

Preparation of Visual Materials to Study How EFL Learners Use Images in the Learning Process

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Introduction

This roundtable addresses issues in selecting and revising visuals for use in a study of strategies learners use to interpret images in the learning process. The study is described briefly to give context for the discussion of developing these images. It can be difficult to study the role of images in learning at the abstract level, because specific images have to be used to conduct such studies (Grabinger, 1988; Twyman, 1981). The characteristics of those specific images must therefore be considered very carefully. For this study, the images needed to be authentic in terms of their role in a learning task, but also sufficiently ambiguous that they would stimulate sufficient verbalization of the strategies learners were using to interpret them, and therefore generate the data we needed.

The study being conducted was naturalistic in nature, so the experiences that the researchers brought to it are relevant (Glaser & Strauss, 1999). Visuals4Learning is a group of researchers studying how images are used during the learning process. We bring a range of experiences and characteristics to this study. The group includes a native speaker of Arabic, members with experience of Arabic cultures, members with years of experience designing learning materials and materials for teaching English as a Foreign Language (EFL), and members with years of experience in graphic design and illustration.

Context: The Study

Building directly on an earlier study investigating how the intentions of image designers are interpreted by their intended audiences (Boling, Eccarius, Smith & Frick, 2004) the researchers are conducting a study in which learners engage in an authentic learning task, verbalizing their thoughts as they match images to verbal statements. Reviewing literature across decades describing the study of visuals in learning (Spaulding 1955, Smith 1960, Travers 1969, Holliday 1973, Benson 1997), semiotics related to images in learning (von Engelhardt, 2002; Kress, 2004; Sless, 1986; Van Leeuwen, 2001), aesthetics in the design of instruction (Parrish, Wilson, & Dunlap, 2010), message design (Fleming, 1987; Knowlton, 1969; Winn, 1993), document design (Schriver, 1996), and cognitive load theory related to multimedia (Mayer, 2009; Mayer, Hegarty, Mayer, & Campbell, 2005), we have identified a gap in the literature. While it is recognized that learners are active participants in making meaning from images, little is known about the process whereby this happens—specifically the strategies learners use to decide what they are intended to understand from an image presented to

support their learning. Such knowledge could lead to more effective design of such images and improved approaches for helping learners interpret images as they learn. In this study we consider both the morphological and functional aspects of images, and work from a semiotic perspective which views the meaning of signs (images) as mutable and existing between creators and viewers rather than in the images themselves (Sless, 1986).

Development of the images

The original study design involved undergraduate EFL learners outside the U.S., native speakers of Arabic, using instructional materials that required them to interpret images, matching pictures with sentence fragments in order to practice vocabulary words. The learners worked in pairs, agreeing on their choice of images and encouraged to discuss their decision process as they went. This study design was aimed at providing the researchers with insight into the strategies they were using to interpret the images. Analysis was to be conducted using the constant comparative method (Glaser & Strauss, 1999). The existing materials being used in this context contained clip art images with obvious shortcomings, including stylistic inconsistencies, cultural anomalies, and extraneous elements unrelated to their functional roles. We wanted to observe the strategies used by learners without this extraneous cognitive load (Mayer, 2009) which we judged to be associated with such materials, and we undertook to design a stylistically consistent set of images emphasizing the elements required to support their interpretation in the context of this activity.

Logistical factors led to a shift of venue; we are currently using the same learning activity and the revised image set with Arab students attending an Intensive English Program (IEP) at Indiana University and native US speakers of English attending an Intensive Arabic Language program at the same university. Based on the pilot sessions overseas, our protocol has been extended to include direct questions about learners' decision-making strategies, what they believe the designer of the images intended for them to understand from the image, and how they might have improved the image. These extensions are aimed at eliciting more explicit statements from the learner's concerning their strategies for interpreting the meanings of these images.

Discussion

In order to prepare the revised set of images, we used three lenses simultaneously. These comprise the lens of message design (Fleming & Levie, 1993), the collective experience of the group members who have worked professionally in visual design, instructional design and EFL materials design, and the cultural knowledge of group members who share linguistic and cultural backgrounds with the prospective learners. The redesign of the pictures was intertwined with selection of activities that we considered authentic to language learning and that we hoped would require some effort at interpretation on the

part of the participants in order to reveal their strategies as much as possible.

Selecting and adjusting activities that were authentic and required interpretation of images proved to be challenging.

Reviewing eight workbooks from the original learning context, we recognized that many of the activities they contained did not actually require the learners to interpret the images. The process of elimination could be employed easily for many of these activities, and in some cases the use of images was incidental to the verbal component of the activities. Eventually we took items from multiple exercises and regularized the verbal components of them to create one eight-item activity.

In selecting these items, we made an effort to include image content that might require differentiation in order for students to match them correctly to vocabulary words. For example, we found two activity items that referred to someone sitting and we selected others that did not reference sitting but for which the image depicted someone sitting. We selected more than one item in which the person depicted was female, and more than one in which a specific environment critical to the correct interpretation was depicted (see Figure 2).

The illustrations in the existing, authentic materials appeared likely to mask the data we were seeking because of their shortcomings.

In different language, but in the same vein as Mayer (2009), Lawson (1997) states that artifacts when read by a viewer contain both intrinsic and extrinsic forces. Therefore the role of the designer is to develop artifacts that are most familiar to the visual culture of the viewer to reduce extrinsic force and enable a clear communication. We wanted to create an activity that would illuminate participants' strategies for reading visuals, not a tool for revealing effects of extraneous cognitive load or of confusing cultural connotations. The opportunistically chosen images in the original materials contained multiple visual cues extraneous to the learning process, and visual elements at odds with the cultural experiences of the learners. For example, the item in which students were to identify "a look of concern" was illustrated with line art depicting a goat, seated with legs splayed, regarding his image in a hand mirror. An illustration for the vocabulary word "annual" in this workbook for Muslim students depicted a decorated Christmas tree.

We determined that these images, while authentic to that context, would reveal to us primarily confusions that we could anticipate in advance and that we would need to redesign them in order to elicit data regarding interpretation strategies. In this redesign we stuck to the original items and the core content of the images as much as possible, with the exception of the goat image for which, after much discussion, we finally substituted a young woman. We felt this substitution was required in order to reduce the chance that students would interpret as designer intention aspects of the image which had likely

been the result of a materials developer simply not finding anything more apropos.

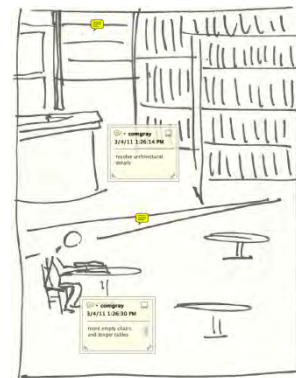


Figure 1. Evolution of illustrations showing the original clip art used for authentic materials, pencil sketch for redesigned graphic with group discussion notations, and final image based on collaborative input

Stylistics and message design principles were employed to create a set of images that exemplified our best knowledge regarding input factors.

After pulling together the set of items that would comprise the activity to be used in our study, we discussed the original images as a group. This first discussion focused to a large extent on cultural factors—clothing, settings and actions that would be both recognizable and acceptable to individuals raised in an Arabic culture. For example, the male figures appear in the thobe, traditional and contemporary dress for men, and the female figures

appear in modest dress. The settings were researched on the internet to verify recognizable environments for classroom, library and site for blood donation. We discussed hairdos, objects, furniture and carpets. While these are not exaggerated in the final images, each element of each image was considered in some detail.

Following this review, we created a set of sketches for redesigned images and again reviewed the images as a group with each member adding insights from various areas of expertise (see Authors bio information below). This was a crucial step because the sketches showed us a concrete version of the ideas we had discussed previously and gave rise to additional concerns and understandings. For example, the goat image, in spite of the fact that we had researched an appropriate breed of goat for the part of the world where the study would be conducted, simply did not lose its somewhat ludicrous aspect and we decided at this point to substitute a human being in that image. Environments were refined, including the library (see Figure 1), to conform to somewhat canonical view for this group of students.

Finally, we created a set of line drawings, in accordance with Fleming (1987) and Mayer's (2009) recommendation to present simple images that convey the intended meaning without introducing unnecessary elements through too much realism or unconsidered embellishments. The images were created to be consistent in visual treatment (line quality, depiction of facial features and other forms, amount of detail, dark/light areas of the images, indicators of depth and so on). These we reviewed again, using our collective perceptions and judgment regarding nuances like the possible age of the young girl depicted in the classroom in image "E" (would she contribute to the interpretation of this as a classroom, or did she look old enough that this image might be construed as depicting a woman in a business meeting?), and the potential for confusion in identifying the MP3 device in image "G." A final set of small revisions completed our process.

Conclusion

It was instructive to us as a group of researchers how much attention and effort was required as we dug into these images to arrive at a set that conformed to our needs and goals. It was quite clear that the images from the authentic materials were lacking from an instructional standpoint and that they would not serve our research purposes well. However, it was much more difficult to decide what we would consider to be a set of images optimized for interpretation and for illuminating students' interpretations. Guidelines from the literature are helpful on a gross scale, but did not tell us what to do when it came to the specifics of creating this image set for this purpose. We relied heavily on our combined professional experience for those decisions.

We also faced the dilemma that students *are* frequently trying to interpret the images they are shown in situations where those images are *not* optimized—this is

often the authentic case. For our research, we had to choose between employing total authenticity, or making an effort to create a defensible set of images in terms of known principles and best practice and using those as our starting point. Hoping that the outcome of our study will take us beyond the message design and cognitive load principles available now, and into the realm of semiotic appreciation for the unknowable contribution to interpretation brought to materials by students, we have opted to start from images that use these principles and build from there.

Authors

Authors are listed alphabetically with the faculty lead for this research listed last. All authors except the last are students in the PhD program in Instructional Systems Technology at Indiana University; Howard is a doctoral candidate. All are members of the visuals4learning research group lead by Elizabeth Boling.

Abdullah A. Altuwajiri is from an Arabic background and taught English in Saudi Arabia for two years.

Colin M. Gray has over 10 years experience as a graphic designer and four years experience as an instructional designer.

Craig D. Howard holds an MA from Teachers College Columbia University in TESOL and applied linguistics, has taught ESL/EFL for 10 years, and worked 5 years in educational publishing and studies interventions which focus on developing learner discourse.

Jiyeon Jung is a former teacher and an instructional designer with experience teaching Korean K-12 EFL students as well as designing and developing online English content for EFL students.

Micah Gideon Modell has two and a half years of experience as a teacher of English as a foreign language and four years as a professional Instructional Designer.

Cagri Yildirim is bilingual in Turkish and English, holds an MsEd in Art Education and Museum Studies. She has 2 years of experience developing instructional materials for K-12 classrooms and museums.

Elizabeth Boling is professor of Instructional Systems Technology at Indiana University; she spent 15 years practicing design for interactive instruction, including ten as an illustrator for print and interactive instruction, and now studies visuals for instructional materials, design practice and design pedagogy.

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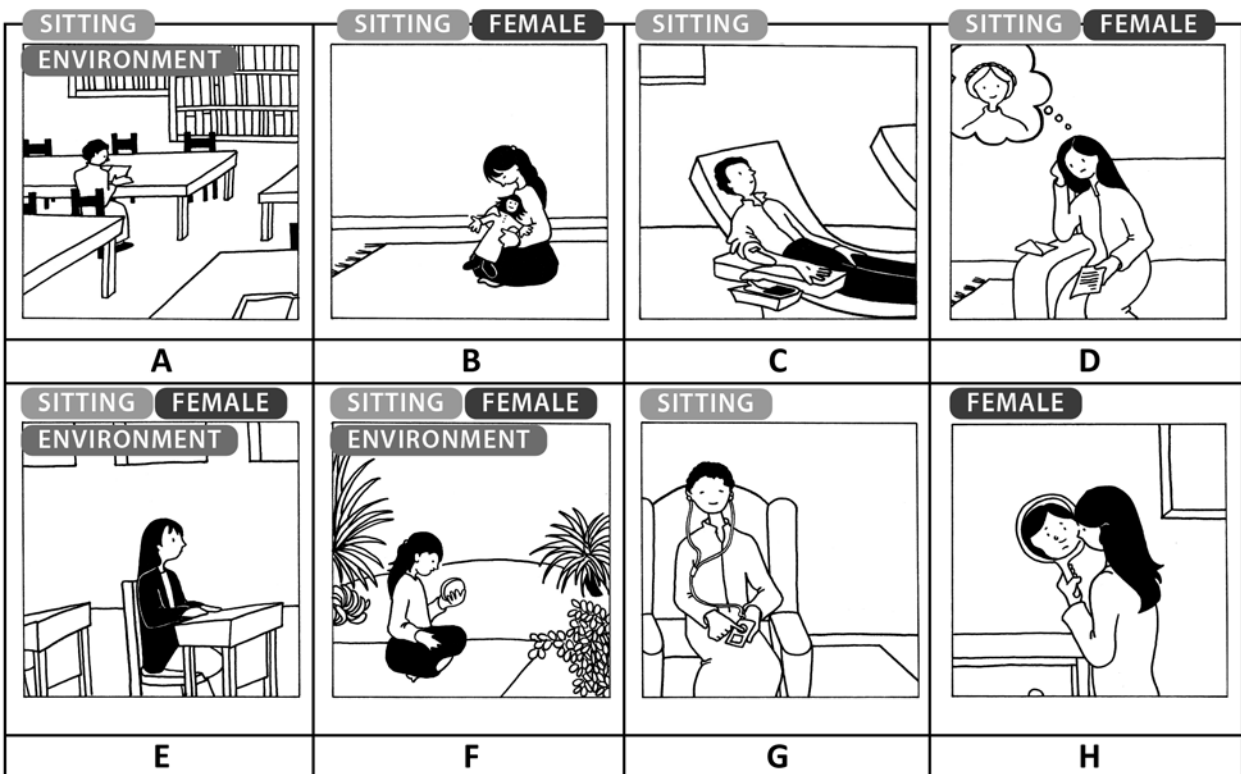
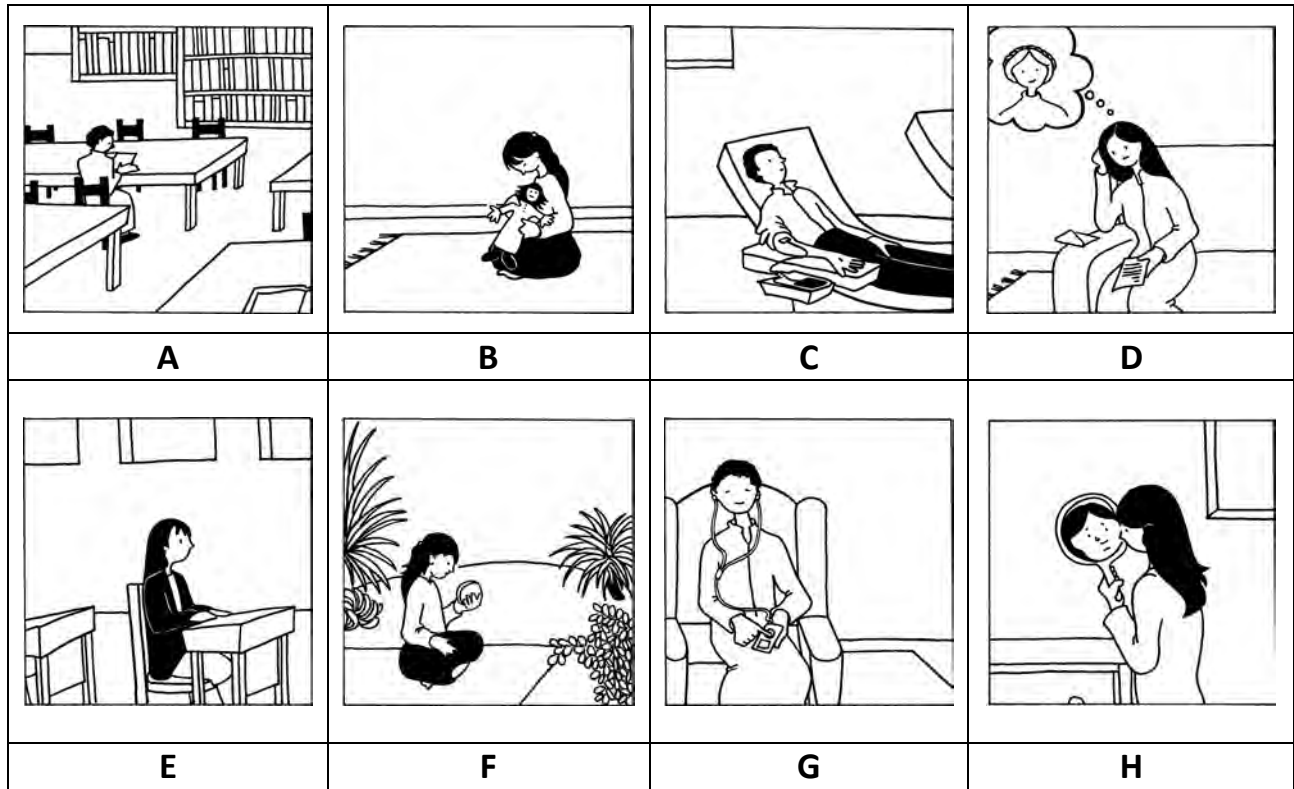


Figure 2. Themes identified across images (people sitting, females and specific environments relevant to the verbal component of the learning task).

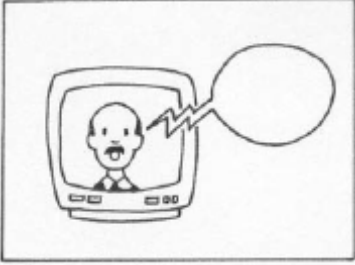
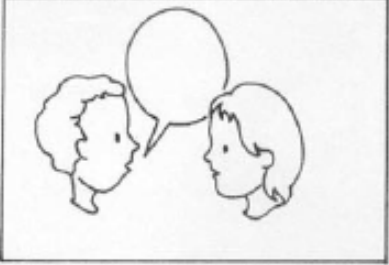
Activity 1 Look at the pictures and answer the questions.



Which picture shows:

1. someone giving **blood**? _____
2. a girl who is sitting on a **floor**? _____
3. a girl who is sitting in a garden? _____
4. a **pupil** in a classroom? _____
5. Which picture shows a look of **concern**? _____
6. someone listening to something? _____
7. a **library**? _____
8. someone who is **missing** someone? _____

Warmup Activity: Look at the pictures and answer the questions.

	
A	B

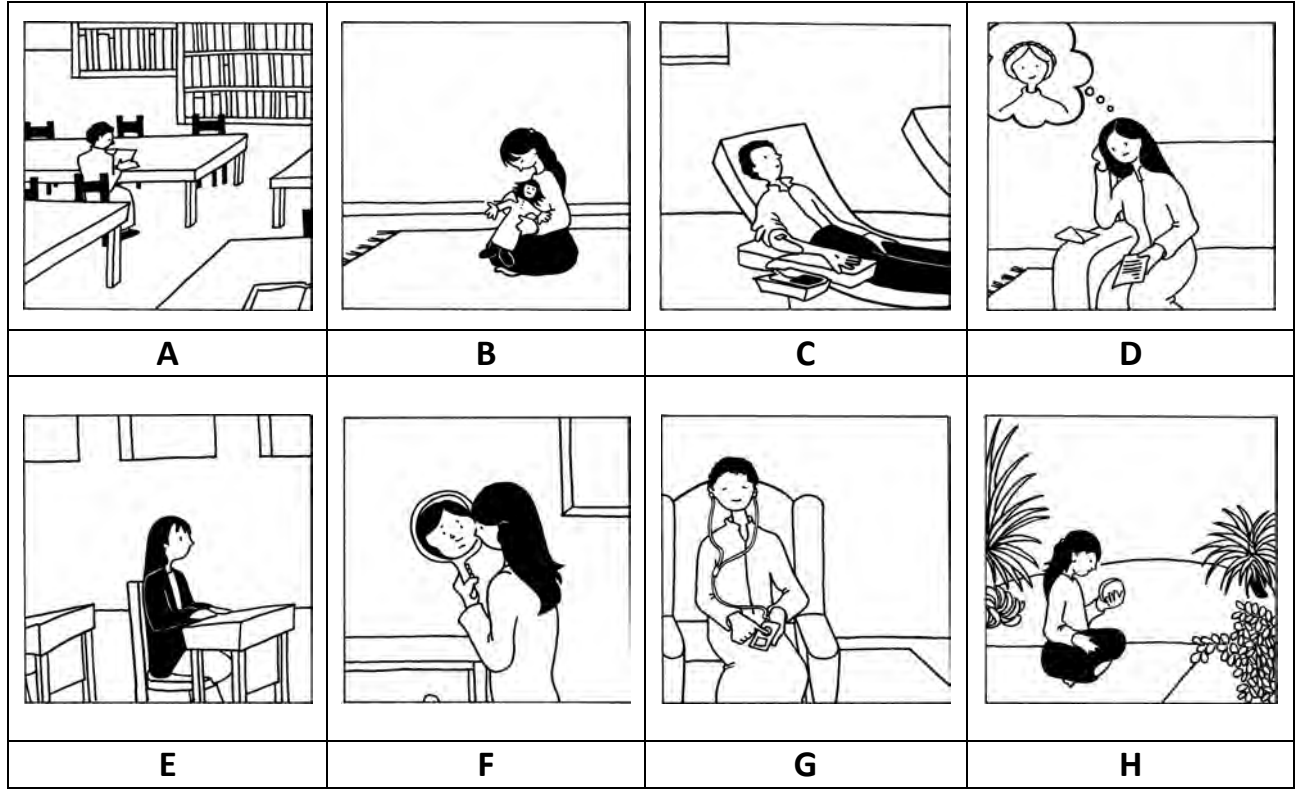
Which picture shows:

Someone telling a story? _____

Someone reporting the news? _____



١: انظر الى الصور واجب على الأسئلة.



اي الصور تظهر التالي:

١ - شخص يتبرع بالدم؟

٢ - طفله جالسه على الارض؟

٣- طفله جالسه في الحديقة؟

٤- طالبة في الفصل الدراسي؟

٥ - أي الصور تظهر نظرة قلق؟

٦ - شخص يستمع لشي ما؟

٧ - مكتبه؟

٨ - شخص يفتقد شخصا ما؟
