

Persuading Giants to be Wise: An Exploratory Study of Advice Sharing in Online Games

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Abstract

This study investigates the effects of a browser game as a motivational factor for the sharing of short written reflections. We have analysed 400 anonymous written reflections and conducted 10 interviews in order to get a deeper insight of the game experience. This is an opportunistic investigation and the authors did not have control over the game environment. We have found that there is a predominantly positive attitude towards the approach taken by the game, and a significantly higher level of contributions from participants, as compared to a recent investigation of contributions in social awareness streams. A number of user contributions that clearly do not match the game intentions are being reported and discussed. We draw the conclusion that persuasive tools and techniques can be employed within personal learning environments in order to guide learning. The paper makes a strong argument by example for the use of browser games as a persuasive tool in informal online learning.

Introduction

Informal learning takes place throughout our lives. In recent years it has been boosted by worldwide connectivity. However, the outcomes of such learning are open-ended and – under the pressure of distracting factors – could diverge in an unwanted by the learner direction. That's why possible ways to reinforce the focus of this learning are of interest. One possible response could be the utilization of persuasive technology, as defined by Fogg (Fogg 2002) to engage people in learning. Computer games feature a number of persuasive techniques identified by Fogg's framework. Moreover, a number of researchers (McGonigal 2006), (Ryan et al. 2006) and game designers (Wright 2009) argue for the value of games as a motivational tool. Historically, a number of entertainment games (*Civilization*, *SimCity*, *Sims*, to name a few) have been recognized for their contribution in informal learning. However, despite a widely proclaimed alignment of instructional games with constructivist traditions (Kebritchi & Hirumi 2008), there is only partial – and with limited transferability – evidence of actual learning with games (Hays 2005). A survey by IBM and Seriousity (Reeves & Malone 2007) demonstrates that players in virtual worlds acquire leadership skills that are transferable to real-life situations. The team behind the survey points out that breaking assignments in smaller pieces is helpful for promoting leadership. In their focus on development of leadership skills they also notice the usefulness of Web 2.0 tools in general. Social platforms like *Wikipedia* and *Delicious* are known for successfully promoting knowledge sharing. There are also examples, e.g. *Sermo* (Bray et al. 2007), of living knowledge ecosystems adopting Web 2.0 tools. *Sermo* features surveying, tagging, discussions and rating among other techniques. The collectively constructed practical knowledge, developed within that community is a product that has been considered to be of commercial value.

Written reflections have been recognized as a valuable learning tool (Moon 2001). They apparently feature benefits for the viewers, but also for the contributors, who externalize and thus reinforce their knowledge. Moon, among others, emphasizes on the importance of human guiding in the reflection process. A number of researchers give evidence that in educational games the process of reflection after the game is essential, an aggregated analysis has been done e.g. by Hays and colleagues (2005). Similar to the aforementioned case of breakdown of tasks (Reeves & Malone 2007), an argument supporting the advantages of shorter written lessons can be developed. Two advantages of short over long texts are that shorter contributions effectively reduce the threshold for participation and that short texts may be

easier to transfer between people, as their shortness may lead to relatedness to less context.

Individual differences have been subject of discussions among educators for many years. However, mainstream research in technology-enhanced learning has traditionally attempted to accommodate such differences in the design of tools that are being developed. A drastically different approach to overcome this problem has been taken by researchers, advocating personal learning environments (Attwell 2007). According to them, personal learning environments have the advantage that they allow learners to choose and organize their own learning tools and process (Wilson et al 2006). This comes hand in hand with a recognition that learners benefit from more than one learning provider. In line with the aforementioned reference to social platforms, such platforms and social awareness streams (most notably *Twitter*) in particular have been recognised as one of the key elements of personal learning environments (Kompen et al. 2009).

Numerous authors have considered social awareness streams as valuable for networking and learning purposes in a specific context (e.g. as a backchannel for conferences, see (Reinhardt et al. 2009)). In a recent analysis of content on *Twitter*, Naaman, Boase and Lai (Naaman et al. 2010) examine how people use the social platform. They find out that active users can be considered to fall in two categories: 20% that share valuable information and the authors call informers and the remaining 80% - meformers (people posting "me now" type of statements). As for tweets themselves, Naaman and colleagues report 22% of the messages they analysed were some form of sharing information. Their study did not attempt to measure transfer of that information to potential readers.

With this paper we are aiming at investigating the effects of games as a motivational tool for people to engage in a mutually educative online reflection-sharing process. The knowledge, being shared in the investigated environment, is communicated in the form of short written pieces of advice. The tool and environment that enables this is an art game, called *We the Giants* (playable online at <http://wethegiants.thegiftedintrovert.com>) that focuses on persuading people to leave a general advice. As part of the game, players share short statements that are anonymously published on *Twitter*.

In this paper we gradually introduce the process that we have adopted. In the next section the study and its general method are being explained, as well as the game environment that has been examined in it. In the following sections we explain the specific coding and interviewing procedures, used for the purposes of the study. After that we describe the outcomes with examples from the analysed data. Finally, in the conclusion, we summarize our findings and conclusions and, as much as possible, compare them to previous research. In that section we consider also limitations of the research and possible continuations.

Study

This paper reports an instance of opportunistic exploratory research of a browser game that features similar design elements to *Twitter* and even integration with it. Both qualitative and quantitative analysis techniques have been used. This investigation employs some techniques from content analysis (Weber 1990). The purpose of the study is to explore the effectiveness of that particular game as part of a personal learning environment.

The game used for this study is called *We the Giants* after the famous phrase "Standing on the shoulders of the giants". It has been developed for a competition on experimental gameplay under the topic of art games. The overall walk-through of the game from beginning to end takes less than five minutes. Players are taken through several levels where in the form of dialogue they are introduced to the rules and the goal of the game. By the time this tutorial is over, players have been shown that the purpose of the game is to sacrifice their game characters in a symbolic collaborative effort to reach a star far in the sky (see figure 1d). When committing that sacrifice, each player shares a statement (called an "advice" in the game) that is being published anonymously on *Twitter*. The game is persistent: it does not allow replaying, once someone has committed a sacrifice. In that way users get the chance to share an advice only once. In all pieces of advice, quoted in this study, the original

spelling is preserved in order to demonstrate the ambiguity that this has caused.

Although the web-based nature of the game makes human guiding challenging, it employs various techniques to encourage players' full cooperation in the knowledge sharing process. These include quotations from historical figures, guiding and tutoring by the non-player characters in the game and the symbolic representation of mountain of people trying to reach a star (all these can be seen in figure 1a to 1d respectively). Among the various forms of in-game guiding and tutoring, information

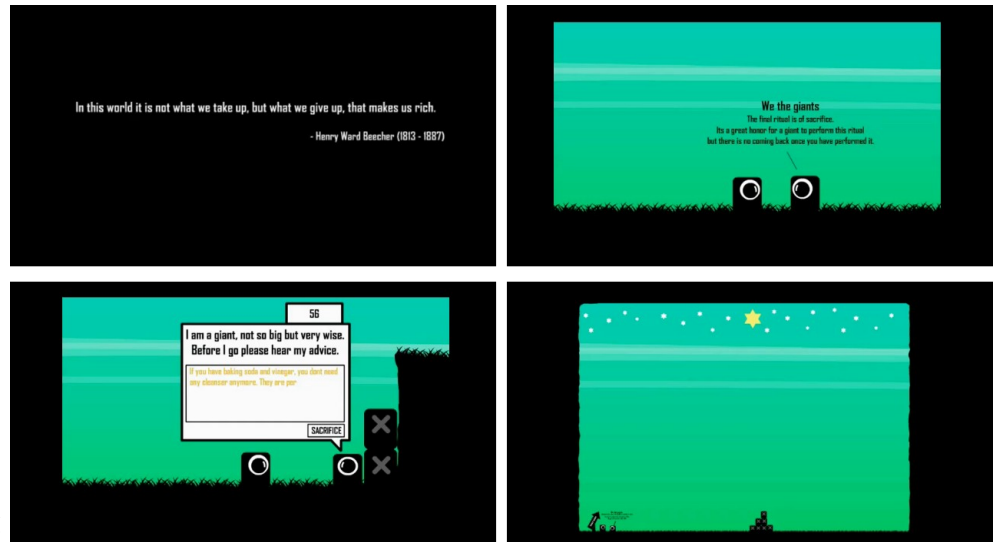


Figure 1: Four screenshots from the game. From left to right, then from top to bottom: a) A mind-setting quote from a historical figure; b) Guiding by non-player characters; c) A performed example (tutorial) by a non-player character; d) The final stage with accumulated previously sacrificed player characters and the star in the sky.

delivery, worked examples and request for player confirmation can be easily identified. The game shortness and simplicity allow for speculations on direct cause-effect correspondences. Last, but not least, it is a convenient fact that the topic of the example in the game differs from the actual game theme. This allows analysis to try to match specific outcomes with the possible motivational elements that have caused them. However, various research indicates that segregations of this kind undermine learning potential (Kalyuga et al. 1999). Because of the importance of alignment of various forms of cognitive support, it is worth noting that the game name, game world and used quotes all might be considered to encourage considering deeper philosophical topics, whereas the example advice was rather pragmatic.

In order to give insight of our early impressions from the game, it should be noted that potentially there exist several topics that people might want to reflect or comment on. Beyond sharing an advice, this might include for example topics about the game mechanics or content. When players are strongly affected by such thoughts, sometimes their need overshadows any designer intentions and players end up using the advice input form (the only available backwards communication channel) to express that. Also, it is worth noting that in our analysis, we have identified a number of advice that were mimicking the specific example, given to all players in the game itself. It reads "If you have baking soda and vinegar, you don't need any cleanser anymore. They are perfect cleaning item." Similarly, there were instances, mimicking a sentence reoccurring in utterances of non-player characters within the game ("We the giants, not so big but very wise"). In this study, we are also interested in such phenomena and have attempted to take them into consideration as well.

For this study, more than 3000 anonymous entries from playing the game were collected within two months. Word frequencies in the whole collected sample have been used as an indicator of topic distribution within the whole data set. Out of this data, a sample, consisting of 400 randomly selected advice have been coded, in order to probe for their relationships with the game content and presence of potentially valuable knowledge to be shared. Subsequently 10 interviews about the game experience were conducted. The participants in these interviews were presented the game without prior introduction as the majority of online players is playing it. After a two weeks period, the interview

participants were approached again to examine potential retention of advice.

We have considered *Twitter* to be a baseline of short message interactions. Therefore written statements from the game have been compared to similar data in *Twitter*. Due to the nature of this study, no definitive conclusions can be declared, but rather the results of this research should serve as an indication of the existence and potential of the investigated phenomena. Any attempts to extract certainty solely from the outcomes of this research, could be distorted by possible introduction of biases from the uncontrolled selection of participants and their initial motivation, previous knowledge and specific context during participation, among other factors.

Methods

This paper addresses the following specific questions in the context of that game:

- Is there evidence of high involvement of players while playing the game?
- How does the game environment influence generated reflections?

In order to be able to investigate these, we have coded the collected pieces of advice, according to several dimensions. To directly address the posed questions, we have introduced the following several dimensions: attitude towards the game, class and transferability of advice, reference point, indexicality and interpretation. Several independent labels were used to code each of these general dimensions in order to avoid making assumptions about possible interdependencies between the labels. The specific dimensions and labels chosen are explained below.

Because of risks, derived from coding ambiguity, we have coded advice with both positive and negative labels for the purpose to identify player attitude towards the game. These might be directly indicated by the advice (e.g. “*Awesome*”, which was one of the actual collected pieces of advice), but we also coded apparent collaborations to represent positive attitudes and dislike type of statements and swearing to represent negative attitudes.

We introduced three coding labels to classify the given advice, according to their advice value. This was motivated by the aforementioned diversion between worked example and other employed supporting techniques:

- general wisdom, when the advice refers to a global context and can be transferable
- philosophical, when it elicits deeper philosophical beliefs of the person, who has shared it
- practical advice, when it is of pragmatic value and can be directly applied. An example for this is the sample advice, provided by the game

Furthermore, after the pilot coding, we introduced one more codes to represent to what extent the advice could be perceived as lessons, i.e. something that is valuable to learn. The reasoning behind this was that advice might be clearly in one of the aforementioned three categories, but they still might not add learning value to a reader.

We also tried to evaluate the type of knowledge being shared through introducing two more (again not mutually exclusive) codes: indication of subjective applied knowledge, labelled soft-skills (e.g. “*Wait a few days.*”) and statements that could be generally considered as universally truthful (e.g. “*What you leave behind can be very important to others.*”). Arguably more than other codes, these two were heavily influenced by the particular formulation that was employed when the advice was shared.

The game provided a great opportunity through the fact that there is a notable distinction between the game topic: standing on the shoulders of the giants; game world: simplistic characters (not so big) and reaching out for the star; and provided example: salt and vinegar as a cleansing item. This allowed us to classify responses according to the reference point that they assumed, as long as that was obvious from the response.

In a game environment, some people tend to identify themselves with the game character and to immerse in the gaming world. That drove us to consider the indexical dimension of advice, i.e. to what extent player's advice were dependent on the context of the situation. For this purpose, it is looked at, whether the actual people participants or environment are being addressed and whether the advice will change its meaning in a different context.

For technical reasons, we have also introduced two codes, denoting when the advice were difficult to interpret and when we were able to extract any meaning out of them at all.

It should also be noted that the nature of given advice and the complex constructs that are being sought for make the interpretations for the coding highly subjective. However, due to limited resources, we haven't made the additional effort to validate the coding by a second independent human coder.

	difficult	meaningful	positive	negative	general wisdom	philosophical	practical	context specific	truth	game	topic	example	lesson	indexical	title
X	V	V	X	X	X	X	V	X	X	X	X	X	X	V	i wonder how many more blocks
X	V	V	X	X	X	X	X	V	X	X	X	X	V	X	2+2=4
X	V	V	V	V	X	X	V	V	X	X	X	X	V	X	oil and water do not mix.
X	V	V	X	X	X	X	V	X	X	X	X	X	V	X	American teenagers are far more ignorant than they think they may be.
X	V	V	X	V	V	V	V	X	X	X	X	X	X	X	dreams are just goals without plans
X	V	V	X	X	X	X	V	X	X	X	X	X	V	X	Don't read popular science. Read Scientific American instead.
X	X	X	V	X	X	X	V	X	X	X	X	X	X	X	woor
X	V	X	X	X	X	X	X	X	X	X	X	X	X	V	GRIEF
X	V	X	X	X	X	X	X	V	X	X	X	X	V	V	all your base are belong to me
X	V	V	V	X	X	X	X	X	X	X	X	X	X	X	k
X	V	V	X	V	V	X	X	X	V	X	X	X	V	X	life is to be savoured
V	X	X	V	X	X	X	X	X	X	X	X	X	X	X	C-
X	V	X	X	X	X	X	X	X	X	X	X	X	X	V	three
X	V	V	X	V	V	X	X	V	X	X	X	X	V	V	All those moments will be lost in time, like tears in the rain. Time to die.
X	V	X	X	X	X	X	X	X	X	X	X	X	V	V	I'm hacking the system.
X	V	V	V	V	V	V	V	V	V	V	V	V	V	V	What you leave behind can be very important to others.
X	V	X	X	X	X	X	X	X	V	X	X	V	V	V	saved
X	V	X	X	X	X	X	X	V	X	X	X	V	V	V	sacrifice
X	V	V	X	X	V	X	X	X	X	X	X	X	X	X	We are always the same age inside.
X	V	X	X	V	V	V	V	X	X	X	X	V	V	V	Fool me once, shame on you. Fool me twice..? u can fool a fool twice.
X	V	V	X	V	V	V	V	V	V	V	X	X	V	V	I have no obligation to man.
X	X	X	V	X	X	X	X	X	X	X	X	X	X	X	34sedrtfzguhio

Figure 2 illustrates an excerpt from the collected advice and its coding. This is a screenshot from the actual dataset.

Figure 2: An excerpt of the coded pieces of advice. Above are various the code labels; to the right are several sample advice and to the left are the assigned codes: V for indication of the presence of the code in the particular advice; X for its absence.

Subsequently, interviews were conducted with the intention to get a deeper understanding of player experiences and the possible motivation behind various types of responses. These interviews allowed us to get a partial deeper understanding of some, though not all, interesting cases of advice-sharing. However, they need not be representative for all contributors.

Results

None of the words that showed up in the resulting advice has a frequency above 3% of the entire data sample (of all 3000 collected advice), so it is safe to assume that the employed motivational techniques didn't introduce an extremely strong bias towards some specific topic. Still, there are several reoccurring words that are worth noticing. We have grouped the most frequent of them, according to our interpretation as follows:

- Advice, directly inspired by the game world and mechanics and featuring words like *star*, *blocked* (has to do with situations that might occur during the final reach to the star), *giant*, *sacrifice*, *advice*, *big*. It may be further noted that in general these correspond to advice that in the coding were labelled either as related to the wisdom-of-the-giants topic, or to the game world.
- Ones directly related to the example for advice, given in the game: *baking*, *cleanser*, *cleaning*, *vinegar*. Most often these are full or partial mimicking of the advice.
- Meta-game references, often implied by words like *help*, *game*.
- Wordings possibly inspired by the game theme: *life*, *die*.
- Several other topics that might have a relation to the game, indicated by words like *better* or *best*.

- There were a number of words that could be related to general topics, not directly inspired by the game, but often with philosophical implications, e.g. *love, day, time, world*.
- Swearing, considered to be unrelated to the game, but commonly expressing dissatisfaction.

Out of the around 400 coded advice about 36% could be perceived as actual lessons and around 39% as indexical statements. 65% were assigned at least one of the codes that could be classified as a form of information sharing (general wisdom, philosophical, practical, soft-skill, truth and lesson). Close to 16% were meaningless strings. Partially overlapping with these, out of all analysed advice, 16% were difficult to understand or misspelled.

As for attitude towards the game, the ratio of positive, negative and neutral advice in the studied sample was 56:26:18. It should be reminded here that these actually denote instances where the advice implied an attitude. This is not necessarily the same as the intentions of the authors, e.g. for the following examples it is difficult to judge what their intention and attitude towards the game were: “*Now i say something wise!*”, “*i before e, except after c*”, “*Do not eat stones.*”, “*Fat people are always great couches.*” Despite this ambiguity of these particular cases, there is sufficient evidence to declare that about half of the players demonstrated that they have been motivated by the game.

When considering only the meaningful statements, about 13% clearly expressed negative attitude and 42% were actual lessons that had some real value. For the purposes of further analysis, we consider only those advice where authors actually contributed (i.e. meaningful and non-negative, not excluding misspelled). Out of all analysed advice these were 221 (or 55%). This number is lower than advice coded as information sharing, because the latter included also, for example, some people sharing information, despite their expressed disliking of the game idea. Such advice will be referred to as actual advice further in the text.

Of these actual advice 28% were considered to be inspired by the game world, 21% - by the wisdom-of-the-giants topic and 15% by the worked example given in the game.

Related to the last of the above groups, there were several cases of mimicking of both the worked example advice (salt and vinegar theme) and the game theme (not big but wise), reiterated numerous times by non-payer characters. In the subsequently conducted interviews, there were two participants that disclosed to us that they also had the intention to mimic the example, had they managed to remember it. In both cases, participants shared with us that they wanted to continue the game in order to see what happens next, so they ended up writing nonsense. They revealed that in one case this was due to inability to come up with a more meaningful advice at that specific moment, whereas in the other the participant didn't understand that she was actually supposed to write her own advice. It's worth mentioning that the latter was not a fluent English speaker and might not have understood some of the in-game guiding.

Around 65% of the thus considered advice were related to a broader context, than just the game. Half of the actual advice were considered to be philosophical. Most (7 out of 10) interview participants gave advice of this kind. In 35% people actually gave advice with practical aspect or implications, as in the in-game example.

There were few cases where respondents expressed opinion about the game, instead of giving advice as instructed. Possible speculations for reasons could be meta-gaming or failure to immerse. In a related case one player actually left his e-mail for correspondence.

Around 25% of meaningful, positive, practical and lesson (20%) were soft-skill advice. Because these were gathered in informal settings with indications for philosophical thinking, they should be interpreted with some corresponding considerations, e.g. abstract topics with less pragmatic value are frequent, such as love, appreciation of the moment, etc. Here are some examples:

- “*No matter how hard things may be, look to the sky every morning and smile into the beginning of a new day.*”

- “*A man chooses, a slave obeys.*”
- “*Always learn to love your neighbour.*”
- “*Everyone dies alone its making sure you dont live that way that maters*”

For a portion of the reflections, attributed to actual contributors, we acknowledged that although they refer to the game, they might possibly carry a deeper philosophical meaning. We weren't able to conduct an interview with someone, leaving such advice, so in our lack of information, we assumed that the authors didn't intend the deeper implications that we saw. Some example advice in this context are “*whoever came before me was an idiot. all they did was create a huge blockage that no one will be able to overcome ever in the history of WTG.*” and “*Please tell me how to jump*”.

Although even more rare, there were advice that didn't refer the game directly, but could be interpreted in its context. Again, because of lack of supporting evidence from interviews, we assumed that this was unintended. Two examples follow: “*Those who have never failed, have never tried anything new.*” and “*do what you want*”.

There were instances of indexicality, where wording in second person is employed as a way to emphasize involvement. Several examples are “*If you promise yourself to study harder, keep your word. The one person you do not want to be disappointed in is you.*”, “*Continue with smoking and you will see the gods before you know it.*”, “*Tomorrow shall be a good day for you*”. Notice again, that as with soft-skills and hard truth, the specific wording was crucial for this coding.

Many occurrences of single words (e.g. *taller*; *quit*) were also considered indexical, as they acquire a deeper meaning only if considered together with the context that prompted them. As their contributors inevitably had the game in their focal awareness, we were confident about the accuracy of coding in these cases.

There were cases of text-art, smileys, etc. One of the interviewed participants contributed with a smiley. He explained that with appreciation of the game idea, but didn't find any actual reason to personally share an advice.

Out of all advice that referred the game, close to 80% were also indexical. Many of these were actual evidence of immersed utterances, such as identification with the game character, e.g. “*Jump on my head!*”, “**stabs self* blargg*”, “*There is no greater good, but there is no way forward, so ending it here is the only option...*”.

The interviews sample consisted of 7 male and 3 female participants with age average of 24 and standard deviation of around 4.5. When asked, half of the participants explained that they are from a mixed cultural background, having migrated between different countries. Thus, despite the fact that we perceived cultural background as an important factor, we are reluctant to consider the collected data to be representative. Two of interview participants have already played the game independently prior to our introduction. For them, we decided to merge the experience and retention interviews.

Within the conducted interviews, a number of participants mentioned that they have had difficulties with the game interface. It has not been intuitive to them when should they use the keyboard or the mouse for navigation, as at points during play each of theses input devices was needed. Also, several of the participants reported that when they reached the final stage, they couldn't commit a sacrifice, because they were blocked by other players and as a consequence couldn't do anything. This is a very probable reason for many potential players to drop out before they leave an advice.

The retention-related questioning has revealed that participants did not remember any particular advice they have read, despite of a generally expressed interest in what they've found. This could be possibly attributed to the huge amount of diverse advice encountered in a short period, many of which without actual learning value. However, those of them that have provided a meaningful advice (8 of the 10) had remembered it, although not always being able to recall the exact formulation they have used.

Discussion

This game and investigation explore an idea to capture the potential of game-like environments to persuade and motivate people towards social learning.

Despite the apparent differences between *We the Giants* and *Twitter*, the fact that both relied on short messages and are used in an informal environment gave us some reason to compare the two and declare that *We the Giants* achieves a higher percentage of shared informative statements than *Twitter*— a result that is considerably better: 65% were coded as some form of information sharing, compared to 22% informative messages on *Twitter*. Even more importantly, a third of all advice were considered to be actual lessons that could be learned. As noted before in this paper, these numbers need to be considered with caution, because of the slight difference in coding criteria.

Based on the coding, it could be claimed with high degree of confidence that this particular type of game-based approach served as a motivational factor for about half of the respondents. These people could possibly be approached to adopt similar tools as part of their personal learning environment.

The relatively high portion of actual advice that related to the game world could arguably be attributed to the dominant role of visual perception in human cognition (Posner et al. 1976). Interestingly, in contrast to generally referred importance of examples in learning, contributions influenced by the example, as well as those that gave practical advice represented a small portion. We are inclined to explain that with the fact that – opposite to recommendations from literature (Atkinson et al. 2000) – the example giving practical advice was not integrated with other components in the game that suggested rather philosophically deep advice.

The high correlation between game references and indexicality among the advice that indicates immersion could be attributed to the fact that willingness to immerse has previously been identified a stronger mediator than any properties of the environment itself (Psootka & Davison 1993). This indicates that to such learners, games could be a very engaging element in a personal learning environment.

Having said that, there are a number of design decisions in the game that might be reconsidered to allow for better focus of shared advice. Apparently measures could be taken to reduce the confusion, caused by the current user interface. Another possible direction could be to attempt to better align game topic, world and examples.

There is also the open question of how to facilitate contributions by non-contributing participants like the ones that have written nonsense. One possible option is to provide a list of previous advice to vote for, so they do not feel pressured to come up with actual original content, but rather be able to contribute by providing feedback on existing advice. It is an open question whether such an approach wouldn't actually have the side effect of reducing the amount of original content being shared.

Also, it might be reconsidered how the collected content is being distributed on *Twitter*. The observed failure to retain could be attributed to the fact that the accumulated advice did not appear in the game itself, but only a link to the corresponding stream was provided at the end of the game. A possible result of that could be that engagement in the game did not transfer to engagement in learning.

As a conclusion it could be said that whereas the game demonstrates success in knowledge sharing, it does not provide sufficient support for transfer of the shared knowledge. However, the survey reconfirmed the efficiency of knowledge sharing as a learning technique for the contributor. The results demonstrate that while in its current implementation the game does not support knowledge transfer, it might have certain potential for it. Subsequent research could try to focus on those design features of the game that promote this potential.

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