Transformative experiences through game based activities: reducing anxieties about plagiarism prevention software in postgraduate research students.

Steve Bentley, School of Applied Sciences, University of Huddersfield, HD1 3DH

Abstract

This paper discusses an intervention designed to address reported anxieties of postgraduate research students who are now required to submit their theses for analysis by Turnitin. A training session was provided, in which practical information was disseminated and a card game based simulation allowed participants to experience key aspects of the decision making process their examiner will use to interpret the Turnitin report for their work. This allowed students to appreciate that their assessor will consider the report in considerable detail, applying their own academic judgement rather than relying on software to make a binary pass/fail decision.

Transformative experiences, or micro-transformations, are small scale changes in a learner's perception as a result of classroom interventions. (Pugh, 2004) This activity is designed to facilitate such a micro-transformation by prompting students to re-evaluate the validity of their pre-conceptions concerning Turnitin.

In voting episodes at the beginning and end of the session, most participants reported that their nervousness about submitting their work to Turnitin had reduced, suggesting that such a change in perspective has occurred.

Rationale

A new University policy required postgraduate research (PGR) students to submit their theses for analysis by Turnitin as part of a revised plagiarism prevention strategy. As Learning Technology Advisor, I frequently facilitate staff development workshops on using Turnitin, and have recently begun giving a presentation on Turnitin as part of the induction process for internal examiners of research degrees.

It seemed that much emphasis was being placed on supporting staff in this process, but the needs of the PGR students were not being addressed. This was reinforced by anecdotal comments from staff reporting that some PGR students had expressed concern about the introduction of Turnitin and the prospect of it discovering inadvertent referencing errors, which might lead to accusations of research misconduct and potentially serious consequences. Turnitin is a system which is frequently misunderstood. Bensal, Miraflores, and Tan (2013) correlate anxiety and confusion surrounding Turnitin with a lack of adequate training for staff and students.

My approach was to develop a training session to give PGR students an insight into how Turnitin really works, to try to trigger a Transformative Experience (Heddy & Pugh, 2015). The session uses a card game based simulation in order to provide participants with experience of the decision making processes that assessors go through when they interpret a Turnitin report, to demonstrate the level of human attention that each report requires. This may prompt a re-evaluation and a more informed opinion about Turnitin's role in the examination of their thesis. Simulation based games allow learners to experience interacting with a representation of an authentic context, and may be more effective than a passive, didactic demonstration.

In addressing the needs of PGR students, there is an additional complication because of their exposure to Turnitin at their previous institution, which may have used it differently or not at all, so I felt that the session needed to address the basic practicalities of submitting a thesis in the context of this institution, as well as setting expectations about access to reports on draft submissions, the chief aspect where there is likely to be a discrepancy between arrangements at different institutions, before going on to demystify the originality report.

Logistical considerations mean that a classroom session is the most practical format, and ethical considerations prevent demonstrating using genuine work. My intention is merely to give a flavour of how examiners will interact with students' work, through the simulation game, rather than for participants to learn how to interpret the report in detail, although any familiarity they gain will be useful if participants do have exposure to originality reports for their work.

Literature review

In developing an experimental approach for teaching this session, I began by considering the reasons for doing so rather than defaulting to the standard lecture format. Gibbs (1981) offers

a provocative commentary on a range of reasons why lectures can be less effective than other forms of learning, although it must be stressed that he refers specifically to lectures which are entirely didactic, which are, arguably, rarely experienced by the modern student. In particular he highlights issues of students' attention span, suggesting 25 minutes as the maximum time during which students' attention can reasonably be expected on one task. Gibbs also argues that students tend to be passive whilst consuming lectures, and so the format's usefulness is limited to simple knowledge transfer rather than getting students to think about the material which is being presented.

Attempting to encourage a change of attitude and opinion appears initially to fit well with Mezirow's Transformative Learning Theory, (Mezirow & Taylor, 2009) however the concept of a transformative experience (Heddy & Pugh, 2015; Pugh, 2004, 2011) seems to be a better fit for the ambitions of the interventions described in the present paper, translating transformative learning to a smaller scale and seeking to facilitate micro-transformations in learners' perspectives rather than fundamental changes of an individual's world view. Transformative experiences have three defining characteristics (Heddy & Pugh, 2015):

- *Expansion of perception*, where a student's views are modified due to what they learned
- *Experiential value*, concerned with students valuing what they were taught because of its ability to influence their everyday experience
- *Motivated use*, where a learner applies concepts from the classroom to their daily life

Pugh (2004) admits that classifying changes in perception as transformations is controversial, but draws upon Dewey (1958; cited in: Pugh, 2004) to support his view. Heddy and Pugh (2015) concede that not all students would be expected to have transformative experiences with every piece of content. Measuring and evidencing that a transformative experience has occurred presents considerable difficulty, and (Pugh, 2011) implies dissatisfaction with each of the proposed methods he reviews.

Rather than didactically telling learners why they should not be anxious about Turnitin, I sought to facilitate an experience which would provide sufficient information to allow them to draw an informed conclusion. The revised Bloom's Taxonomy (Krathwohl, 2002) places "create" at the top of the hierarchy of educational goals, emphasising the complexity of learning activities which promote students creating their own understanding. Knowledge creation is heavily associated with the tenets of constructivism. Whilst much of the early

literature on constructivism is concerned with the education of children, its concepts have been shown to be particularly beneficial in designing learning interactions for adult learners because of the previous experience they bring to learning (Huang, 2002; Spigner-Littles & Anderson, 1999).

Kriz (2003) explains how simulation games are generally designed to allow participants to experience the consequences of decision making, and describes two models. Free form games, where players have considerable latitude to explore the simulation model, and rigid rule games where a clear framework is presented. He also emphasises the importance of a debriefing phase to the simulation to allow participants to reflect and apply what they have experienced to real world scenarios. This reflects Kolb's Experiential Learning theory and the associated Learning Cycle model (Kolb, 1984, pp. 38, 42), a constructivist approach which proposes "transformation of experience" as the method by which learners create knowledge. Kolb emphasises opportunity to reflect after an experience as being a precursor to the learner making sense of what they have experienced and considering how it might be applied elsewhere.

Moseley (2010) describes his use of a card matching game as a way to quickly introduce a concept and stimulate discussion. He reflects on the acceptability of the term "game" for certain audiences, suggesting that it might be considered to be "frivolous and unprofessional", and proposes that the term "activity" may be better received. Spigner-Littles and Anderson (1999) offer a similar cautionary note that adult learners often come to education with specific expectations and requirements.

Andragogy has been developed as a model of adult learning. (Knowles, Holton, & Swanson, 2014, p. 6) Andragogy differs from pedagogy in its acknowledgement that adult learners are more autonomous than those in compulsory education, and have specific motivation for learning. Of relevance to the present paper are the principles that adult learning is motivated by a need to learn because of a particular situation, rather than a desire to learn about a broad subject, and the importance of learners' diverse prior experience to the learning process. (Knowles et al., 2014, p. 22) These principles have implications for both how the session is promoted to PGR students and for how it is facilitated.

Quinsee (2012) continues that theme, reflecting that learners are often "disappointed" by sessions in non-lecture formats. This may highlight a need to set clear expectations of the participants in my experimental session who, as postgraduate students in the sciences, may

come with the expectation of a lecture, as that is likely to be the most prevalent form of teaching they received as undergraduates.

Description and critical discussion

I advertised a one hour workshop to PGR students in the School of Applied Sciences via email. In the email, I gave an outline of the session and explained that I hoped to provide reassurance about any concerns the students may have. It was important to give enough information to attract participants who, as adult learners, need to understand what they will learn and how the learning will be facilitated, and be convinced of the importance of the session (Knowles et al., 2014, p. 169). I specifically used terms like "workshop" and "interactive session" to be clear that this would not be a passively consumed lecture, to address the issues raised by Knowles and colleagues and by Quinsee (2012).

Attendance at the workshop was voluntary. 26 students booked to attend, and 22 attended on the day, along with a member of support staff who expressed an interest. I also received enquiries about additional sessions from potential attendees who were unable to attend. This level of interest appears to validate the premise that PGR students have training requirements which have not been previously addressed.

I considered using a flipped classroom approach to cover the more theoretical aspects of the session, freeing up time in the session for more interactive activities. This approach was rejected because it seemed everything fitted into a one hour session, which I felt was the right length, to make attending seem worthwhile but not be too difficult to make time for. Using a more standard approach removed the risk of the workshop session being complicated by participants failing to engage with the material before attending.

5 minutes	Housekeeping, introductions, two initial voting questions
15 minutes	Presentation
10 minutes	Game section 1
5 minutes	Reveal solution to game section 1, time for reflection and discussion
10 minutes	Game section 2
5 minutes	Reveal solution to game section 2, reflection and discussion, questions
5 minutes	Brief plenary summarising key take away points. Voting questions for evaluation
55 minutes	

Table 1: Outline time plan for workshop

The first part of the session was a presentation designed to establish the context and introduce an outline of how Turnitin works and the practicalities of the submission arrangements. I used voting pads in the session, both to facilitate some rudimentary evaluation, and to make the presentation less passive. That students can't be expected to concentrate on the same task for more than 10-20 minutes has been reported in the literature for several decades. Older reviews such as Gibbs (1981) and more contemporary works reflect on the work of Bligh (1972; cited in: Biggs & Tang, 2011) who argues that changes of activity can reset the attention span. I punctuated the presentation with voting interactions to regain students' attention and to prompt discussion. I asked two questions to open the session, a simple question to familiarise participants with the technology, followed by a Likert scale question which was used as a rudimentary measure of the effectiveness of the session.

I also used the voting pads towards the end of the presentation when I presented two straightforward examples of simulated extracts from Turnitin reports and asked whether participants felt the work was acceptable or if it potentially exhibited evidence of plagiarism. For both questions, a large majority of participants were correct (86% and 95% respectively) so I felt confident that I could move on to the next portion of the session, which built upon the same concepts. Had large numbers of participants demonstrated a lack of understanding, I would have attempted to facilitate a short discussion about why those with the wrong answer had come to that incorrect conclusion, to address the underlying misconception.

The next portion of the session was an activity based on the Microcosm Game described by Moseley (2010), adapted to become a rigid-rule simulation (Kriz, 2003), although I took Moseley's suggestion and used the term "activity" rather than "game" to avoid the risk of it appearing frivolous. The simulation featured a card matching activity, which allowed participants to experience the decision making associated with interpreting a Turnitin report, in a way which was more focussed than asking them to review a whole report. Participants were sitting in groups of approximately five people, and each group was provided with an identical deck of ten cards similar to that shown in Figure 1. Each card features an extract from a Turnitin report, along with a letter printed on top of a star.

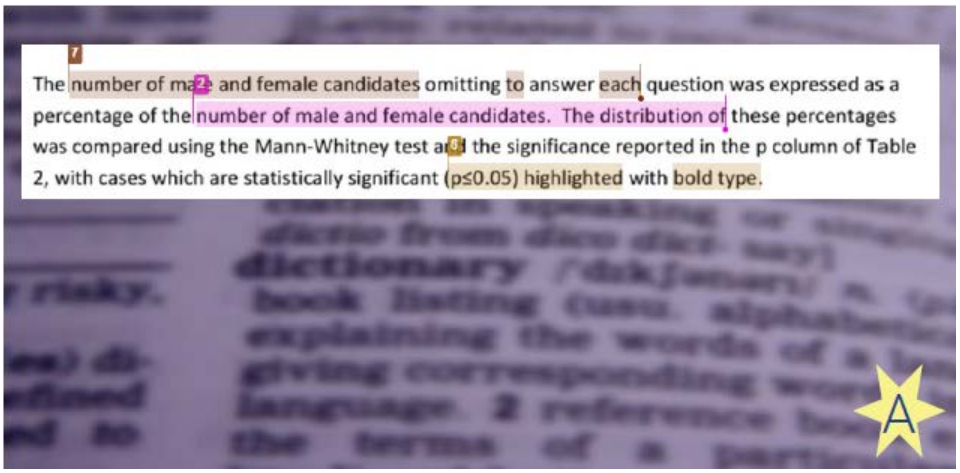

Figure 1: Example game card from the first deck

Participants were asked to categorise the cards based on whether or not they felt the report showed potential evidence of plagiarism. After they had completed this task, I revealed that the cards contained a key which would let them check their own answers. If the star symbol had an odd number of points, I felt the example showed potential plagiarism, whereas an even number of points indicated that I felt it was not plagiarised, although perhaps not recommended scholarly practice. I was careful to state that this was my interpretation, and some examples were borderline cases which I was happy to debate. This, and an emphasis on highlighting false positives in the examples, was a deliberate strategy in the design of the activity, to emphasise how Turnitin is used to inform an assessor's judgement on a students' work, rather than the software making a decision. Having participants check their own answers gave them a short opportunity to start to reflect, as advocated by Kolb (1984). Some groups had difficulty in understanding the concept of counting the points on the stars, so I will illustrate this using a slide in future sessions.

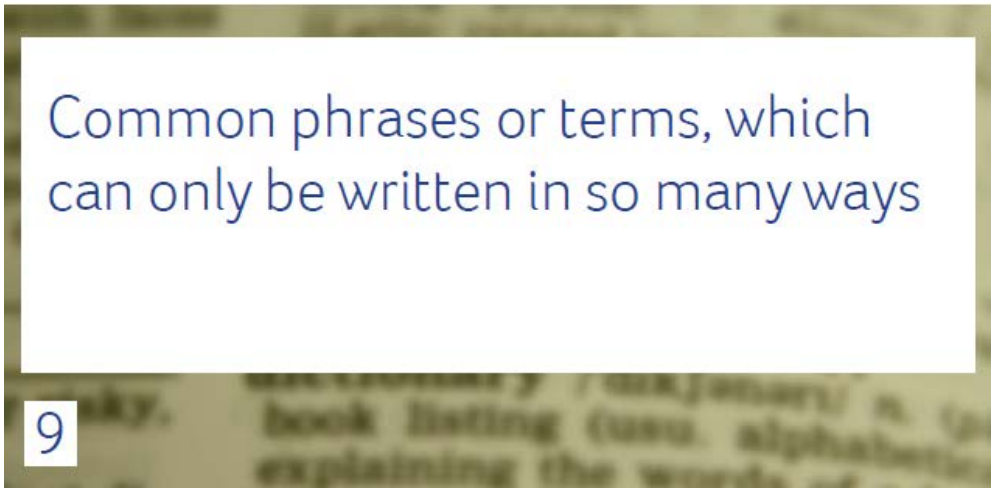

Figure 2: A card from the second deck

The second part of the activity introduced a second deck of ten cards as shown in Figure 2, each containing an interpretation of one of the Turnitin report extracts in the first deck and a number. A small prize was offered for the first group to match the two decks of cards, work out the code and stand up and tell me the number I was looking for. Properly matched and placed in numerical order, the letters on the first deck of cards would read “hours in day”, a clue to the number 24. A new rule was quickly introduced in response to speculative guessing from one team, requiring participants to explain the reason for their answer in order to claim the prize.

Despite some play testing with colleagues, I could not predict how long the game element would take with real participants. I had allocated up to ten minutes to play each part of the game (see Table 1), with a further five minutes for discussion and reflection, but some flexibility was possible. The workshop ran approximately to time, and I didn’t feel it was either too rushed or too drawn out. There was plenty of opportunity for questions and discussion, and I found the students were very willing to engage and ask questions, though this may be a function of a self-selecting group of participants and their motivation for attending.

I felt the game was very successful at prompting discussions between students, and I heard some very meaningful, on-task, conversations about the more borderline examples, to the extent that it took some effort to regain order when I needed to move the session on. For future occasions, I feel the groups would benefit from being managed, so that each table had a mix of students rather than groups of friends sitting together. International students chose to sit together, and I think, on reflection, there would have been benefits to the peer interaction to have had more varied groups because of the cultural differences in attitudes to plagiarism that have been observed (Amsberry, 2009). With randomly allocated groups, the mix of perspectives might have further enriched the discussions which the simulation provoked. Perhaps more trivially, there was arguably an unfairness because the competitive aspect of the game involved a word puzzle, which may have been more challenging for participants for whom English is a second language.

The rigid-rule nature of the simulation game scaffolded the learning by focussing attention only on the parts of a Turnitin report which I felt were required to gain sufficient insight to facilitate a transformative experience, whilst retaining some authenticity. Although having an understanding of how to interpret a Turnitin report can be useful for PGR students, the

intended learning outcome was to develop an appreciation that Turnitin can inform an academic judgement but it never makes a judgement, which I hoped would prompt a micro-transformation as learners re-evaluate the validity of their concerns about submitting their work. PGR students are constantly immersed in critical thinking and evaluation of evidence, so it seems logical to hypothesise that they might be receptive to a session in which they are presented with some information and given space to form their own opinion of it.

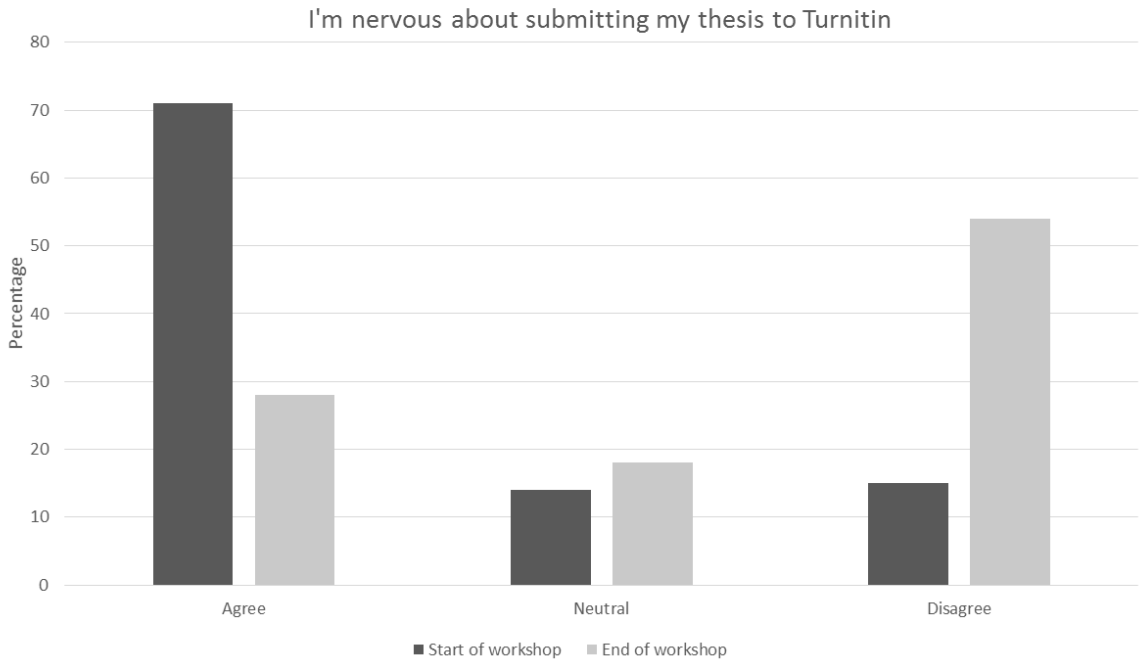

Figure 3: Summary of aggregated responses to evaluation question.

I used voting pads at the start and end of the session with the same question, "I'm nervous about submitting my thesis to Turnitin", using a seven point Likert scale (7=strongly agree, 1=strongly disagree). The results of the first vote were not shared with students until after the second vote to avoid influencing it. Comparing the responses on both occasions, summarised in Figure 3, demonstrates a clear shift in opinion between the beginning and end of the workshop.

A comparison of pairs of votes from both polls indicates a trend for students becoming less likely to agree that they are nervous by the end of the session. The modes of these data were 6 (agree) and 3 (somewhat disagree) at the start and end of the workshop respectively. A Wilcoxon signed rank test for related samples shows statistically significant differences

between the two sets of votes (p=0.003, n=19). This implies that a significant change in opinion has occurred between the start and end of this session.

An evaluation questionnaire, circulated by email after the workshop, elicited only n=4 respondents. Whilst this sample is unsatisfactory, it did highlight that none of those who responded were previously aware that they were permitted to submit drafts of their work, a fact which was covered during the presentation. It therefore seems possible that any reduction in anxiety may have been a result of taking the time to communicate the practicalities of submitting their theses and the policy relating to drafts, rather than necessarily as a result of the card activity. All agreed that "seeing how my examiner will use Turnitin gave me some reassurance" and strongly disagreed that "learning about Turnitin reports that I may never see was a waste of time". The low response rate means the questionnaire must be treated as indicative rather than statistically significant, but the feedback concurs with a further voting pad question at the end of the session, in which 95% of participants agreed that attending had been worthwhile.

Conclusion

This paper has reported an intervention using a card game based simulation to facilitate a transformative experience by prompting PGR students to reconsider their attitude towards plagiarism detection.

A transformative experience, or micro-transformation, is defined by three characteristics (Heddy & Pugh, 2015), which I posit that this intervention has facilitated or has the potential to facilitate.

- *Expansion of perception* demonstrated by a change in opinion about Turnitin because of what was learned.
- *Experiential value* is implied by the evaluation voting results.
- *Motivated use* is more difficult to immediately provide evidence for because of the narrow application of the concepts being learned. However it seems reasonable to expect that some students will apply what they learned to their writing, in considering how they use and attribute sources.

Almost every student who participated found the workshop beneficial, and a similar session will be offered to all PGR students next year.

Further work is required to examine whether merely communicating how the Turnitin process works is sufficient to trigger a micro-transformation and how significant the contribution of the simulation game was. The game has transferability to other contexts, including training staff to interpret Turnitin reports, and particularly with international students where it could stimulate discussion around cultural differences in attitudes to plagiarism, and help them to understand the requirements and expectations for their degree.

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