Strategies and Methods for Creating an Educational Computer Game that Teaches Idioms

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Abstract
This paper will outline the key educational design features of a particular computer game, *Idiomatico*, that teaches idioms. The paper aims to give insight into some of the reasoning behind the features chosen for the game, and how this is intended to improve the learning experience.

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Introduction

Idioms are a type of multiword construction. They are also lexemes because the set of words in an idiom form a semantic word. A particular problem with idioms is that the individual words comprising the idiomatic phrase cannot be interpreted literally, so it is unlikely that the meaning can be guessed. Instead, the metaphorical meanings of idioms must be learned. This process can be aided by an understanding of the conceptual basis that it originates from (Holme 2009). It important to learn idioms because they often have a stronger meaning than literal words (Cambridge Idioms Dictionary, 2006).

Idioms are low-frequency in nature, and are estimated to belong in the 5000-7000 word level for upper-intermediate to advanced learners. Since they occur infrequently, idiomatic phrases are unlikely to be learned incidentally and need to have conscious or explicit attention placed upon their acquisition (McCarthy, O'Keefe, & Walsh 2010). The computer game in the study, *Idiomatico*, is an attempt to support this process of learning. The aim of *Idiomatico* was to expose learners to idioms, expose learners to possible similarities contrasts between their own L1 metaphorical associations and English metaphorical associations increase player's self-awareness of their own knowledge and recall processes, and motivate learners. These will be explained under their relevant sections later in this paper. First, there will be a brief explanation of the gameplay.

Idiomatico **overview**
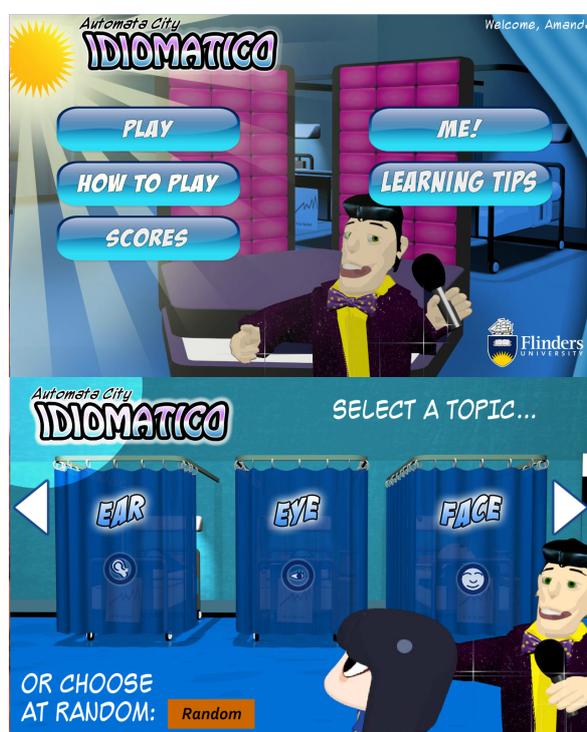
The gaming action of the *Idiomatico* game is as follows. The learner is presented with a sentence that uses an idiom, and they must choose from three possible answers. When they make a selection, they are asked to rate how certain they are (i.e. not sure, pretty sure, definite). If a player chooses the 'definite' option and they are right, the

idiom is removed from their database until there are no idioms left in the game for them. The students are also given a score which depends on their certainty level and if they were correct or not. There are over 500 idioms in the database, and since the game was first designed for nursing students, these idioms all relate to body parts or health idioms – note that about 1/6th of all idioms refer to the body (Kovecses 2001). There are a number of avatars available in the game, and players have access to instructions, tips, and a score leader board.

Game design features that increase exposure to idioms

Any game which deals with idioms will provide some form of exposure. However, the nature of the exposure is important. In the case of *Idiomatico*, exposure is gained through both spoken and written input. The spoken input is provided by native English speakers of different ages and gender. The speaker was randomly allocated, so the learner does not know what type of speaker they might hear for each sentence. Furthermore, the idiom is said before it is displayed in text on the screen, providing an opportunity to concentrate on the spoken form and compare this to the written form. It is intended that the learner has the opportunity to hear prosodic information, such as where the word stress might be placed. The written input involves presenting the idiom as a part of a whole sentence. It is not presented like it was a dictionary entry, which is quite artificial. While presenting the idiom within a sentence means that some of the technical information is lost, it provides a contextualised example of the idiom in use. Furthermore, in keeping with the avoidance of formal dictionary entries, the possible answers offered to the learner are also in sentence form. Within the sentences, the simplest words are selected over their more complex synonyms, since unknown vocabulary could detract attention from the focal idiom.

Game design features that give exposure metaphorical L1 and L2 similarities and contrasts

A key element in the *Idiomatico* game lies in the process of how wrong answers are formulated. It is relatively easy to give correct answers, but the formation of highly distracting incorrect answers is very difficult. This task is even more difficult when the question-writer is steeped in one culture and has no long-term immersion experience of other cultures. Sometimes misunderstanding of an idiom might stem from a literal interpretation of a single word within that idiom. However, it is just as likely that misunderstanding of idioms occurs because the things being referred to in the L2 do not have the same associations in the L1. Idioms are essentially metaphors that capture a cultural worldview. Therefore, it was decided that the wrong answers needed to be generated from a range of responses given by target students from China, Japan, and Korea (who comprise most of the international students in the school that created the game). These students also had to be at a stage of language skill just below that of the target cohort, because their interpretations would tap into any lingering problems that were being seen at a higher level. Thus, a group of learners were hired to make guesses at the meaning of each idiom, and they were encouraged to translate the words back into their own language to make sure that guess was formed from their L1 cultural understanding (as much as possible). Note that this process could also be achieved by collecting a bank of wrong answers from students doing an idioms test, but this facility was unavailable to the school making the game.

After collating the right and wrong answers, they were refined into a format suitable for the game.

The intention was to highlight the contrasts between the L1 and L2 metaphorical conceptualisations, albeit in a generalised way because some answers (e.g. Chinese-sourced) would appeal to particular learners (e.g. Chinese learners) over others (e.g. Japanese learners). If the game was coupled with classroom teaching about general cultural associations about the idiom categories of the game, it would enhance learning greatly.

Game design features that increase player's self-awareness

The use of certainty-based marking increases a learner's declarative knowledge for idioms. The certainty-based marking in this game gives 50, 100, or 150 points to correct answers, depending on whether the learner rated their certainty as not sure, pretty sure, or definitely. If the learner's answer is incorrect, they lose 0, 100, or 300 points, also depending on how they rated their certainty. At the point when the learner chooses their certainty level, there is no time limit. They can review their choice more carefully while making that decision. This gives them thinking time which is meant to improve self-awareness. By reviewing what they know, how they know it, and elaborate on this, they can develop theories about what they have learned and how they remember it. The more effort a learner puts into learning a new item's meaning, the more likely they are to remember it (Godwin-Jones 2014). Better learning occurs when effort is put into both trying to learn what something means and then how you remember it later: students must "relate new information to what they already know, organize it, and regularly check their comprehension" (Bruning, Schraw, & Norby, 2011, p. 6). In a way, this process is similar to teaching, where you have to think through the process and explain what you know, except that the learner explains to themselves.

Game design features that motivate learners

One motivating factor for students to interact with the idiom content is the game's use of a time limit on choosing an answer. Placing a time limit on solving a problem encourages better learning (Chappelle 2001). The second motivating factor is the use of a scoring system and a scoreboard. Learners like to improve against their own high scores, and some are very motivated to beat the high scores of others. Scores give a student a goal to aim for − one that is more tangible than an abstract increase in vocabulary knowledge. It can encourage discussion, research, and focused learning about idioms outside of the game, because learners will see it as a means to getting a better score and more prestige.
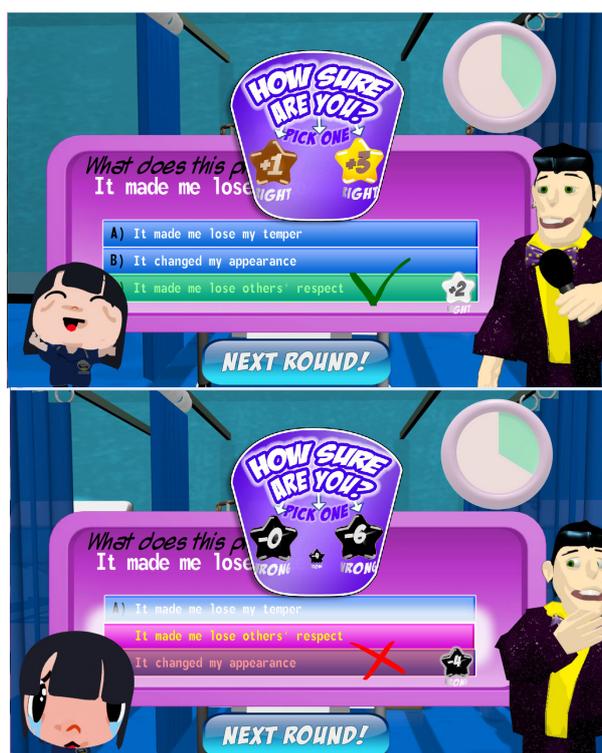
Another motivating factor in the game is the use of avatars. In this case, there is a small selection of avatars that represent gender and ethnicity. Since the game is designed for nursing students, the avatars all wear the standard nursing uniform for their school. This helps them identify with the avatar and connect with the game. Watching and manipulating the avatar helps make them think about how others view them and how they might control their own actions. The other factor designed into the game is the range of emotional reactions given by the avatars. They look like they are seriously thinking when an answer is needed, cheer when they get an answer correct, and cry when they get an answer wrong. This emotional involvement has been shown to affect the learner, motivating them to get correct answers (Müller and Habel 2012). The gameshow host in *Idiomatico* also has a range of responses too, but these are in response to the avatar. The game also has a number of sounds which play at different stages of the game, such as a ticking clock sound when selecting an answer, an applauding audience if a correct answer is given, and pleasant interlude music.

Conclusion

The paper explained a number of the features that comprise *Idiomatico* and it should be clear that when a videogame is created, there are many opportunities to value-add to the educational possibilites. As explained, this game was created with a number of important features in mind. These included the use of audio input and feedback using different voices and sounds, the use of realistic sentences and distractor answers, the questioning of the learner's certainty levels, the display of a range of emotional responses in an avatar which was designed to elicit empathy and identification, and finally giving a score and scoreboard for everyone to see. Creating an educational game is much more than just thinking about the gaming action. There are many opportunities to refine a game to ensure that learners are both motivated to learn and have the sufficient input to improve their knowledge. Hopefully, this paper has given some insight into one way this might be achieved.

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