Chang et al.

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Electronic Feedback or Handwritten Feedback: What Do Undergraduate Students Prefer and Why?

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Abstract

Giving feedback on students' assignment is, by no means, new to faculty. Yet, when it comes to handwritten feedback delivered in person and typed feedback delivered electronically to students, faculty may not know what undergraduate students prefer and reasons behind their preferences. The present study explored which form of feedback, i.e., electronic or handwritten feedback, undergraduate students preferred and rationale behind their preferences. Two hundred fifty respondents completed an online survey, which consisted of three closed-ended questions and two open-ended questions. Nonparametric tests were used to analyze the quantitative data. Qualitative responses were read and analyzed by four researchers and six themes were identified. The qualitative data were rechecked against the six themes independently first and then collectively. Discrepancies were discussed before complete consensus was made. The study found that nearly 70% of the participants preferred e-feedback for its accessibility, timeliness, and legibility. Yet, with respect to the quality of feedback, the majority of handwritten supporters chose handwritten feedback, as they perceived this type of feedback as more personal. The article discusses the marked discrepancies between the two groups and ends with educational implications and suggestions for future research.

Keywords: feedback, electronic feedback, handwritten feedback, teaching and learning, instructors, students

I. Introduction

Feedback is important to student learning (Case, 2007*;* Ferguson, 2011; Krause & Stark, 2010) and a basis for supporting and regulating the learning process (Ifenthaler, 2010) regardless of

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who students are and where they are from and regardless of what form instructors choose to provide feedback on students' assignments, be it electronic feedback or handwritten. Quality feedback should work as a guiding light, promoting student learning (Chang, 2011). Krause and Stark sampled 2,137 university students and found that individual learning with feedback had significant effects on student learning. Increasingly students are demanding feedback from their instructors (Siew, 2003). Yet, students' perceptions of different forms of feedback are some times inconsistent and contradictory (Krause & Stark, 2010). The main objective of this study, therefore, was to examine which undergraduate students preferred; handwritten or electronic feedback and to understand the underlying reasons for these preferences.

II. Theoretical Framework

A. Indifference to Feedback.

Some instructors do spend time providing feedback directly onto hardcopies of students' assignments (handwritten feedback) while others use a keyboard and send feedback electronically to students (electronic feedback). The National Union of Students (NUS) Survey (2008) reported that 85% of respondents did receive written comments. However, Winter and Dye (2004) found that despite time and work exerted by instructors to offer students feedback, some students did not even collect their feedback (Wojtas, 1998 in Higgins, Hartley, & Skelton, 2001). Sinclair and Cleland (2007) concurred, as a result of a survey study with undergraduate medical students, that fewer than half of the students did not want to be bothered to collect feedback when given a choice. Other students simply gave a quick glance to grades before slipping their assignments into backpacks (Wojtas, 1998 in Higgins, Hartley, & Skelton, 2001). Wojtas (1998) furthered, "Some students threw away the feedback if they disliked the grade, while others seemed concerned only with the final result and did not collect their marked work" (in Higgins, Hartley, & Skelton, 2001, p. 270). Still others justify that they do not appreciate feedback returned to them late (Winter & Dye, 2004).

B. Discontent with Feedback.

Discontent among students with the quality of instructor's feedback was commonly noted in the NUS Survey (2008) and Quality Assurance Agency for Higher Education (2007). After surveying 465 graduate students and 101 undergraduate students at a major Australian university, Ferguson (2011) substantiated that feedback failed to play the role as it was expected. Price, Handley, Millar & O'Donovan (2010) had a similar observation. Students felt feedback given on assignments was often vague and ambiguous, making it hard to follow. Additionally, students complained that feedback was overly negative and not useful to them. It might be a reason that students were less likely to act on feedback to improve their subsequent work. All seemed to think that instructors were not willing to spend time writing helpful feedback and did not seem to care about student learning (Price et al., 2010). In all, 90% of students at 14 Australian universities (Scott, 2006) described feedback they were getting as insufficient.

C. Expected Feedback.

To improve their learning, students want useful and high quality feedback. With the promise of feedback, students would be happy to wait, even if it would be a little longer (Ferguson, 2011). Research indicates that students attach greater importance to quality and detail than to timing in regard to feedback, even though timeliness is continually described as an important component of effective feedback in any form (Bai &Smith, 2010; Bridge & Appleyard, 2008; Denton, Madden, Roberts, & Rowe, 2008; Price et al., 2010; Scott, 2006).

      With the growing demand for online course delivery, more instructors are offering electronic feedback. Timeliness of electronic feedback has been found helpful to students' learning (Dickinson, 1992; Seliem & Ahmed, 2009). Electronic feedback also encourages students to be responsible for their own assignments, facilitates collaboration, and increases student participation (Seliem & Ahmed, 2009). It also allows an instructor to review, clarify (Chang, 2011), and "tone down criticism" on feedback (Dickinson, 1992, p. 6). Feedback is one of the imperative factors affecting students' perceptions of course quality (Yang & Durrington, 2010). Yet, some students distrust the receipt system if feedback is delivered electronically (Bridge & Appleyard, 2008). Studies have reported some students' antipathy toward electronic feedback (Ferguson, 2011; Scott, 2006). One of the disadvantages of e-submission is a lack of social interaction, as it lacks personal touch. Since learning remains a profoundly social experience (Scott, 2006), students expressed their hunger for more opportunities to have a dialogue with instructors (Price et al., 2010).

      Some research has found that handwritten feedback is personal (Morgan & Toledo, 2006). Others (Denton et al., 2008; Ferguson, 2011; Price, et al., 2010) have reported that handwritten feedback is difficult for students to read, due to illegible writing. Students may not perceive that handwritten feedback is part of the process that would help them improve their performances (Dickinson, 1992). As such, it is felt that the interactive face-to-face communication would help clear up students' concerns and offer reassurance. Nonetheless, NUS (2008) found that only 25% of the respondents set up individual meetings with instructors, because setting up face-to-face meetings "was dependent on a good relationship with the tutor; such good relationships where they felt comfortable to go and ask for verbal feedback" (NUS, 2008, p 31). This may indicate that it was not because those students would want to intentionally avoid individual meetings, but it was because they might not feel they had good relationships with instructors.

      One overlooked aspect in defining feedback is a *feed-forward* component (Price, 2010), the opportunity for students to use the information to affect future work. It is a cyclic and ongoing in the process of longitudinal development (Denton et al. 2008), stemming from dialogues between instructors and students (Price et al., 2010). Students may inappropriately view each assignment as a discrete final project and regard feedback as simply justification for a given grade without this feed-forward opportunity. If feedback is considered a finished product, merely to correct errors on assignments, or if it is not delivered in time for student action, it is ineffective and more than likely ignored (Dickinson, 1992; Gibbs & Simpson, 2004; Price et al., 2010). Evaluative feedback can become useful and meaningful when there is a consensus on shared understanding between instructor and student about the purpose of feedback (Case, 2007; Price et al., 2010; Seliem & Ahmed, 2009). When give-and-take opportunities exist throughout the ongoing, cyclical process, instructors can offer additional explanations or elaborations on feedback (Hattie & Timperley, 2007; Price et al., 2010). This practice can clarify the information instructors have disseminated to students about their work and thereby help improve learning outcomes (Denton et al., 2008). In an assessment continuum between student and teacher, feedback and instruction are intertwined (Hattie & Timperley, 2007) as a component of an

ongoing dialogue between the stakeholders, increasingly desired by students (Price et al., 2010). Hence, feedback is most effective when it is understandable to the extent that learners are able and willing to use it and when instructors focus on "*how to improve*" subsequent learning (Ferguson, 2011, p. 56, author added emphasis). The assessment process should not be a "bolt-on addition at the end" of the curriculum, but "an integral part of the educational process" (National Curriculum TGAT Report, 1987, p. 6). Both feedback and feed-forward should be an ongoing part of the educational process in a forward-looking relational process, allowing students to use the information to improve subsequent assignments (Dickinson, 1992; Gibbs & Simpson, 2004; Price et al., 2010).

III. Methods

A. Participants.

This study invited 664 undergraduate students from the School of Education at a Mid-western university to take part in an investigation of students' preference for either handwritten or electronic feedback and their rationale for this preference. Two hundred seventy nine students responded, making the return rate 42%. Out of 279 respondents, 29 respondents did not complete all of the survey questions. As these surveys were incomplete, they were discarded from the sample, leaving the total sample of 250 with a response rate of 38%.

Except for seven students (3%) who did not report their gender, among 250 participants, 80% were female, while 17% were male. Except for two who did not report their age, there were 147 participants (59%) ranging from 18 to over 45 years of age. Except for 19 students 8% failed to report their GPA, most participants 65% indicated that their GPA was 3.01-4.00. Over half of all respondents 66%, described their major as elementary, while 33% self-identified as secondary education majors (see Table 1 and Table 2).

Table 1. Gender and age

Variable	*n*	%
Gender		
Female	200	80
Male	43	17
Missing	7	3
Age		
18-24	147	59
25-34	61	24
35-44	27	11
45 & Over	13	5
Missing	2	1

Note. All percentages add up to 100%

Chang et al.

Table 2. Class Standing, GPA and major

Variable	n	%
Class Standing		
Freshman	47	19
Sophomore	58	23
Junior	58	23
Senior	82	33
Missing	5	2
GPA		
3.01-4.00	164	65
2.01-3.00	62	25
2.00 & Below	5	2
Missing	19	8
Major		
Elementary	165	66
Secondary	70	28
Special Ed.	14	5.6
Missing	1	0.4

Note. All percentages add up to 100%

B. Research Design.

To best understand the research problem, a mixed methodology approach was used in the study, which obtained different but complementary data on student perceptions pertaining to handwritten or electronic feedback. It also combined the differing strengths and weaknesses of quantitative methods (large sample size, trends, generalization) with those of qualitative methods in the form of a questionnaire.

C. Instrument.

An online application of Lime Survey was used to collect data. The survey questions were developed by the four researchers and reviewed by a faculty member with expertise in instructional technology. In light of his suggestions, the questions were revised and refined until consensus was reached. The survey instrument consisted of three closed-ended questions: 1) Which kind of feedback do undergraduate School of Education students prefer – handwritten or electronic, 2) To what extent do School of Education undergraduate students prefer either handwritten feedback or electronic feedback, and 3) How useful was your instructor's feedback? In addition to questions of demographic information including: gender, age, class standing, GPA (grade point average), and major; there were also two open-ended questions: 1) I prefer handwritten feedback because . . . (this question was answered by handwritten supporters) or I prefer electronic feedback because . . . (this question was answered by e-feedback supporters), and 2) Do you have any other comments to make about assessment feedback that may help

faculty better facilitate your learning? (This was asked of both groups of supporters). In the survey, handwritten feedback was defined as feedback that is written by hand on students' assignments and physically delivered to students." The definition of electronic feedback was "feedback that is typed and shared electronically with students via emails, forums, Facebook, etc.
D. Procedure.

Two weeks after the spring semester of 2012 started, all undergraduates admitted into the teacher preparation program were invited to participate in the study via an email. The potential participants were then redirected to the online site where they were first prompted with a consent letter, which informed them of the purpose of the study, ensured confidentiality and also made it clear that participation was voluntary. If potential respondents agreed to participate, they continued on to complete the questionnaire. Students could stop or quit answering the questions at any point they liked. All potential participants received a first follow-up letter electronically three weeks after the initial invitation letter was sent out. A second follow-up letter was emailed to all potential participants three weeks later.

E. Data Analysis.

To answer the first research question of whether the undergraduate students of the School of Education preferred electronic or handwritten feedback, nonparametric tests were utilized. SPSS 19 was used to answer part of the second research question of why either of these options was preferred over the other. A crosstabs procedure, using the Chi-square Test of Independence was used to analyze the nominal variables. A Chi-square Test of Independence measures the degree to which a sample of data comes from a population with a specific distribution (Bakerson, 2009; Mertler &Vanatta, 2005 Rosenberg, 2007; Stevenson, 2007). It tests whether the observed frequency count of a distribution of scores fits the theoretical distribution of scores. This issue was addressed through the use of the Pearson's Chi-square procedure (Bakerson, 2009; Mertler & Vanatta, 2005 Rosenberg, 2007).

The rest of the second research question was answered thorough the analysis of qualitative responses, which consisted of coding the survey responses and of aggregating the codes to identify themes (Charmaz, 2000; Creswell, 2002). Four researchers read and analyzed the respondents' responses with respect to their justifications of preferences for handwritten or electronic feedback, and their responses to the last survey question: "Do you have any other comments to make about assessment feedback that may help faculty better facilitate your learning?" Six themes were identified, which include: accessibility (A), timeliness (T), legibility (L), quality of feedback (Q), personal (P), and miscellaneous (M) (see Table 3 and Table 4). In light of the themes, the researchers went back to check the codes and then discussed the discrepancies of the coding through two meetings. The inter-rater reliability was 0.82 for electronic feedback preference, 0.84 for handwritten feedback preference, and 0.72 for the last question. The qualitative responses under each theme were then calculated to answer the second question of why the respondents preferred one form of feedback over the other and what they valued the most in terms of those six themes.

Table 3. Coding with themes and examples for accessibility and timeliness

Codes	Themes	Example Quotes
A	• Able to get information easily • Convenience • Able to ask questions • Secure	• I spend the majority of my time on the computer. • I am able to access the information needed without having the hard- printed paper(s). Can access information anytime I have wireless connection through phone/laptop/or computer. • I check my email several times a day so that is what is convenient for me. Also, getting electronic feedback means that i will always be able to go back to it without losing it, whereas a handwritten feedback you can lose or misplace. • I can ask the professors in class what they mean if I have questions about it.
T	• Readability • Understanding	• I also appreciate that electronic feedback is a faster way to receive constructive feedback.

Note. Accessibility (A), timeliness (T)

Table 4. Coding with themes and examples for legibility, quality, personal and miscellaneous

| Codes	Themes	Example Quotes
L	• Quick return	• [Y]ou don't have to wonder what a comment says due to poor penmanship, • Sometimes it is harder to read hand written feedback.
Q	• Constructiveness • Usefulness • Helpfulness • Understanding the content • Revise and improve • Summary vs. In-Text comments (location) • More detail is better • Canned responses • Physical touch	• I like handwritten feedback on tests because they can point out exactly where I messed up and explain it right on the test. • I can see what my answers were and see what was wrong, why it was wrong and what the instructor thought. I also like to be able to touch the actually feedback because for some reason I feel like I understand it better when I can touch it.
P	• Close rapport between student/professor • Feeling obligated to read • Appreciation • Caring about students	• When I receive handwritten feedback I feel that my professor entered into a dialogue that required reflection, interpretation, and evaluation on my performance as a student. By providing me with handwritten feedback, I feel that the professor took the the time to personalize their thoughts on my performance as a student and per-service teacher. • Handwritten feedback is something I usually feel more obligated to read as it is all on my returned assignment.
M	• Wish • Use of Oncourse, gradebooks • Use of Word Review features	• [T]he feedback has to be precise not just "good work" • [I]t saves paper, • I believe in going paperless to many extents, but when it

Chang et al.

• Save paper	comes to engaging with comments or feedback, having a marked up paper with comments and input is the most helpful.

Note. legibility (L), quality of feedback (Q)personal (P), and miscellaneous (M)

IV. Results and Discussion

A. Preference.

The majority of SOE participating undergraduate students (68%) preferred electronic feedback/e-feedback to handwritten feedback (34%). The primary reason for those who supported e-feedback was accessibility, which accounted for 38% of the comments made by the e-feedback supporters (see Figure 1). In the following, along with the quantitative results, discussed are six identified themes, including: accessibility, timeliness, legibility, quality, personable, and miscellaneous.
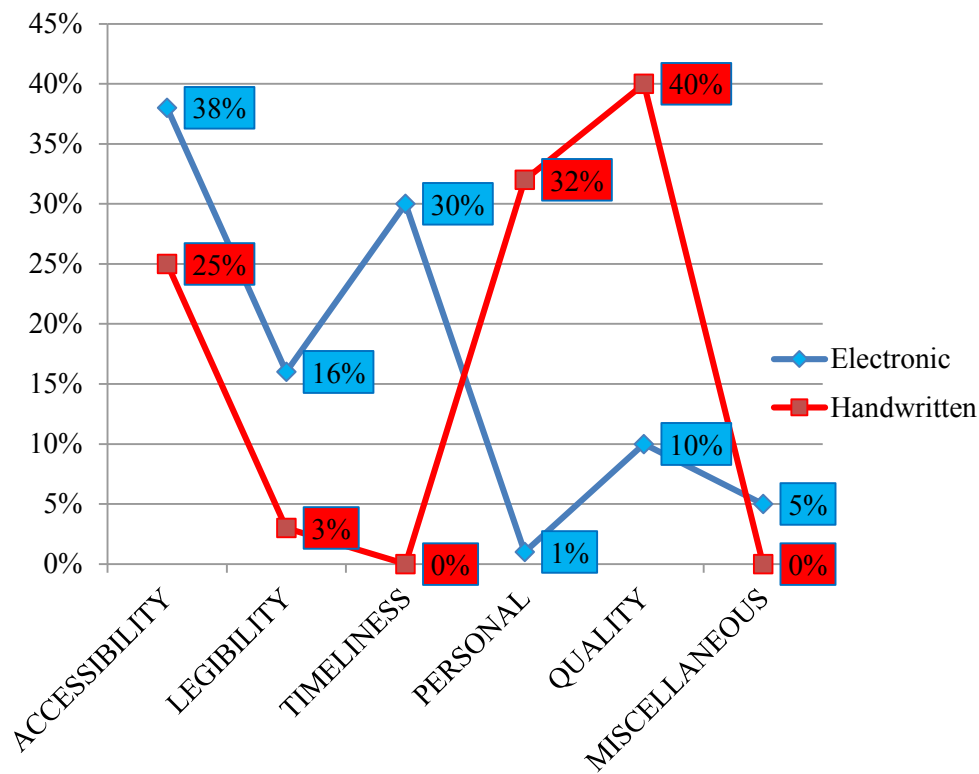
Figure 1. Qualitative responses by electronic and handwritten feedback supporters by six themes

B. Accessibility.

The respondents most commonly noted that they were able to receive feedback effortlessly and found it convenient for their professors to provide electronic feedback. In addition, given that the Internet is omnipresent, it is also easy for students to check feedback, as they have laptops,

Chang et al.

smartphones, iPads, and other mobile devices: "I prefer electronic feedback because you get to check your emails." "I am able to see the feedback right away through my phone, and anywhere else I have [I]nternet access." ". . . I am generally always available to get to my laptop. I'm on my laptop so much that it just makes it easier for me." Chang (2011) confirmed that instructor's responses could conveniently be received electronically and entirely independent of location and time. Those who supported electronic feedback also felt that e-feedback could be easily organized. The possibility of misplacing papers would be unlikely, so was carrying around papers. One student commented, "I prefer the electronic feedback because it is easier to keep a record of and less likely to become misplaced." In this sense, they also noted that they felt secure.

In contrast, 25% of the comments made by the respondents supporting handwritten feedback were on accessibility (see Figure 1). The respondents rationalized that handwritten feedback was independent of the Internet, which was convenient for their learning: "I like to read the handouts in my own time anywhere I want without having to get on a computer and see it." "Currently, [m]y life is very busy, the feedback written on my papers is sufficient." "I am able to take it home with me and really look at it. I can also make extra notes on the handwritten feedback that I get." These comments were supported by Chang (2011) that those who did not own computers and/or who did not have easy access to the Internet did not support e-feedback.

B. Timeliness.

Timeliness is the second reason for those who favored e-feedback (30%) (see Figure 1). Students explained, "It can get back to the student quicker especially if they are in a once a week class." "[I]t is usually a much faster turn-around; the feedback comes back much quicker." "I . . . appreciate that electronic feedback is a faster way to receive constructive feedback." Some respondents associated timeliness with the ownership of learning: "It is faster! I am more likely to respond!" "I can also respond quickly from any location." Immediate feedback was helpful to students' learning, as the content just discussed in classes is still kept fresh in their minds (Chang, 2011; Dickinson, 1992; Ferguson, 2011, Seliem & Ahmed, 2009; Winter & Dye, 2004). It could be the very reason that students were likely to respond to e-feedback. Electronic feedback encouraged students to be responsible for their own assignments and active participation (Chang, 2011; Dickinson, 1992; Nicol & Macfarlane-Dick, 2006; Seliem & Ahmed, 2009). In comparison, those who preferred handwritten feedback did not make any comments on timeliness (see Figure 1).

With handwritten feedback, timing is one of the major reasons for students' dissatisfaction (Ferguson, 2011; Winter & Dye, 2004). Mostly, when instructors are able to return students' assignments with feedback, it is when there are class meetings on campuses. If feedback is returned to students rather late and if students have already moved onto the next assignments or tasks, feedback would become useless to student learning. Students explained, "A lot of time I get this feedback before the next class and before I have started the next homework. I have another class where the teacher does it all by hand and it takes forever to get the feedback and the next homework is due before the feedback gets back to me." "I think that instructors should allow time to provide feedback on all assignments before an exam or written assignment is given over that material. I have taken exams without feedback from prior assignments that covered material that was on the exam. This seems that instructors are simply going through the motions of handing out assignments then testing on the material. How am I

supposed to know what I need to study, if I do not know what I misunderstood on the assignment portion?" These comments imply feedback after all is essential to student learning if students are able to benefit from it (Chang, 2011; Dickinson, 1992; Ferguson, 2011, Seliem & Ahmed, 2009; Winter & Dye, 2004).

C. Legibility.

Legibility (16%) is the third reason given by those who supported e-feedback (see Figure 1). The respondents explained that typed messages allowed them to read without much difficulty; they did not have to guess what comments were intended to say to them. At least, students did not have to make a special visit to professors just decipher what was written, as commented by some students: "[D]on't have to track down a professor to help read what [he] wrote." "[W]hen their responses are typed[,] I can clearly read . . . their input. . ." This is supported by prior research which found that handwritten feedback was difficult for students to read, due to illegible writing (Denton, 2008; Ferguson, 2011; Price et al., 2010). In other words, if students are able to read comments, they can "hopefully use their (professors') input." This signifies that students care about their learning and want feedback to better their work (Ferguson, 2011). Yet, when it comes to the quality of e-feedback, surprisingly, only 10% of the respondents supporting e-feedback made comments on this topic (see Figure 1).

D. Quality.

This section reports and discusses the data with respect to quality of feedback. In order to help the reader follow the results and discussion with ease, there are two sub-sections with one focusing on the views of e-feedback supporters while the other on views of handwritten supporters.

Perceptions of electronic feedback supporters. Ten percent of the comments made by the e-feedback supporters were largely about how feedback helped them learn. That is, the respondents recognized that instructors were able to explain their thoughts completely. Feedback was specific and detailed, as some wrote, "I . . . feel that electronic feedback gives instructors a chance to fully explain their thoughts and consideration." "I find comments are more thorough." A student also acknowledged that instructors took time, reading students' submitted work: "Professors take more time to respond to what I wrote, the comments written about my work seem to be more thought out and I can read them with an understanding of where the professor is coming from . . ." A clear expression of wanting to improve their performance can also be observed from the respondents' comments: "Electronic feedback gives a student a chance to read, then review the written feedback later. This is important because student[s] can improve and learn from feedback." Chang's (2011) study confirmed that students appreciated the time instructors spent in providing detailed feedback on their assignments. The feedback was helpful and useful to their learning.

Some respondents underscored the role technology plays in providing quality feedback, as technology allows for easy typing, which could lead to more detailed feedback. Students said, ". . . I find electronic feedback is more specific and detailed (perhaps because typing is faster?)" "I feel electronic feedback tends to be more detailed because typing is faster for most than handwriting." "It also is more in depth because the professor is not trying to condense it into the margin of my work." From some students' viewpoints, if feedback was sent to them

electronically, they seemed able to receive more from professors: "[P]rofessors tend to give more comments when feedback is given electronically." In addition, technology enables instructors to place feedback near areas where students are able to understand specifically what was done well and what they need to improve. A respondent wrote, "On a paper, professors can provide feedback in certain spots in Microsoft word, indicating exactly where they agree or think could use some work." This finding echoes the report by Chang (2011) that students wanted feedback that was specific and that enabled them to know what needed their attention. Moreover, students felt that using technology to offer feedback could turn sharp criticism into something easier for them to accept, as a student said, "[E-feedback] is more like constructive criticism than just criticism." This is in line with the findings of Chang (2011) and Dickinson (1992) that using technology to compose feedback allows an instructor to review, clarify and tone down criticism. However, taking advantage of technology does not seem widely used with all instructors, which seems a cause for concerns. Some respondents pointed out, "There is a feature in [M]icrosoft [W]ord where as a professor you can highlight words of phrases and sections and add specific feedback for that word or phrase. . ." "We live in a world full of technology and so many of us get online frequently throughout the day . . ."

Inconsistent with Chang's (2011) study is the priorities the present study respondents ranked. The e-feedback supporters preferred e-feedback predominantly due to accessibility (28%) and timeliness (20%) (see Figure 1). Quality of feedback fell in the distance third, whereas the participants in Chang's study enjoyed the feedback due to the quality of feedback. The students placed the accessibility in the distance second and timeliness the third. The low percentage of comments (10%) on the quality of feedback in the present study could indicate that at the time when the survey was administered, e-feedback might still be something new to most students, considering nearly 60% of the respondents were between ages 18-24. Although technology is by no means novel to this generation, receiving e-feedback from instructors might not be something familiar to them; they are much more conversant with handwritten feedback than e-feedback.

Perceptions of handwritten feedback supporters. In comparison with the percentage of comments on the quality of feedback made by those preferring handwritten feedback (40%) (see Figure 1). A number of comments were four times more than those made by the respondents with a preference for e-feedback (10%). The handwritten feedback supporters appeared to have attached much greater importance to the quality of feedback than the e-feedback group, rating this category as a key ingredient for success. Like those who preferred e-feedback, the qualitative responses made by handwritten feedback supporters conveyed a similar justification; the feedback was placed in proximity to what needed to be worked on and what was done well, "I enjoy having handwritten feedback because usually handwritten feedback is placed on papers in the areas that need to be fixed." "I can . . . look at exactly where and what the feedback is about and can improve off of that, where as if it is electronic I can not necessarily see exactly what the feedback is talking about or how to improve." Like e-feedback supporters, handwritten feedback supporters also pointed out that when professors wrote feedback by hand on their assignments, the feedback tended to be more detailed and specific than when given electronically. The respondents said, "I felt that my professors actually took the time to read and evaluate my performance and in doing so allowing each of us to get to know each other on a better level by being able to discuss the comments right then and there." "[I] feel like the instructor will say more with handwritten feedback rather than with electronic. With electronic they tend to be short with comments and few." Yet, what is different from the responses made by

the e-feedback group is that feedback written by hand is more tailored to an individual learning level: ". . . it is ni[c]e to see that your teacher is taking the time to look over the assignments that you spent your time on and individualizing your comments." Feedback is shaped by individual student assignments as a means of individualized instruction (Chang & Petersen, 2006). An additional difference is that professors allowed students to revise their work if the feedback was written on their assignments: "Also with handwritten feedback, most professors will allow you to fix the paper and resubmit it." The findings of the present study mirror Chang's study (2011) in that students felt making revisions to their assignments promoted their learning. Yet, the findings were incongruent with Dickinson's (1992) notion that handwritten feedback does not help students improve their performances. The respondents' expressions clearly indicated that they found handwritten feedback was advantageous to their learning and that they would rather take extra time decoding professors' handwriting than receive assignments without feedback. What also differed from the view of e-feedback supporters was that handwritten feedback supporters were able to physically touch the feedback, which they perceived had an effect on their learning: "I also like to be able to touch the actually feedback because for some reason I feel like I understand it better when I can touch it."

E. Personal.

Supporters of handwritten feedback seemed to tie the quality of feedback to personal attributes (32%) (see Figure 1). Handwritten feedback seemed to allow for establishing a closer rapport with instructors than e-feedback. Some students noted, "The feedback that is rece[i]ved from the instructor is more [personal] than the electronic issued feedback . . ." "[I]t makes the feedback feel more personal and shows an interest in all students, whereas electronic could be set up to give the same feedback to multiple people. . . It makes . . . me feel as if my professor really knows who I am." The findings were supported by the reports of Ferguson (2011) and Scott (2006), both of which found that some students still felt a strong dislike toward e-feedback. Asking professors questions in person, from the perspectives of the handwritten feedback supporters, was an avenue to establish a relationship with professors. In contrast, there was only 1% of e-feedback respondents (see Figure 1) making comments on the same topic. The comments principally pointed to e-feedback being impersonal: "It's more impersonal [than handwritten feedback]." " . . . sometimes electronic feedback feels generic and impersonal." ". . . When receiving all feedback from a computer, it becomes easy for the student to feel like a number." Scott (2006) had a similar concern and identified that e-communication lacked social interaction and personal touch.

An explanation of rating quality of feedback and personal by handwritten supporters as the first and second is that most of the respondents are Millennial Generation or Generation Y (59%), who were born between 1980-1999 and who may be extremely comfortable with technology and have no real memory of life without computers, cell phones, and digital music (Rockler-Gladen, 2006 in Chang, 2011). Therefore, typing is natural and ordinary. As such, the participants might answer the survey questions based on their past experiences. From their perspectives, if instructors were willing to sit down and write on students' submitted assignments, it shows that instructors would read their work carefully and give thoughts to students' work. This seems to imply, what was also highly valued by the handwritten supporters, which was the time spent by instructors reading their assignments and the time on writing feedback. That is, time spent by instructors writing by hand represented a level of care that

instructors had about them, as noted by a student, "It . . . shows that the professor actually cares about the student's work and doesn't just gloss over it . . ." The care given by professors who wrote feedback by hand also seemed encouraging; students felt a sense of obligation to read the feedback: "Handwritten feedback is something I usually feel more obligated to read as it is all on my returned assignments."

F. Longing for Feedback.

The last survey question, "Do you have any other comments to make about assessment feedback that may help faculty better facilitate your learning?" invited all respondents to respond, irrespective of handwritten feedback supporters or e-feedback supporters. The findings revealed that 57% of the responses were about the quality of feedback (see Figure 2). It is evident that the respondents generally were interested in receiving feedback in order to improve their learning. Some students commented, "I don't have a preference on electronic or handwritten, I just prefer to receive feedback." "Professors don't tend to give a lot of feedback so whatever we get is helpful." "I love timely feedback that is specific instead of just a general grade. I really want to know what I did great on and what I need to improve on and the reasons behind them." ". . . I like to see the RED ink on my page...there is always room for improvement." ". . . when it comes to engaging with comments or feedback, having a marked up paper with comments and input is the most helpful." This is consistent with Chang's (2011) findings that students expect to receive feedback that is useful, helpful, constructive, specific, detailed, in-depth, and thorough. The findings, however, differ from those by Winter and Dye (2004) that students were careless about feedback as they had no intention to pick up graded assignments with instructors' feedback. Discrepant with the present study's findings is also the notion by Wojtas (1998 in Higgins, Hartley, & Skelton, 2001) that students only glanced over their grades, but they did not read feedback. "Feedback in any form is greatly appreciated. . . [.] We do so many assignments in the School of Education and receive relatively small amounts of feedback from certain teachers. Not all of the teachers are lacking in the feedback department, but when being asked about which kind of feedback I prefer all I can think of is how much I would just like feedback regardless of the chosen delivery method." Students' strong desire for feedback also led them to offer suggestions: "I would appreciate all instructors familiarizing themselves with Oncourse, using it, and entering grades and communication in a timely and consistent manner." (Note, Oncourse is a course management system developed by Indiana University along with a few other major universities, which is similar to Blackboard).
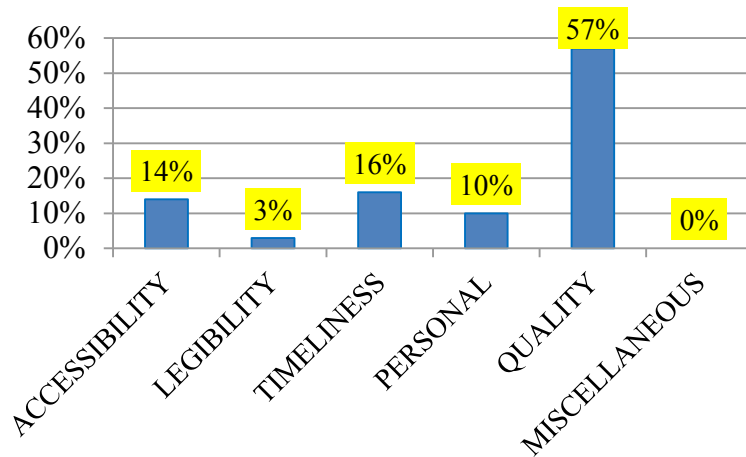
Figure 2. Qualitative responses to final open-ended question in light of six themes

All this data illuminates that there is extensive work to be done, which is in a sense concurred with Ferguson's (2011) and Price et al.'s (2010) assertion that feedback has not yet fully played its expected role in facilitating student learning. Feedback needs to be unambiguous and detailed enough for students to understand with ease. Instructors also need to write feedback in a way that learners are willing to act on and that shows instructors care about student learning. Taken into account that 57% of the comments were about quality of feedback and that timeliness was in the distance second (16%), these findings do confirm with Ferguson's (2011) report that if students expect to receive quality feedback, waiting a bit longer would not cause a huge issue. Even though there is a 41% difference between the quality of feedback (57%) and timeliness (16%), these two categories, being next to one another, are a good indication that students not only expect quality feedback, but also want it in a timely fashion in order to benefit their learning (Bai &Smith, 2010; Bridge & Appleyard, 2008; Chang, 2011; Denton et al., 2008; Price et al., 2010; Scott, 2006). The practices of the quick delivery of quality feedback with computer technology coupled with communication/dialogue between instructors and students have been termed as feed-forward (Duncan, 2007; Murtagh & Baker, 2009; Price et al., 2010). That is, feedback should not be seen as simply as justification for a given grade without an opportunity for students to use the information to better future work. The findings echo Hattie and Timperly's (2007) report that feedback is an assessment continuum between instructors and students where feedback and instruction are intertwined. Price et al. also supported that feedback was a component of an ongoing dialogue between the stakeholders. It becomes most effective when learners are able and willing to use it and when instructors provide information of "*how to improve*" subsequent learning (Ferguson, 2011).

G. Miscellaneous.

With respect to miscellaneous, there is a difference between handwritten feedback supporters and electronic feedback supporters. Handwritten feedback supporters did not make any comments at all under this theme, whereas the e-feedback supporters did (5%) (see Figure 1). Students rationalized three reasons for supporting e-feedback, including saving trees, having less paper to deal with, and potentiality of e-feedback. Some respondents noted, "[It] saves trees and money." "I … prefer to use as little paper as possible for environmental reasons." Some found it

Chang et al.

easier to receive e-feedback, because students would have "less paper to deal with." Chang's (2011) study supported these findings. Some respondents might not have direct experience of interacting with e-feedback, but imagined that the feedback could offer more to student learning, "I feel that electronic feedback has the potential to be more thoughtful as well."

H. Degree of Preferences.

Although the majority of students were interested in e-feedback, more respondents who preferred handwritten feedback (88%) favored the feedback to a moderate or large extent more so than those with a preference for e-feedback (81%) (see Figure 3).
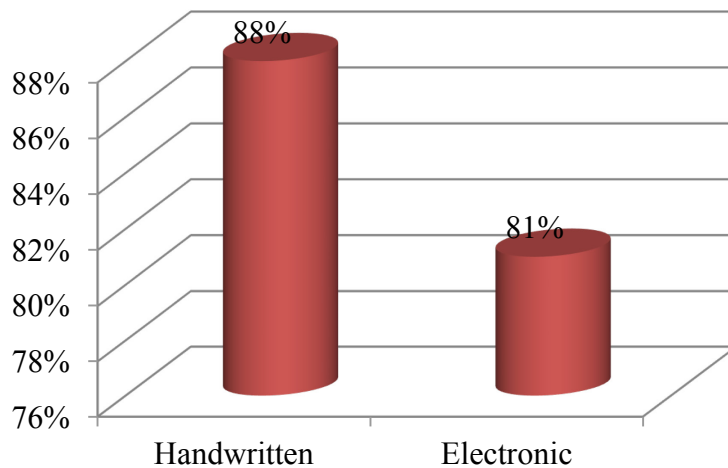
Figure 3. The degree of preferences for feedback

I. Usefulness to Learning.

The same pattern is observed when it comes to the usefulness of feedback to learning. Eleven percent more respondents were in favor of handwritten feedback (99%) than were in favor of e-feedback (88%). Students felt feedback was somewhat to very useful to their learning (see Figure 4).
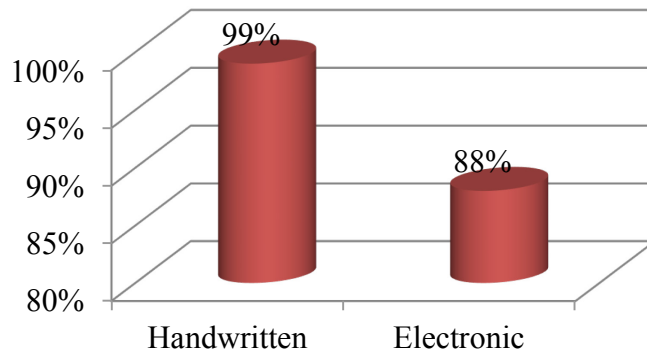
Chang et al.

Figure 4. The degree of usefulness of feedback

J. Gender, Age, Class Standing, GPA, and Major.

Table 5 reports the frequency analysis of gender, age, class standing, GPA, and major corresponding to handwritten feedback and e-feedback. There are twice as many female respondents and male respondents preferring electronic feedback than handwritten feedback. The same is true for majors. Except for juniors, twice as many seniors, freshmen, and sophomores preferred electronic feedback than handwritten feedback.

Table 5. Handwritten or electronic feedback data

Variables	Handwritten Feedback		Electronic Feedback		Total	
	n	%	*n*	%	*n*	%
Gender						
Female	62	0.3	138	0.69	200	100
Male	14	0.33	29	0.67	43	100
Age						
18-24	59	40.1	88	59.9	147	100
25-34	13	21.3	48	78.7	61	100
35-44	2	7.4	25	92.6	27	100
45-54	3	23.1	10	76.9	13	100
Class						
Freshman	13	27.7	34	72.3	47	100
Sophomore	19	32.8	39	67.2	58	100
Junior	24	41.4	34	58.6	58	100
Senior	23	28	59	72	82	100
GPA						

4.00-3.01	49	29.9	115	70.1	164	100
3.00-2.01	28	45.2	34	54.8	62	100
2.00-1.01	0	0	5	100	5	100
Major						
Elementary	51	30.9	114	69.1	165	100
Secondary	24	34.3	46	47.8	70	100
Special Education	4		10	71.4	14	100

Note. Percent ranges refer to the partitioned group or *n*.

A crosstabs procedure, using the Chi-square Test of Independence, revealed there were no statistically significant differences between the observed and expected frequencies on the variables of interest. The results failed to reveal a statistically significant difference in terms of gender, $\chi^2(1, 243) = 0.040$, $p=0.842$ between handwritten and electronic feedback. A crosstabs procedure, Chi-square Test of Independence, also failed to reveal a statistically significant difference $\chi^2(3, 245) = 3.335$, $p=0.343$ regarding class standing between handwritten and electronic feedback. Lastly, there was no statistically significant difference $\chi^2(6, 249) = 3.876$, $p=0.693$ among majors. This means that regardless of gender, class standing, or major, there was no preference between handwritten or electronic feedback. No other crosstabs procedures, using Chi-square Test of Independence, revealed any statistically significant differences in terms of gender, class standing, or major.

Yet, the Chi-square Test of Independence indicates a statistically significant difference, $\chi^2(3, 248) = 15.807$, $p=0.001$, among age group respondents. In the 35-44 age group, 93% preferred electronic feedback while only 60% of the 18-24 age group preferred electronic feedback (see Table 6).

Table 6. Age and feedback preferences

			Feedback		Total
			Handwritten	Electronic	
Age	18-24	Count	59	88	147.0
		Expected Count	45.6	101.4	147.0
		% within Age	40.1%	59.9%	100.0%
		% within Feedback	76.6%	51.5%	59.3%
		% of Total	23.8%	35.5%	59.3%
	25-34	Count	13	48	61.0
		Expected Count	18.9	42.1	61.0
		% within Age	21.3%	78.7%	100.0%
		% within Feedback	16.9%	28.1%	24.6%
		% of Total	5.2%	19.4%	24.6%
	35-44	Count	2	25	27.0
		Expected Count	8.4	18.6	27.0
		% within Age	7.4%	92.6%	100.0%
		% within Feedback	2.6%	14.6%	10.9%

		% of Total	0.8%	10.1%	10.9%
	45-54	Count	3	10	13.0
		Expected Count	4.0	9.0	13.0
		% within Age	23.1%	76.9%	100.0%
		% within Feedback	3.9%	5.8%	5.2%
		% of Total	1.2%	4.0%	5.2%
Total		Count	77	171	248.0
		Expected Count	77.0	171.0	248.0
		% within Age	31.0%	69.0%	100.0%
		% within Feedback	100.0%	100.0%	100.0%
		% of Total	31.0%	69.0%	100.0%

A Chi-square Test of Independence also revealed a statistically significant difference, $\chi^2(2, 248) = 7.284$, $p=0.026$, among GPA respondents. In the 2.00 or lower GPA group, 100% preferred electronic feedback while in the 3.00-2.01 only 54.8% preferred electronic feedback (see Table 7).

Table 7. GPA and feedback preferences

			Feedback		Total
			Handwritten		
GPA	3.01-4.00	Count	49	115	164
		Expected Count	54.7	109.3	164.0
		% within GPA	29.9%	70.1%	100.0%
		% within Feedback	63.6%	74.7%	71.0%
		% of Total	21.2%	49.8%	71.0%
	2.01-3.00	Count	28	34	62
		Expected Count	20.7	41.3	62.0
		% within GPA	45.2%	54.8%	100.0%
		% within Feedback	36.4%	22.1%	26.8%
		% of Total	12.1%	14.7%	26.8%
	1.01-2.00	Count	0	5	5
		Expected Count	1.7	3.3	5.0
		% within GPA	.0%	100.0%	100.0%
		% within Feedback	.0%	3.2%	2.2%
		% of Total	.0%	2.2%	2.2%
Total		Count	77	154	231
		Expected Count	77.0	154.0	231.0
		% within GPA	33.3%	66.7%	100.0%
		% within Feedback	100.0%	100.0%	100.0%
		% of Total	33.3%	66.7%	100.0%

Perhaps younger students still need quite a lot of encouragement and appropriate assistance from professors in order to increase their awareness of the importance of feedback in their learning and of how to act on it. With respect to the difference between students' preferences for either form of feedback and GPA, an explanation of this may be that the students in the mid-range might feel satisfied with their mediocre grades and thereby cease to make extra effort to achieve better grades. The findings are inconsistent with those by Chang (2011), as she did not find any statistically significant differences among preference of e-feedback, and age or GPA.

K. Limitations.

This study was only focused on the SOE undergraduate participants' perceptions of e-feedback and handwritten feedback. The data from this survey study were the respondents' subjective reports, which mostly rest on the respondents' mood, feelings, degree of carefulness and attentiveness in reading questions and writing answers, and the effect of the surroundings when the responses were being composed. It also depended on the various levels of experiences that the respondents had had with e-feedback and handwritten feedback. In addition, the responses might be affected by how the respondents understood a certain definition, such as that of e-feedback. In the survey, e-feedback was defined as feedback that is typed and delivered electronically to students via emails, forums, etc. Based on the responses received, this definition did not seem to suffice, as it resulted in various interpretations or misunderstandings: Some understood that e-grades were e-feedback. Some others referred it to general feedback received via email while some might think that e-feedback meant canned responses preset by professors or automatically generated by computers after an exam or a quiz was taken. Some interpretations could be that e-feedback was identical and sent to multiple students in the class using some application, e.g. Turnitin-GrademMark ®. Others might have defined feedback as detailed and individualized, especially tailored to each student's assignments. Furthermore, owing to these distinct variations, even though no responses were read indicating students had never received any feedback from faculty, the report issued by the National Union of Students (NUS) Survey (2008) that 85% of respondents did receive written comments could not be addressed. Perhaps those students excluded themselves from the survey altogether.

Nonetheless, the study provides preliminary insights into the preference of the form of feedback undergraduate students preferred and an explanation of why. The threshold will begin the path of continual investigation about how feedback is provided to better facilitate students' learning.

L. Educational Implications.

Even though nearly 70% of the SOE undergraduate participants claimed that they preferred e-feedback, the comments made by this group on the quality of feedback were not nearly equivalent to those by handwritten feedback supporters. In terms of the degree of preferences, there were fewer e-feedback supporters than handwritten supporters who felt that the feedback was somewhat to very useful. However, there were an alarming number of responses made by both of the groups on the quality of feedback, when they answered the last survey question: "Do you have any other comments to make about assessment feedback that may help faculty better facilitate your learning?" Many responses were of their longing for feedback, "I prefer feedback

in general which is greatly lacking in some classes." In light of this, it would be wise for instructors to take some action to offer feedback useful and beneficial to student learning. In addition, instructors need to enhance or strengthen their capabilities to provide feedback on students' assignments with computer technology, as we are in a technology era; technology is omnipresent. With computer technology, instructors are able to place comments on places where students are better able to determine where they need to revise and how their work can be improved. Typing on computers also allows for more words and clearer messages. Students want more specific and detailed feedback rather than a few brief notes on their assignments: "I think that feedback needs to be more specific and to the point. Not just a 'good job' or a check mark. I want to know what I did [well] and what I did wrong. I also think that the more detail the professor can give the better." "I feel that electronic feedback has the potential to be more thoughtful as well." Typing should eliminate illegible writing, thereby reducing unnecessary frustration.

Before writing feedback, instructors should read students' work carefully so that feedback is especially tailored to a student's learning level. Instructors also need to give feedback plenty of thought and try to find out, by trial and error, how to provide constructive, thorough, specific, clear, unambiguous, and friendly feedback so that students are encouraged to read and act on it for the amelioration of their performances. With computer technology, instructors may also consider writing a general summary at the end of a paper or exam in addition to specific feedback.

In providing feedback on students' assignments, instructors also need to bear in mind that they ought to make every effort to steer clear of e-feedback that has potential to be misconstrued by students, as a student commented, "I think that miscommunications can often happen with electronic feedback that can cause rifts in the teacher/student communication." Even though some professors still intend to maintain writing feedback by hand, they also need to keep in mind to consistently offer quality feedback, as pointed out by a student: "However, handwritten feedback does not always equal quality in terms of being helpful and constructive." By and large, students, irrespective of e-feedback or handwritten feedback supporters, yearn for useful and helpful feedback. Yet this study demonstrates that providing quality feedback has not been a widely acceptable practice, thereby a need for effective faculty training to facilitate students' learning with quality feedback feed-forward.

To affect student learning, instructors should pay particular attention to those in the 18-24 age category and with those whose GPA falls 2.01-3.00. Particular attention to "double dip" students, those who are young and have an average GPA, should prove especially beneficial.

M. Suggestions for future research.

Future research may involve the replication and expansion of the present study and examine preferences of undergraduate students and graduate students alike. Since the issue of feedback being personal seemed to surface as one of the principal reasons behind students' preference, research questions could also include: "How could instructors compose e-feedback that is personal and appreciative?" Students expressed frustration and disappointment when feedback is too unclear or brief to help their future learning and the findings seem to have indicated that more feedback is better. One student remarked, "Professors tend to give more comments when feedback is given electronically." Future research could delve deeper into how much feedback is enough for students to feel a benefit. Information overload can easily discourage students to

enhance learning, as a student pointed out, "Ridiculously little font sizes are almost as annoying as bad handwriting and information saturation leads to the type of visual clutter that frustrates me as I look for the spec[i]fic area I need." On the other hand, students wanted specific and detailed feedback: "On the feedback please be specific and tell us how we should have answered." "[M]ore detail makes things much more clear." Research focus could also be placed on what an explicit definition of e-feedback is and how to feed-forward so that students are helped to genuinely gain knowledge and skills.

N. Conclusion.

The vast majority of SOE undergraduate participants preferred feedback that is sent to them electronically because this form of feedback was said to be easy to access, considering many students have cell phones, laptop computers, and other mobile devices. Feedback sent to them electronically is faster than handwritten feedback returned back to them during face-to-face meetings. Typed feedback is more readable than most handwritten feedback. Although the groups did not virtually provide an equal number of comments on the quality of feedback, both clearly indicated that undergraduate students in general not only welcomed but also wanted feedback that is detailed, tailored, specific, in-depth, and thorough. Timeliness was an additional reason for undergraduates supporting e-feedback. Even though there was a polarized view on feedback being personal between the two groups, a close rapport with instructors was what most students would appreciate. The students also urged instructors to familiarize themselves with technology in order to efficiently provide them with helpful feedback. When working with students who are at ages 18-24 and whose GPA is between 2.01 and 3.00, instructors should make the effort to encourage these students to use feedback to advance their learning.

Chang et al.

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