's elliptical utterance *Only seven!* into *Of 100 people only seven have college degree*. Lastly, they add new information in the last three sentences that is not found in the speaking data. This increased output in the report constitutes increased language complexity relative to the spoken task performance and suggests these two students were potentially working close to the limits of their language ability (Ellis & Barkhuizen, 2005). Having students work at the limits of their interlanguage is important because it potentially helps students, and teachers for that matter, notice gaps in student interlanguage which ultimately results in more productive language learning (Swain, 1995). While not seen in the extracts, these students during the presentation of their written report received real-time error correction and suggestions for improving the report. Even with an infographic with minimal text like the one used in this paper a task-based learning approach ensures student production and learning is maximized.

A Comparing Task with Authentic Input

The next example is from students who completed a comparing task with the same infographic. If the previous task-based lesson focused on how oral production can be pushed, this task sequence demonstrates how to build rich input into an infographic task. For the comparing task students individually at the pre-task phase (preparing for the task) made a list of what interested them about the infographic. For the main task students listened to an audio recording of two people (both teachers) talking about and comparing their own lists. While listening students individually took notes on the differences and similarities between their lists and the ones presented in the recording. Once they had finished compiling their notes, students then shared their findings with a partner. In the previous task (ordering and sorting) the students provided the input while in this comparing task an authentic audio recording is used to provide input for the students. At the focus on form phase after the task cycle (task, plan, report) this input is analyzed with the students. This form focus phase is where the teacher and students engage in explicit language learning. For instance, with this specific infographic, the phrase *as for* was used three times (including the dropping of *as*) in the unrehearsed audio recording (*as for me, as for my list, for poverty*). In addition, synonyms (*regarding, concerning, about*) for *as for* were each uttered once. Students because of the frequency of *as for* asked for clarification of its use. From this, students also learned about the synonyms used in the recording. It was an important language learning moment with this task. If the students had not asked about the phrase a teacher would want to draw attention to it regardless. This is done by asking students while listening to the recording to note how many times they heard *as for* and where. Or if a transcript is available a teacher has the students find the instances of the phrase including related synonyms. Another language focus that emerged from the audio recording was the utterance launchers that express surprise (e.g., *It amazes me that . . ., I think/find it is interesting that. . ., I cannot believe that . . ., What also stands out for me is . . .*). An authentic recording of someone doing the assigned task can be used for pre-task work, as part of the main task like in this lesson, and for post-task focus on form study. For teachers wanting to know what language will be needed for a certain infographic task or what learning opportunities will emerge all they need to do is make an unrehearsed audio recording of people doing the task to find out. From this recording teachers can determine what vocabulary, grammar and skills should be taught and learned in the lesson.

Focusing on Numerical and Critical literacies

As discussed previously in order to properly understand infographics students need to understand the data as well as the design of it. For university students the numerical literacy required for the infographic in this paper is basic (one percent equals one person). Even though infographics are supposed to make it easier for people to understand data, many still struggle to read them correctly (Cairo, 2019). At a certain phase of a task-based lesson, depending on the difficulty of the data, teachers need to ensure that students can read the actual numerical data. Amar et al.'s (2005) compiled a taxonomy of ten basic analytic activities (e.g., characterizing distribution, identifying extremes, clustering, correlating, filtering, etc.) that people intuitively apply when analyzing data. At minimum this simple list can help language teachers familiarize themselves with the basic analytical activities we engage in when looking at data. It helps teachers identify what data is key in a numerically challenging infographic. One option is to provide students with this list which is also conveniently accompanied with language examples that they can reference when doing infographic tasks. With the list and for the above infographic a teacher can for example ask 'characterizing distribution' questions to his/her students related to age distribution in the world, or population distribution based on continents. Or students can be asked to 'cluster data' based on high ratios (e.g., safe water, literacy). Once students become familiarized with the list the teacher can create simple activities that help the students practice making questions and giving responses about data. Such activities can take place at different stages of the task-based lesson depending on the difficulty and familiarity of the data/information.

As part of developing data and multi-modal literacies, it is also crucial to explore with the students the potential biases of the data and design of the infographic. This can take place before or after the task depending on the difficulty of the infographic. For the lessons demonstrated in this paper students were asked at the report stage to critically think about the data and the design of the infographic and include it in their task outcome reports. Aesthetically, for this infographic students easily identified that the circular design represents the world while the variety of colors convey flags or nations. At a more critical level, many students identified a major bias or distortion of the '100 people as the world' concept. A student in her task report wrote: *It is easier for us to understand than seeing big numbers, but we don't know who the people are and where they live.* What the student points out is that many of the important issues in the infographic (e.g., unsafe water) overwhelmingly occur in the same regions of the world, and that the infographic does not present this important geographical information.

Project Tasks with Infographics

The two tasks and their accompanying lessons described in this paper can be completed in a 60 or 90 - minute lesson. Both lessons have been used as springboards for larger project tasks. A project task is one that involves numerous stages, incorporates various task types, and often requires the students to do some research (Willis & Willis, 2007). For a follow-up project task for both the previous lessons students conducted web searches for reliable sources of information on the availability of safe water around the world (a category in the infographic) to report to the class. Web searches as project tasks can be focused like the safe water example, or open-ended with the students themselves deciding what to further investigate and report on from an infographic. With the safe water web search many students under their own initiative expanded their research by investigating the illnesses caused by unsafe water, and what solutions are available for improving access to safe drinking water. This project task offered excellent language learning opportunities as students in pairs had to do key word searches on the Internet, navigate sites and data in English, use translation software to help scaffold challenging text, verify the truthfulness of their data/information, and finally report their findings to the class where some students even made their own infographics. For another project task students created their own 'my world/country as a 100 people.'

Task: My world/country as a 100 People

With a partner find four to five new categories (e.g., multilingual/bilingual/monolingual speakers, people living in active wars zones, access to McDonalds, eye color, etc.) based on reliable data to report to the class. Document why you decided on the categories and where you located the data, and how you came up with your numbers. Prepare a report and create a simple infographic (you can draw it if you like).

Figure 4. Project task – My world/country as a 100 people.

Other popular project tasks involve ‘translating across modes’ (e.g., oral to written) or what is called transmediation (Mills, 2016). Task-based learning has a long history of using tasks that require students to translate across modes. For instance, changing charts, tables, mind maps, timelines, and storylines into written or oral information or vice versa (Willis & Willis, 1988). Transmediation is not simply the reproduction of content, but rather a process of transforming or redesigning content (Mills, 2016, p. 67). It is also seen an essential skill in multi-modal literacy. The CEFR Companion Volume (2018) lists a number of new scales for transmediating text. For example, one scale is for ‘explaining data in speech’ by transforming infographics into verbal text. With these mediation scales the higher you go up the more complex the visual information is, and, therefore, the more complex the communicative acts become (e.g., describing salient points and details). One such project task involving transmediation is to give the students only the data/information from an authentic infographic, and then have them design/draw an infographic based on the data to report to the class. Once students have finished this sequence students undertake a new task where they compare the similarities and differences between their infographic and the original infographic from where the data was taken. The other option for the teachers is to do it the other way around – students transmediate the infographic into a written or oral version.

Conclusion

The lessons, tasks, and activities in this paper are for A1 and A2+ ESL classes. However, they are applicable to higher proficiency levels. Task-based lessons using authentic infographics seem ideal for Content and Language Intergrated Learning (CLIL) and Content -Based Instruction (CBI) classes. Many language teachers in higher education in Asia are in departments where they are strongly encouraged to offer more content-based language classes relevant to the field (e.g., economic content for economic majors). This can be very difficult if students lack the English ability to study academic texts. Using genuine infographic material makes it easier for language teachers to expose students to authentic content in the students’ field of study while engaging in level appropriate language learning. The recent addition of CEFR descriptors for mediating visual data also provides a strong rationale for English as medium of instruction (EMI) courses in Asia to add more authentic infographic use and analysis into their curriculum. Currently, in higher education interdisciplinary data visualization projects in the classroom involving both qualitative and quantitative data are becoming more popular (see Ferster, 2013). These research projects offer language teachers new directions for developing courses that while focusing on language learning also develop skills in finding data, visualizing it, and designing it for eventual presentation to an audience. These more intensive inquiry-based visualization projects do not require any special expertise or software and can be easily made through tools like *Google Charts*.

The purpose of this paper was to make a case for using authentic infographics in language classrooms. At minimum, infographics are a great way for introducing stimulating topics and accessing content that is hard to do through primarily written text. A deeper justification for warranting their use is that multi-modal texts have become prevalent in daily digital life, and moreover, they reflect fundamental changes in how we present and process information. As language teachers, we should not ignore new digital literacy practices, nor feel that they are a threat to traditional literacy. Rather, we should see them as an important expansion of literacy in our increasingly digitalized lives. The recent pandemic has shown that skills in accessing, analyzing, critiquing, and visualizing data, as well as being able to transmediate

data/information for a larger audience are critical skills in the 21st century. Introducing more multi-modal learning does not require a dramatic shift in classroom practice. This paper has tried to show this by demonstrating how authentic infographics utilized through a task-based learning approach can facilitate language development along with multi-modal skills.

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(Received October 29, 2021; Revised February 24, 2022; Accepted March 18, 2022)