

Cognitive dissonance in student self-assessment

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Structured abstract

BACKGROUND

When students are required to assess their own work (e.g. assignment) against a set of criteria (i.e. expected answers and assessment guidelines) and provide written feedback, they often seem to find themselves in a situation of conflicting beliefs. The apparently perfect assignment that they submitted suddenly falls short of required standard and becomes imperfect. This sudden change in the quality of their work leads them to a state of cognitive dissonance or conflicting beliefs. Dissonance, being psychologically uncomfortable, motivates them to seek consonance through an attempt to remove or reduce the conflict (Festinger, 1957). During this process, students seem to vary substantially in their responses. This paper identifies strategies followed by self-assessing students in reaching consonance.

PURPOSE

The purpose of this paper is to provide an understanding of students' response patterns while seeking cognitive consonance. The research question is: How would self-assessing students, facing cognitive dissonance, return to a state of consistency or consonance?

APPROACH

The student self-assessment of assignment study was conducted in a first year course in 2010, 2011 and 2012. The assignment comprised of several questions requiring descriptive short answers. Students submitted their assignment electronically. The assignments were marked by the tutor and self-assessed by the students independently against a set of expected answers and assessment criteria. Self-assessing students provided written justifications for the marks they allocated to each question. Marks awarded and written justifications (provided by students) were analysed in terms of the accuracy of marks and the completeness and correctness of the answers provided. This combined qualitative and quantitative analysis was performed to identify students' response patterns with regards to the approaches they undertook to remove or reduce their cognitive dissonance. Typical response patterns were recognised through the identification and grouping of similar responses.

RESULTS

The general strategy followed by students in an attempt to remove or reduce cognitive dissonance (i.e. reaching consonance) seemed to fall into one of the following three broad categories:

1. Modify cognition to cope with new facts (i.e. change one or more of the beliefs, opinions, or behaviours involved in the dissonance) - "*An instance of acceptance*"
2. Integrate new facts to preserve an "own self" by reducing the importance of conflicting instance - "*An instance of avoidance or deviation*"
3. Forget, ignore, overlook, or bypass those cognitions that are in a dissonant relationship - "*An instance of ignorance*".

CONCLUSIONS

Cognitive dissonance theory is built on the notion that individuals strive towards consistency. It is generally agreed that people undertake one of the three strategies identified above to reach to consonance. Through this study, it is confirmed that students do generally fall into one of the above categories when they are exposed to cognitive dissonance during self-assessment. However, there seems to be no crisp boundary between these choices. How the behaviours, attitudes or beliefs demonstrated through this study translates to reality, remains to be seen.

KEYWORDS

Student self-assessment, cognitive dissonance, consonance

Introduction

Leon Festinger (1957) published the theory of cognitive dissonance that describes the concept of 'cognitive dissonance' as a psychological state in which an individual's cognitions are at odds. Festinger's theory postulates that individuals, when presented with evidence contrary to their worldview, experience cognitive dissonance. Kowol (n.d) identified cognitive dissonance as pressure of an aversive motivational state. Two beliefs (or attitudes, perception, behaviours, opinions, knowledge, understanding or worldviews) become dissonant when they conflict or become inconsistent with one another. Chabrak & Craig (2011) quoted cognitive dissonance as a "state of unpleasant internal tension due to the simultaneous presence of two cognitions that are psychologically inconsistent and discordant with each other". It is generally agreed that cognitive dissonance is a feeling of discomfort due to holding conflicting opinions, beliefs, attitudes, behaviours, knowledge and/or understandings. Cognitive dissonance begins when people commit a behaviour and then assess the behaviour against some meaningful criteria judgement (Stone & Cooper, 2000). Cognitive dissonance can occur in many areas of life and it is particularly evident during self-assessment. Cognitive dissonance can lead to some level of disharmony in the human mind.

Self-assessment

Self-assessment is a process of formative assessment by which people reflect on their own performance against a set of norms, criteria and/or behaviours. It is a mechanism for revealing one's strengths and weaknesses (Eva & Regher, 2005). Such revelation can, however, lead to a situation of discomfort due to disharmony (or dissonance) in the self-assessor's pre-existing cognitions. For example, when students are required to self-assess their own work (e.g. assignment) against a set of criteria (e.g. expected answers and assessment guidelines) and provide feedback, they potentially find themselves in a state of conflicting beliefs. The apparently perfect assignment submitted earlier, may suddenly fall short of the required standard, and hence, become imperfect. This consequence could be a result of the inception of cognitive dissonance. The theory of cognitive dissonance explains how individuals deal with such dissonance. The theory suggests that the existence of dissonance will motivate the person to try to reduce the dissonance and achieve consonance (Festinger, 1957). Hence, the theory of cognitive dissonance is built upon the notion that individuals strive towards consistency (Metin & Camgoz, 2011).

The nature of dissonance

In cognitive dissonance theory, Festinger conceptualised two aspects of dissonance; (a) dissonance as psychological discomfort, and (b) dissonance as a bodily condition similar to tension (Elliot & Devine, 1994). Dissonance, as psychological discomfort, was explicitly identified as motivational component in the classic cognitive dissonance theory (Festinger, 1957). However, the most recent research on the nature of dissonance have focused on Brehm and Cohen's derived arousal component of dissonance (Elliot & Devine, 1994) and the role of self-consistency in dissonance arousal and subsequent reduction processes (Stone & Cooper, 2000).

The magnitude of dissonance

The level of dissonance depends on the importance placed on the element (i.e. opinion, belief, perception, behaviour, attitude, knowledge etc.) that is dissonant. If a person places higher importance on a conflicting element, the magnitude of the dissonance will be greater (Festinger, 1957). As the magnitude of dissonance increases, pressures to avoid the situation increase (Festinger, 1957). So, the level of dissonance and the amount of effort expended to reduce the dissonance (i.e. to reach to consonance) vary depending on the level of emphasis placed on the element by the individual. In student self-assessment, a high achieving student would potentially experience a higher magnitude of dissonance resulting in higher effort to reduce it, and therefore achieve a better learning outcome.

Reaching consonance

Cognitive dissonance theory is based on the assumption that individuals strive towards consistency to reduce the psychological discomfort arising from inconsistencies (Festinger, 1957). The theory utilizes the terms “dissonance” and “consonance” to describe cognitive inconsistency and consistency respectively. In this regard, Festinger (1957) suggested that individuals might change behavioural cognitive elements, environmental cognitive elements, and/or add new cognitive elements to reduce dissonance. Over the years, several studies have focused on dissonance reduction strategies (e.g. Kowol, n.d.; Elliot & Devine, 1994; Chabrak & Craig, 2011). From the results of these studies it is clear that individuals experiencing cognitive dissonance can respond in several ways. Most of the responses seem to fall into three distinct categories. A person in a state of cognitive dissonance can:

1. *Modify cognition to cope with new facts (i.e. change one or more of the beliefs, opinions, or behaviours involved in the dissonance) - 'an instance of acceptance'*
2. *Integrate new facts to preserve an “own self” by reducing the importance of the conflicting instance - 'an instance of avoidance or deviation'*
3. *Forget, ignore, overlook or bypass those cognitions that are in a dissonant relationship - 'an instance of ignorance'.*

Research question

According to Festinger's cognitive dissonance theory, dissonance produces discomfort and, correspondingly, there will arise pressures to reduce or eliminate the dissonance. So, in the event of dissonance, individuals will be motivated to reduce the dissonance and avoid situations that increase it (Metin & Camgoz, 2011). Hence, individuals experiencing dissonance will try to restore coherence using various strategies. Similar strategies (approaches) should be adopted by the students' experiencing cognitive dissonance from the self-assessment of assignment. Therefore, the research question for this study is:

How would self-assessing students, facing cognitive dissonance, return to a state of consistency or consonance?

Procedure

The self-assessment of an assignment study was conducted in a first year Geographic Information Systems (GIS) course in 2010, 2011 and 2012. The class size ranged between 130 to 215 students. More than 75% students were enrolled in the course externally. At the beginning of the semester, students were given an assignment comprising of 8-10 short answer type composite questions. Assignment preparation guidelines and a marking rubric were provided with the assignment questions.

Students completed and submitted the assignment digitally via an electronic assignment submission “Dropbox” provided within the university Learning Management System. Students were asked to self-assess their (submitted) assignment using model answers, self-assessment guidelines, and self-assessment feedback rubric provided. They were also required to allocate marks and to provide justifications for the marks for each answer on the self-assessment feedback rubric which they submitted for assessment.

Assignment submission by the students, assessment of assignments by the tutor, students' self-assessment, assessment of students' self-assessment, and the release of marks were performed as shown in the flow chart diagram (Figure 1) below. It is to be noted that students' self-assessment marks were not counted towards their summative assessment to avoid possible “marks sharks” behaviour as described by Ross (2006). Instead, the quality of students' self-assessment feedback was assessed separately by the tutor.

There were 136, 152 and 211 students' self-assessments submitted respectively in years 2010, 2011 and 2012. Twenty percent of these submissions (i.e. 27 in 2010, 31 in 2011, and 42 in 2012) were sampled randomly for this study. Altogether 100 samples were included in this study. Each of the 100 samples was analysed separately to identify students' responses to cognitive dissonance (or to understand their action to reach to consistency or consonance). The analyses involved both quantitative and qualitative processes.

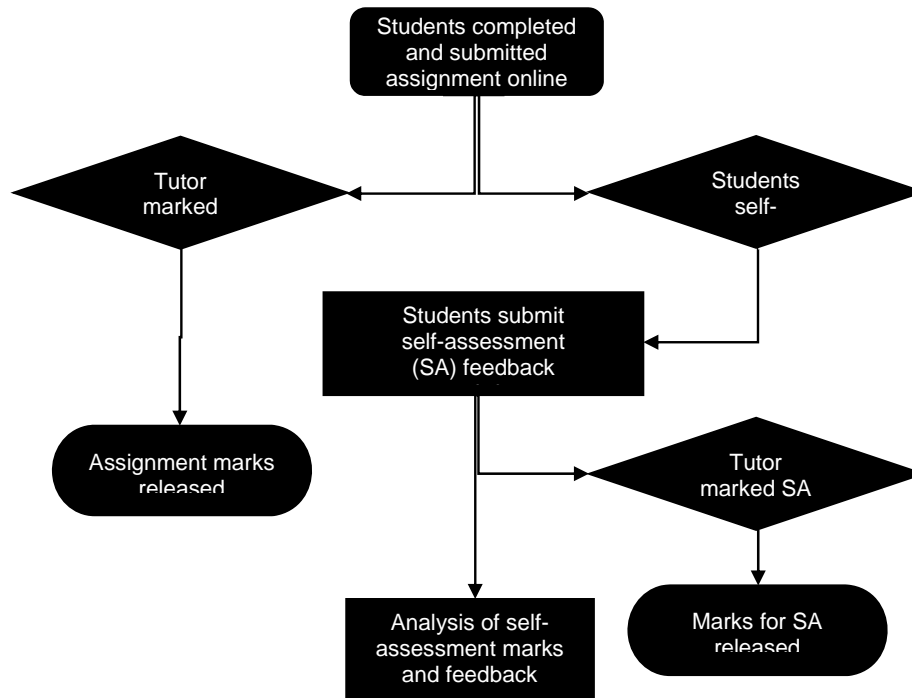


Figure 1: Assessment, self-assessment and analysis process
(Source: Basnet et al. 2012)

First, students' self-assessment marks were tallied against the Tutor's assessment marks to determine the accuracy of students' self-assessment. In this instance, the Tutor's assessment marks were taken as the "gold standard" or expert judgement (Ward et al., 2002). Second, written justifications provided by students (i.e. claims made by students for self-assessment marks) were assessed in view of the accuracy of their self-assessment to determine the approaches they undertook to respond to cognitive dissonance. For example; if a very high achieving student claimed his/her answer to be 'perfect', it is very different as compared to the similar claim made by a low achieving student. In this case, the two students may have similar claims but vastly different dissonance management strategies. Therefore, samples were carefully analysed using both the above described processes and grouped them into one of the following three response categories. These response categories are formulated in-line with the dissonance management strategies described in the cognitive dissonance literature (e.g. Kowol, n.d.; Elliot & Devine, 1994; Chabrak & Craig, 2011).

Category I: Unconditional acceptance of new facts

Accurate to moderately accurate self-assessment marks, clear admissions of deficiencies in the assignment, clear expression of willingness to change (i.e. ready to modify cognition to cope with new facts).

Category II: Deviated acceptance of new facts by preserving "own self"

Accurate to moderately accurate self-assessment marks, evidence of deviated justifications (emphasis on something else), some acceptance of deficiencies, limited instances of willingness to change (i.e. integrate new facts to preserve "own self" using an "avoiding process").

Category III: Straight ignorance or rejection of the new facts

Moderate to grossly overestimated self-assessment marks, no admission of deficiencies (realities), irrelevant justification if any, baseless haughty statements (i.e. poor performance

in assignment and yet claimed as excellent or perfect answer). A clear case of ignorance of the importance of those cognitions that were in a dissonant relationship.

Results & Discussions

Students' self-assessment accuracy

Students' self-assessment accuracy varied from very accurate (i.e. within $\pm 1\%$) to very inaccurate (i.e. within $\pm 63\%$). In Table 1 below, the three self-assessment accuracy levels (i.e. within $\pm 10\%$, within $\pm 11-30\%$, & more than $\pm 30\%$) have been selected respectively for accurate, moderately accurate, and inaccurate (or overestimated) classification. These levels were determined based on actual variations found in the students self-assessment marks.

Table 1: Accuracy of students' self-assessment

| Semester/ Year | Total no. of self- assessment participants | Randomly drawn (20%) sample | Number of assessments falling within $\pm 10\%$ marks | Number of assessments between ± 11 -30% marks | Number of assessments falling above $\pm 30\%$ marks |
|-------------------|---|--------------------------------------|--|--|---|
| Sem. 1, 2012 | 211 | 42 | 19 | 16 | 7 |
| Sem. 1, 2011 | 152 | 31 | 12 | 15 | 4 |
| Sem. 2, 2010 | 136 | 27 | 16 | 7 | 4 |
| Total | 499 | 100 | 47 | 38 | 15 |

Note: Tutor's assessment was considered as 'gold standard' (Ward et al., 2002) in this comparison.

The result showed that 47% of the students accurately self-assessed to within $\pm 10\%$ of the Tutor's mark. It should be noted that not every student falling into this category was high achieving student.

About 38% students (Table 1 above) were able to self-assess their work within $\pm 30\%$ accuracy. These ranges are not surprising given the subjective nature of the assessment task involved, where experienced markers also vary substantially in their assessments.

A sizeable proportion of students' self-assessments (i.e. 15%) were well outside the range. Most of these students overestimated their self-assessment marks. This is, however, not uncommon as it aligns with the findings of Boud & Falchikov (1989) and Ross (2006).

The overestimation by self-assessing students could be attributed to one of the following reasons. Some of these students could have completed the self-assessment task without taking into account the answer guide and the self-assessment guidelines provided. Some other students may have intentionally ignored those cognitions that are in a dissonant relationship. They may have done so because of their high self-efficacy beliefs leading to high expectations (McMillan & Hearn, 2008). This study was not intended to find out the reasons for such overestimation of marks by students. However, future studies may require exploration of these aspects at greater depth.

In this instance, gaining insight into the accuracy of students' self-assessment marks was critical to developing appropriate learning & teaching strategies.

Students' responses to dissonance

The cognitive dissonance theory (Festinger, 1957) suggests various levels of effort (or striving) by individuals to remove dissonance (or to reach to consonance or consistencies). This study looked closely into this dissonance-consonance relationship for self-assessing students. The response patterns of the sampled 100 students were examined both in terms quantity (i.e. accuracy of self-assessment marks) and quality (i.e. written justifications provided in defence of self-assessment marks), and then grouped into one of the three

response categories identified earlier. Table 2 (below) summarises the samples falling into various categories.

Table 2: Students' response patterns in an attempt to remove dissonance

| Semester/ Year | Total no. of self- assessment participants | Randomly drawn (20%) sample | Category I No. of clear cases of acceptances | Category II No. of cases of deviated acceptances | Category III No. of clear cases of ignorance |
|-------------------|---|--------------------------------------|---|---|---|
| Sem. 1, 2012 | 211 | 42 | 11(2) | 20 (2+3) | 6(3) |
| Sem. 1, 2011 | 152 | 31 | 8 | 16(2) | 5 (2) |
| Sem. 2, 2010 | 136 | 27 | 5 (3) | 11(3+3) | 5(3) |
| Total | 499 | 100 | 24 (5) | 47 (13) | 16 (8) |

Note: Number within brackets refer to boundary cases between categories.

Category I students were able to clearly acknowledge the strengths and the weaknesses of their answers. In some cases, they suggested measures for future improvements. It is noted that a small proportion (less than 20%) of these students slightly underestimated their marks during the self-assessment. Some examples of comments provided by these self-assessing students are given below:

- *"Most answers were provided at the most basic level. A lot more detail could have been provide, and much better paragraph structure was required. Much better proof reading is needed in future".*
- *"A fault which I made throughout the assignment was that I went into far too much detail and sometimes went off the topic. Some answers were made clear and direct, whereas others were 'messy' and not setout as they should have been".*
- *" Poor use of planning time to spend on each question. Spent too much time on questions that were not worth much marks and vice versa".*
- *"Suggest that the student consider the question carefully e.g. 'discuss', 'compare' and also consider the marking rubric e.g. illustration".*
- *"I missed main points that need further reference. Spelling mistakes. More diagrams would have helped. Excluding a answer and briefly describing others was also a drawback. Lesson learned - will do better next time".*

Category II students appeared to be keen to prove the correctness of their work before accepting the new information. The preserving "own self" attitude was clearly visible. Some comments provided by these self-assessing students are presented below:

- *"Overall answers were very descriptive and articulate, however some questions are missing answers. Good work Overall".*
- *"Good effort overall. Could be more concise at times and have chosen alternative layout for some questions".*
- *"Overall a very complete response with correctly achieved answers. With the use of examples, diagrams and definitions. references on all questions may have gained fuller marks but a fine result no doubt".*
- *"I am very happy with the way the assignment has come together, however, I may have been able to use more tables, to better explain my answers, when comparing data. Some answers required further explanation and I will learn from this as a result".*

Category III students were clearly reluctant to make reference to the answer guide and provided self-assessment details. The justifications provided by these students were usually brief, lacking evidence and haughty. In most cases they substantially overestimated their

assignment marks. Most of these students were not high achievers. Some comments provided by these students are presented below:

- *"The assignment in total is the correct length for the amount of marks on offer".*
- *"Generally very well written explanations. Well laid out answers".*
- *"Assignment has been written and structured according to the original marking rubric for very easy translation of answers into mark".*
- *"A few references here and there missed but overall a very descriptive, detailed assignment that provided comprehensive and accurate answers".*
- *"Excellent answer covering all the information. References listed at the end. Great image correctly referenced".*

As indicated by a number of border-line cases in Table 2, it has not always been easy to clearly classify self-assessments into one category or another. However, a trend becomes more obvious once the marks received by students for the assignment are compared against with self-assessment marks and justifications.

This has been a fruitful exercise in terms of identifying unique cognitive dissonance management strategies followed by students during the self-assessment. Clearly, Category I students have demonstrated their willingness to modify cognition to cope with new facts. They demonstrated readiness to change one or more of their beliefs, opinions, or behaviours involved in the dissonance. This is a clear case of acceptance. It could be seen that this category of students benefit most from the self-assessment task and feedback provided by tutors to their assignment. However, this proposition needs to be investigated.

The Category II students were more inclined to defend their work before accepting the change. Their attempts to try to reduce the importance of conflicting instance were clearly visible in the comments. This has been an instance of avoidance or deviation. This category of students could possibly take time to absorb the contents. But, they could still benefit from the self-assessment task and feedback provided by the tutors. However, this proposition needs to be validated.

The Category III students were almost invariably ignoring those cognitions that were in a dissonant relationship. It appeared that they did not want to accept the right answers. They often emphasized irrelevant facts and overlooked the more important facts. This has been a clear instance of ignorance. This category of students may have some other reasons for demonstrating such behaviour. Their learning motivation could be an issue. Hence, further work is required to understand the reasons behind their behaviour.

Identification of these response categories has been valuable in understanding dissonance management strategies adopted by self-assessing students. However, it is unknown how these experiences will be utilized by students in terms of learning. For example, a Category I student may accept the weaknesses in their work easily for now but there is no guarantee that these students will learn the lesson and perform better in the future. Similarly, a Category III student may claim that their work was excellent even if it was not, but, will they be satisfied with such response? They could potentially learn from it and perform better in the future. So, there is a need to follow-up this study to understand the practical implications of dissonance management strategies undertaken by self-assessing students.

Conclusions

Cognitive dissonance theory suggests that when people experience dissonance, they strive to reduce it (or try to reach to consonance) using one of the three unique strategies. They may: (a) modify cognition to cope with the new facts, (b) integrate new facts after highlighting their own importance, or (c) ignore or bypass the importance of cognitions that are in a dissonant relationship. In this study, students' self-assessment of an assignment was used as an experiment to test these attitudes (or behaviours). The study confirms that students do

generally fall into one of the above three categories when they are exposed to cognitive dissonance through self-assessment. However, clear categorisation of self-assessing students is not necessarily easy. It remains to be seen how the demonstrated behaviours, attitudes or beliefs translate into reality.

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