

Where is the Feedback! A Decomposition of Feedback Mechanisms in an Introductory Information Systems Course

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Abstract

While the importance of feedback to learning is well acknowledged in the pedagogical literature, the perceptions of multiple forms of feedback among learners is yet to attract significant attention, particularly in the IS context. Consequently, this research investigates the antecedent constituents of feedback and how they contribute to an overall perception of feedback in an introductory IS course. Building upon such investigation, the study explores how such an overall perception of feedback contributes to a favourable experience in a course. To such end, a research model grounded in the pedagogical literature was operationalised and quantitative empirical data collected and analysed using PLS. The results indicate that summative and generic assessment feedback were found to be significant towards formulating an overall perception of feedback, and that such perception is significant in influencing a learner's experience in a course. The findings hold important implications to theory and practice, particularly for IS education.

Keywords

Feedback, IS Education, First Year Experience, Learners' perceptions of Feedback, PLS

Introduction

Access to feedback is well acknowledged in the pedagogical literature as a cornerstone of effective learning and teaching (Hattie, Biggs, and Purdie 1996; Sadler 1998; Black and William 1998). This introduces pertinent and persisting challenges to curricular designers and instructors to provide students with timely and diverse opportunities to attain feedback that would facilitate and deepen learning processes. Consequently, feedback mechanisms have attracted significant research interest, spanning from studies on the design and provision of summative and formative feedback (Harlen and James 1997), to peer

assessment and feedback (Boud, Cohen and Sampson 1999), and to forward and upward feedback mechanisms (Hounsell, McCune, Hounsell and Litjens 2008), to name a few. However, while such studies have proven invaluable in presenting and recommending effective practice for curricular designers and instructors to adopt, several deficiencies still persist, at the forefront of which is the perception of effective feedback by the learners. Prescribing effective practice for feedback in teaching delivery is therefore best complemented with an understanding of how such feedback mechanisms are perceived by the learners, in order to achieve a comprehensive view of effective teaching and learning. The literature deficiency in the latter is the subject of this study.

This study is empirically contextualized in a first year Introduction to Information Systems course at a large Australian university (it is noted that the terms 'subject' or 'unit' are often used in the Australian context to describe an academic topic of study that a student usually undertakes over the period of a semester as part of their degree, however, while these terms are used interchangeably, the term 'course' is used here to accommodate a broader international readership). The study was partially motivated by the fact that, although a myriad of feedback mechanisms were incorporated in the course (including in-class feedback in lectures and tutorials, peer assessment and feedback tasks, and feedback on individual and group assessment activities) university administered student evaluation forms only incorporated a single question on feedback, which inquires about whether a student found the feedback to be effective. Unfortunately, this did not provide for a clear understanding of which feedback mechanisms, including formative, summative, individual and generic mechanisms, were viewed as important and relevant from the students' perspective. This motivated an investigation of the extant literature which led to the identification of the literature gap, and influenced the initiation of the study. Consequently, we aimed to respond to the following research questions: What feedback mechanisms are perceived as important by students in an introductory IS course? and; does an overall perception of positive feedback contribute to a favourable experience in such course?

In addressing such questions, the paper commences by providing a brief overview of the literature followed by the development of relevant hypotheses; the research methodology is then presented along with the empirical results; this is followed by the discussion, implications, and conclusion sections.

Literature Review

In traversing the literature, it is vital to recognise the different definitions and conceptualisations of feedback. Hattie and Timperley (2007, p.81) conceptualise feedback as '*information provided by an agent (e.g., teacher, peer, book, parent, self, experience) regarding aspects of one's performance or understanding*'. They view feedback as a resulting consequence of performance relating to one's assessed skill, abilities or understanding (Hattie and Timperley 2007). Furthermore, in educational contexts feedback is generally recognised as a crucial means by which to improve knowledge, build on student skills (e.g., Azevedo and Bernard 1995; Epstein, Lazarus, Calvano, Matthews, Hendel, Epstein and Broswic 2002; Moreno 2004; Pridemore and Klein 1995) and facilitate independent life-long learning that continues into professional practice beyond formal educational settings (Ferguson 2011; Hounsell 2003).

For others, feedback is seen as a central part of learning (Cramp 2011) and conceptualised as a supported sequential process rather than a series of isolated events (Archer 2010). In contrast, the idea of feedback as part of a continuous process to support learning that progresses into professional practice beyond higher education can also be identified by the terms feed-forward and feed-up, respectively (Hounsell et al 2008). Consequently, many studies have shown feedback to be an essential part of learning, as it specifically relates on performance and thereby enables improvement and higher-order learning (Sadler 1998). It has been shown that feedback is one of the most effective means of promoting transformative learning (Harvey and Knight 1996), and that students themselves value quality feedback (Horsburgh 1999; Hyland 2000; O'Donovan, Price, and Rust 2004).

From the literature reviewed, there is an overall implicit dominant notion that the provision of feedback will necessarily lead to improvements in subsequent pieces of work. High quality feedback is positioned as the overriding influence on student achievement (Brown and Knight 1994; Hattie 1987). In pedagogical circles, these assumptions are proposed as 'uncontestable truths' and 'common sense'. A study by Crisp (2007), for example draws on her experiences to comment that often, should students fail to perform

adequately, it is often assumed that the teacher might have failed to provide adequate feedback. However, despite the noble intentions of educators in providing adequate feedback, there is also the issue of whether students are able to recognise, grasp and interpret the types of feedback provided in a meaningful manner that meets their expectations. Recent research has emphasised that it is also about how students make sense of the importance of the feedback received (Higgins, Hartley and Skelton 2001; Orsmond, Merry and Reiling 2002) and whether or not they actively engage with the feedback (Orsmond, Merry and Callaghan 2004). Other factors affecting the ability of students to respond to the feedback include the tone of feedback (Read, Francis and Robson 2005) and receiving too much feedback, which leaves them feeling overwhelmed (Brockbank and McGill 1998).

Yet, a distinction needs to be made to clarify what constitutes feedback in the gamut of instruction and feedback as highlighted by Hattie and Timperley (2007). In their opinions, feedback happens as a second part of the teaching process – after a student has responded to instruction. It is a consequence of students' performance, in order to construct and relate new information to what is already known. The writers quote Winne and Butler (1994, p. 5740) to surmise that *"feedback is information with which a learner can confirm, add to, overwrite, tune, or restructure information in memory, whether that information is domain knowledge, meta-cognitive knowledge, beliefs about self and tasks, or cognitive tactics and strategies"*. Adding on to the work of Ramaprasad (1983) and Sadler (1989), feedback is seen to bridge the gap between actual performance levels and the anticipated learning goals (Lizzio and Wilson 2008). In essence, feedback is acknowledged widely in the literature as critical in the development of effective learning (Black and Wiliam 1998; Hattie et al. 1996; Hattie and Jaeger 1998). Feedback can thus be defined as information conveyed to the learner with the intention of modifying his or her thinking or behavior to improve learning (Shute 2008, p.154) with the addendum that it needs to be delivered correctly.

Significantly, for some, it is only feedback if it alters the gap and has an impact on learning (Draper 2009; Wiliam 2011). What is missing in the literature is feedback mechanisms provided in various learning settings and whether this impacts student perceptions of feedback and hence their overall experiences in a course. Feedback is a particularly important focus for our study because the effective and regular delivery of feedback remains a fundamental mechanism for making new university students feel supported, accustomed to and comfortable within the university environment (Long, Ferrier and Heagney 2006).

Research Model and Hypotheses Development

Our paper situates the research on student feedback perceptions within a model of first year learning experiences. A research model proposed by this study is presented in Figure 1. The model comprising of 5 elements of feedback (H1-H5) in an IS course which are investigated to measure their impact on student's overall perception of feedback, and as a result, their overall perception of learning experience with the course (H6). Overall, we posit that a favourable perception of feedback received will lead to a positive overall experience in a first year IS course. These hypotheses are explained in further detail in the next sections.

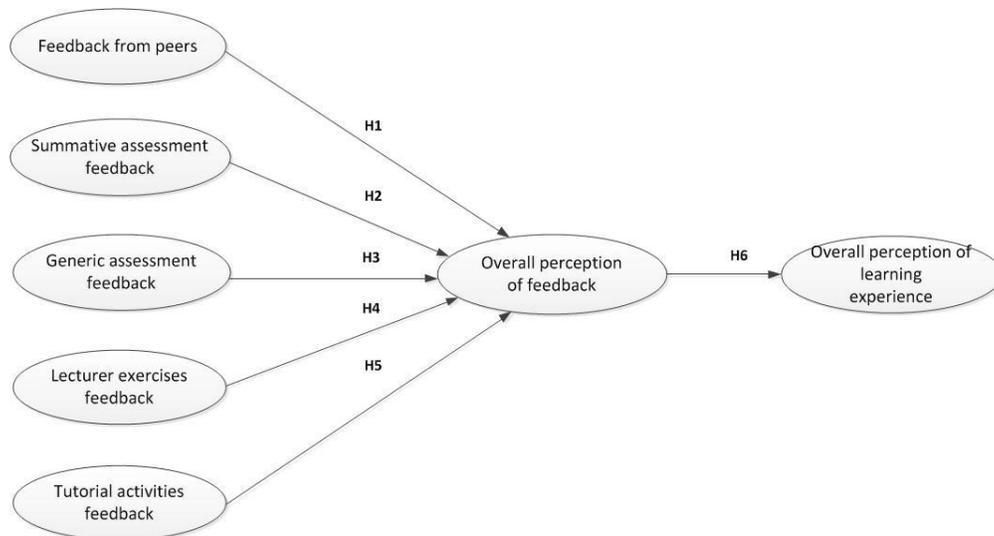


Figure 1: Research Model

Feedback from Peers

There is a large body of complementary research studies demonstrating the effects of self and peer feedback on learning (e.g. Boud 1995; Boud, Cohen and Sampson 1999). Peer feedback is said to promote student-centered learning, encourage students to produce their work for a larger audience, and may reduce teacher workload by reducing personalised feedback to every student (DiPardo and Freedman 1988). Vygotsky (1978) argues that interactions with more able peers can help students reach their full potential through what he called students' "zone of proximal development." He states that through peer collaboration, students' developmental levels are likely to progress. Some suggest that the introduction of some element of peer assessment may help students to become more familiar with the meanings of the criteria upon which their work is evaluated (Higgins, Hartley and Skelton 2002). They can then accurately estimate their academic work, assess their progress, and adjust their learning strategies accordingly.

Within higher education, a recently new practice of feedback has been identified evidenced by peer assessments utilised to promote student self-regulatory practice (Cartney 2010; Nicol 2010; Rust 2007). It is said that involving pupils in their own assessment means that they are expected to know the aims of their learning. Pupils are said to be able to develop understanding of learning objectives and achievement criteria through experiences designed to involve them in looking critically at their own work (Harlen and James 1997). Therefore, a hypothesis applied in this study is that peer feedback has a positive impact on the students' overall perception of feedback.

H1: Feedback from peers is likely to lead to an overall positive perception of feedback in an IS course.

Summative Assessment Feedback

Summative assessment is viewed as having a quite different purpose compared to formative feedback (Harlen and James 1997). It describes the learning achieved by students at a certain time 'for the purposes of reporting to parents, other teachers, the pupils themselves and, in summary form, to other interested parties such as school governors or school boards' (p.370). It is perceived by educators to have important role in the overall educational progress of pupils but not in the everyday teaching compared with formative assessment. However, it has been suggested that an extensive proportion of students focus on the marks received, with the assessment comments being of only secondary concern. For such students, feedback may only be acted upon if there is a desire to acquire a better mark on a subsequent occasion (Smith and Gorard 2005). Our hypothesis tested in this matter is that:

H2: Summative assessment feedback is likely to lead to an overall positive perception of feedback in an IS course.

Generic Assessment Feedback

Generic feedback is useful for teachers to modify instruction for the whole class and for students to see how they are generally progressing. Knight and Yorke (2003), that *'although many teachers give a lot of feedback on specifics, it is general feedback that has the greater power to stimulate learning'* (p. 33). Such feedback has the potential to 'feed-forward', into future tasks rather than back to completed assignments.

Others found that while the students desire feedback that provides them with a grade, they also seek feedback which focuses on generic, 'deep' skills (Higgins et al 2002, p.60). Additionally, optimal feedback for formative use may not necessarily be specific, detailed, positive, and individualized (Jonsson 2012), as is often assumed (Gibbs and Simpson 2004; Race 2007). Instead, less specific and individualised feedback, which forces the students to actively engage with the information, may actually be more productive for student learning. Therefore, generic feedback positioned as formative and provided in a collective manner could support students' learning. The hypothesis formulated in this instance is:

H3: Generic assessment feedback is likely to lead to an overall positive perception of feedback in an IS course.

Lecture Exercises Feedback

Over traditional lecture formats presenting course content material to large class groups, lecture exercises has been found to stimulate and enhance learning (Butler, Phillmann and Smart 2001). In lecture exercise, students are said to benefit from shared ideas and connect with other students (Bonwell 1996; McKeachie 1999). It can be postulated therefore that feedback provided within lecture exercises could influence student overall perceptions of feedback. This leads to our hypothesis that:

H4: Feedback on lecture exercises is likely to lead to an overall positive perception of feedback in an IS course.

Tutorial Activities Feedback

Engagement of students through active learning is said to facilitate learning processes (Bloom and Krathwohl 1956; McKeachie 1994; Weimer 2002). For example, active learning assignments in the form of in-class writing activities for psychology students were tested and found to enhance student learning, retention, and writing development (Stewart, Myers and Culley 2009). Feedback in this instance was provided to students on content and quality. Other attempts at class activities are also performance outcomes focused although interventions that investigated self-generated feedback impacting the development of meta-cognition, knowledge integration and self-efficacy can also be considered (Nietfeld, Cao and Osborne 2006). Overall, the literature on feedback is scant in terms of past attempts in exploring the various forms of feedback within tutorial activities and ultimately how student overall perceptions of feedback are impacted by feedback provided within such activities. In this study, the hypothesis tested within the context of tutorial activities is as follows:

H5: Feedback through tutorial activities is likely to lead to an overall positive perception of feedback in an IS course.

Overall perception of learning experience of an IS course

It is said that assessment generates most student attention and inquiries (Reynolds and Trehan 2000) since assessment is viewed by students as central to their university experience. One challenge teachers face is to find ways to encourage their students to both heed and learn from feedback in order to learn and enjoy their learning experience. The question is how do students view feedback? At which point is the learning process a feedback mechanism, and do students recognize this as part of their learning experience? Research by Beaumont, O'Doherty and Shannon (2011) show that students experience a radically different culture of feedback in schools and higher education, with the former providing extensive formative feedback and guidance, while the latter focuses upon independent learning that is often judged summatively.

Within higher education, feedback is provided to students with the expectation that this will promote learning and lead to improvements in subsequent pieces of work prepared by the student (Orsmond, Merry and Reiling 2005). Past studies have shown that student perceptions of instructor feedback have a

favourable impact on student satisfaction, learning outcomes and perceived learning overall (Eom, Wen and Ashill 2006; Hackman and Walker 1990; Richardson and Swan 2003). These previous studies were conducted in the context of online learning. Nevertheless, feedback is a motivating factor to students in general - this is viewed to contribute to the enhancement of their overall learning experience in a classroom context. Therefore, our final hypothesis is as follows:

H6: An overall favourable perception of feedback is likely to lead to a positive experience in an IS course.

The research methodology will be presented in the next section.

Methodology

This research adopts a positivist approach incorporating a quantitative methodology and methods. In line with such approach, hypotheses were derived from the scientific literature and were empirically tested using a survey instrument. Data collected were analysed using Structural Equation Modeling (SEM) with the Partial Least Squares (PLS) technique. The model was operationalised and analysed in SmartPLS 2.0. The PLS approach was preferable for this study because it provides a better predictive capability and it is effective in the analysis of a high complexity model with a small sample size, compared to a large number of independent variables. In addition, it imposes no requirement for a normal distribution assumption, which suits the nature of the data collected (Chin, 1998). All the items were measured based on a seven-point Likert scale ranging from strongly disagree to strongly agree and were operationalised as reflective indicators.

Empirical data were collected over the period of one month, at the end of semester 1 (March to June) 2013. The Introduction to IS cohort consisted of 402 students (potential participants), of which 80 students provided complete surveys. This converts to about a 20% response rate which reasonable for a study of this nature. It is worth noting that the survey administration and data collection and management were authorised by the University's committee on human ethics, which ensures that no adverse effects are likely to arise due to this research. The research design stipulated anonymity and all participation was voluntary. The survey was placed on Survey Monkey (a web based survey engine) for which the participants were provided with a generic link. Only generic data were sought with which participants cannot be identified.

In terms of participants' demographical information, 73 percent of the valid respondents were male and 26 percent were female; 84 percent had an age range between 18-24 years old; and 99 percent of the participants were full-time students. The majority of the participants were domestic students (85 percent), while 15 percent were international students. The PLS analysis and results of the data collected are discussed in the following section.

Results

Evaluation of Measurement Model

To ensure the accuracy of the structural model analysis, the validity and reliability of the scale developed need to be tested. The results obtained via the bootstrapping procedure including PLS loadings, T-statistics, Significance level, Composite Reliability, Average Variance Extracted (AVE) and Cronbach's alpha suggest that our measurement model demonstrates sufficient discriminant validity and internal consistency. Chin (1998) suggests that the loading should be greater than 0.707. Most of the reflective scales demonstrated acceptable performance above the minimum value of composite reliability, which is greater than 0.7. Overall, the condition of the loading scores was met in this study and the T-statistics revealed that all the items were at a significant level of 99 percent. A measurement item of feedback from peers, which is peer2 (0.693859) and summative assessment feedback, which is sum3 (0.684087) present scores slightly lower than the threshold, but are in an acceptable range. Given that these are newly developed items and the scores are in an acceptable range, we included them in the model.

Composite reliability, AVE and Cronbach’s alpha calculated by PLS are suitable for assessing internal consistency (Chin 1998). All the reflective scales demonstrated acceptable performance above the minimum value of composite reliability, which is greater than 0.7. Additionally, the standard for reliability dictates that the AVE scales should exceed 0.5, indicating that “50 percent or more variance of the indicators should be accounted for” (Chin 1998, p. 321). A Cronbach’s alpha of greater than 0.7 is regarded as an acceptable level of variable reliability. It can be seen that all the scales performed acceptably on this standard.

Furthermore, the discriminant validity can be evaluated by comparing the AVE of the latent variables and the correlations among the Latent Variables (LVs). Table 1 presents the correlation of variables and the variables’ respective square roots of AVEs obtained by PLS analysis. It can be seen that most of the square roots of AVEs are significantly greater than their corresponding correlations, with an exception of task efficiency that shows slightly higher scores to data quality and overall benefits variables. This confirms that most of the indicators measuring a particular LV do not improperly overlap with other LVs’ concepts and that discriminant validity has been met. In addition, the cross-loadings procedure in PLS was utilised. While these loadings are not shown because of space limitations, each indicator loaded higher with its corresponding latent variable as theorised in the conceptual model. Thus, the results from the square roots of AVE and cross loading analysis demonstrate that all measurement scales have discriminant validity in an acceptable level (Zhu et al., 2010).

Following the confirmation of validity and reliability of the measurement model, the results of the structural model are presented below.

Table 1 Correlation of variables compared to square root of AVEs

Measures	Feedback from Peers	Summative Assessment Feedback	Generic Assessment Feedback	Lecture Exercises Feedback	Tutorial Activities Feedback	Overall Perception of Feedback	Overall Learning Experience
Feedback from Peers	0.813543*						
Summative Assessment Feedback	0.493454	0.84456					
Generic Assessment Feedback	0.405088	0.541435	0.863185				
Lecture Exercises Feedback	0.514922	0.475955	0.637015	0.873178			
Tutorial Activities Feedback	0.395152	0.585178	0.626075	0.521824	0.891395		
Overall Perception of Feedback	0.432918	0.680187	0.738385	0.617784	0.570445	0.91676	
Overall Learning Experience	0.268180	0.371678	0.602116	0.555638	0.571571	0.636384	1.00000

*Figures in bold are the square roots of AVEs.

Structural Model Results

The results of the structural model generated by PLS are presented in Figure 2. The predictiveness of the model can be assessed by the R² of the dependent variables. The results show that R² of the overall course

experience is 0.405, which indicates that overall perception of feedback accounted for 40 percent of the variance of the overall perception of learning experience variable. In addition, the R² of the overall perception of feedback is 0.673, which indicates that independent variables (feedback from peers, summative assessment feedback, generic assessment feedback, lecturer exercises feedback and tutorial activities feedback) accounted for 63 percent of the variance of the overall perception of feedback variable.

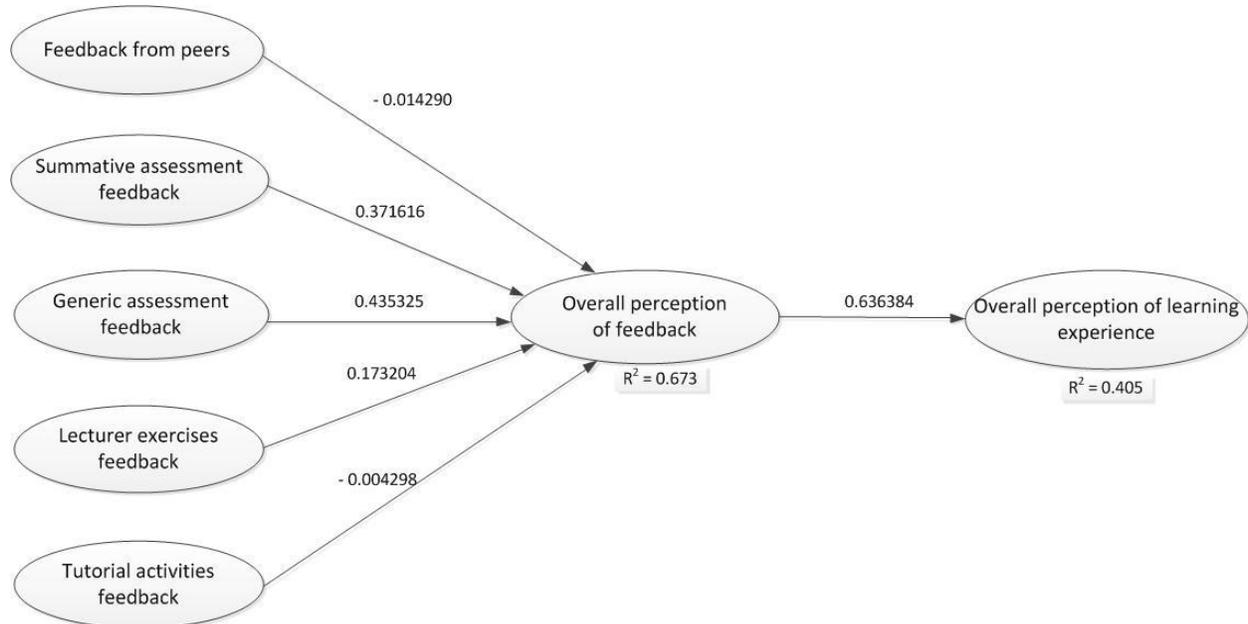


Figure 2: Results of statistical analysis

Table 2 Summary of path coefficient test results

	Hypothesis	Actual Effect	Path Coefficient	T-statistics	Significance Level
Feedback from Peers -> Overall Perception of Feedback	H1	-	0.014290	0.150208	Not significant
Summative Assessment Feedback -> Overall Perception of Feedback	H2	+	0.371616	4.062722	0.01
Generic Assessment Feedback -> Overall Perception of Feedback	H3	+	0.435325	4.852619	0.01
Lecture Exercises Feedback -> Overall Perception of Feedback	H4	+	0.173204	1.348358	Not significant
Tutorial Activities Feedback -> Overall Perception of Feedback	H5	-	0.004298	0.052972	Not significant
Overall Perception of Feedback -> Overall Learning Experience	H6	+	0.636384	10.665706	0.01

Table 2 presents the statistical outcome obtained through the bootstrapping procedure of PLS (that is actual effect, path coefficient, T-statistics, and significance level). The statistical findings support hypotheses 2, 3 and 6 and reject hypotheses 1, 4 and 5. This indicates that summative assessment feedback and, generic assessment feedback have significant positive effects on the overall perception of feedback, while the overall perception of feedback has significant positive effect on overall perception of learning experience. On the other hand, feedback from peers, lecturer exercises feedback and tutorial activities feedback do not have significant influence on the respondents' learning experiences in the IS course.

The path coefficient between overall perception of feedback and overall learning experience shows the strongest relationship of 0.636384 at 99 percent significance level. This implies that when students have positive attitude toward the feedback that they receive, they are likely to have a better learning experience.

In terms of interdependent variables that influence the overall attitude of feedback, the result shows that the path coefficient between generic assessment feedback and overall perception of feedback has the strongest relationship with 0.435325 path coefficient, followed by summative assessment feedback with 0.371616 path coefficient at 99 percent significant level. This implies that when students receive feedback on generic assessment and summative assignment, they will have a better attitude towards the overall feedback received.

Analysis and Discussion

In responding to the research questions, the results first shed a light on the feedback mechanisms that were perceived as important by students in an introductory IS course. The results indicate that assessment related feedback, both generic (formative) and summative, were perceived as significant to formulating an overall perception of feedback in this context. While this was somewhat anticipated (e.g. Smith and Gorard 2005), the fact that other forms of formative feedback were not perceived as significant to such formulation was noteworthy. Such feedback ranged from peer feedback, including a peer-assessed formative quiz, and regular feedback on joint projects and activities, as well as formative feedback from instructors on lecture exercises and tutorial activities. What this indicates is that first year IS students are overwhelmingly assessment focused. This is consistent with several studies in the 1970s that found that assessments had a stronger influence on students than teaching (Snyder, 1971; Miller & Parlett, 1974), either due to the idea of the 'hidden curriculum' (Snyder, 1971) or cues about what was actually rewarded in the assessment system (Miller & Parlett, 1974). This is said to actually detract students from actual learning. Alternatively, this could also be due to students needing guidance in interpreting non-assessment-related feedback in order for them to appreciate the different forms of feedback (Jolly & Boud 2013; Weaver 2006). The integrative interpretation could then help them link the other forms of formative feedback to how they might improve, allowing them to work towards better performance and having a strategy to get there. While this has been the case in our context, a deeper maturity and awareness of the broader competencies acquired through multiple forms of feedback seems to take longer to develop. This calls for further research in latter years of study in order to explore the development of a broader competency based-perspective. It is important to determine the level/timeframe at which an IS student would start to increasingly think of themselves as a prospective professional with competencies, skills and graduate attributes that go beyond assessment based proficiencies to industry oriented competencies.

Moreover, this also necessitates the incorporation of activities to further highlight the different forms of feedback and their importance to the learner. Beaumont et al's study (2011) suggests that feedback should not always be event-based or assessment-based, but that it should be embedded in formative activities, with the provision of pre- and in-task guidance, and reducing summative assessment feedback at the post-submission stage to develop self-directed and scaffolded learning. While a number of such activities were introduced to students in our empirical context, they do not seem to have made a significant impression on the learners. For instance, the course incorporated several case-based assessments constructively aligned with case-based tutorial activities that students had to undertake on a weekly basis in tutorials. Students received regular and timely formative feedback on their tutorial work from their peers and instructors during every tutorial. The fact that such feedback was constructively aligned with their assignment work was also highlighted, but was statistically perceived as insignificant within the context of the survey. Further cognitive and developmental teaching approaches may therefore prove essential in developing a better perspective of such feedback, where student develop a conception of themselves as

learners and “learn how to learn” (Toohey 1999, p.55). According to this view, for instance, knowledge is personally constructed, therefore the questioning skills of teachers are of utmost importance, as they help students attain depth in their critical analysis which they would be unlikely to attain otherwise. Students’ intellectual development is at the heart of this approach, and their interests and motivations are continuously nurtured in an encouraging environment, rich with positive reinforcement and ongoing feedback, support and guidance. This may contribute to the development of a deeper appreciation of other forms of formative feedback and their significance.

Towards such effect, there seems to be a need for a holistic view of feedback to mirror Brookfield's (1995) four lenses recommended for critical and reflective teachers, which invites instructors to reflect on their teaching through adopting a student lens, a peer lens, a literature lens, and an autobiographical lens. The authors therefore call for corresponding lenses for a critical and reflective learner, which entice the learner to improve their learning processes through critically reflecting on feedback they receive from their peer, instructors, pedagogical literature, and self-evaluation. This will provide for optimal learning-teaching processes based on thorough reflection and appreciation of the multiple forms of feedback provided. Curricular designers, coordinators, and instructors could facilitate such reflections through providing students with tools, opportunities, and resources aimed at developing critical and reflective practice.

In relation to the second research question raised by this study, the results clearly indicate a very strong relationship between an overall perception of positive feedback and a favourable experience in an introductory IS course. This aligns with previous research that highlights the importance of feedback in the learning process (Sadler 1998; Orsmond et al. 2005; Hattie et al. 1996; Black and Wiliam 1998; Hattie and Jaeger 1998). However, these empirical findings shed a particular light on the perception of a positive experience that a student encounters through formulating a positive perception of feedback they receive. Consequently, it could be argued here that feedback is fundamental for a positive learning experience. This validates the approach taken in this course in providing a broad-spectrum of feedback mechanisms, which for instance includes for assessments: individual summative feedback; individual written formative feedback; generic written feedback guide; generic verbal feedback from the marker at each tutorial session; generic verbal feedback from the course coordinator; individual verbal feedback opportunities from the marker (should the student request it); and individual verbal feedback opportunities from the course coordinator. Similar relevant feedback processes were also made available for all learning activities and exercises in the course. Anecdotally, these seem to have contributed to a positive perception of experience also noted in the students’ formal evaluation of the course.

Implications

Theoretical

To the authors’ knowledge, this is the first study to provide a holistic model for understanding how different perception of feedback mechanisms contributes to an overall view of feedback. This therefore provides an important contribution to pedagogical literature with a predictive model, based on the PLS technique, that has been empirically tested. Moreover, the findings highlight the importance of feedback to learners’ perceived experience in an introductory course which was also found to be very significant.

The findings provide for an insight into perceptions of feedback by the learner, which go beyond traditional research in the pedagogical feedback context, and its general prescriptive focus to providing feedback. This calls for future research that encompasses prescription of good feedback practice as well as the perceptions of such feedback by students – along with means to improve such perceptions.

Practical

From a practical pedagogical perspective, based on the findings of this research, the authors propose that survey instruments for students’ evaluation of courses and instructors need to include items for evaluation of different forms of feedback. This would provide curricular designers and instructors with a clearer and more holistic view of the effectiveness of feedback processes deployed in a particular course. Moreover, it is also advisable that multiple evaluations are undertaken over the course of a semester (e.g. week 4; week 8; as well as end of semester) so that remedial measures could be put into place in order to fine-tune feedback processes. Coordinators and instructors are advised to administer such evaluations

themselves (should this does not infringe on academic policies) if there is no opportunity to do so through university processes, or if they get no access to such results in a clear, comprehensive, and timely manner.

Conclusion

The findings indicate that in the context of this introductory IS course, summative and generic (formative) assessment feedback were perceived by students as significant in contributing towards an overall favorable assessment of feedback in the course. In turn, a positive overall assessment of feedback was found as significant towards formulating a positive experience in an introductory IS course.

Notwithstanding its contributions and implications, this study has several limitations. The empirical data collection was conducted for a single cohort of students enrolled in a single course. Future research could target different cohorts particularly at latter years to see if such feedback perceptions change as students gain academic competence and maturity. Further insight could also emanate from studying students in different degree programs and in different cultural contexts. Moreover, research approaches that accommodate qualitative data may also provide good insight as to why and how feedback perceptions emerge and evolve over time.

The findings call for a more thorough appreciation and investigation of feedback perceptions by learners and into developing a border perspective to feedback, particular in IS courses.

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