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#LivetweetMyLecture: A Look at Note-taking Consolidation, Retention, and Test Performance in Students Using Twitter vs. Traditional Typed Notes

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#LivetweetMyLecture: A Look at Note-taking Consolidation, Retention, and Test Performance in Students Using Twitter vs. Traditional Typed Notes

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ABSTRACT

This study investigated how different types of note-taking affect college students' retention of classroom material. In particular, this study looked at whether live-tweeting lecture material would result in better retention of the material presented in a lecture than traditional note-taking on a laptop. It was hypothesized that students who took notes via live-tweeting would have comparable results to those who took notes in the traditional computer format. In addition, it was also hypothesized that a person's familiarity with Twitter would likely affect his or her ability to use Twitter as an educational tool. In order to test this hypothesis, participants watched a portion of a video of a college lecture in one of two conditions. Half of the participants took notes in the traditional computer format, and half of the participants took notes through the use of live-tweeting of the lecture material. After the video lecture, students received a distractor test (arithmetic problems), and completed both a quiz over the material, as well as a self-report measure about how accurately the participant followed the experimenter's instructions. The results indicated that live-tweeting led to poorer quiz performance than standard note-taking. In addition, it was discovered that a person's familiarity with Twitter did increase their scores in the Twitter trial and that the amount of tweets or notes recorded may have had an impact on students' quiz performance.

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Professors often complain that their students are distracted by the use of social media. Rather than making the task at hand the main focus, students often "listen" to the lecture and maybe even jot down a few basic notes as they scroll through their Pinterest boards, Facebook timelines, and Twitter feeds. For many students, the idea of focusing on one thing at a time and consolidating information into smaller pieces for the sake of learning seems anachronistic. Instead, students, in many cases, choose to take notes verbatim from PowerPoint slides and other lecture materials, failing to realize all of the studies which promote consolidation of information and discussion as a means of mastery of course content. As such, the purpose of the present experiment was to determine, experimentally, whether using social media (specifically Twitter) to consolidate the topics discussed in a course lecture increases or decreases subsequent retention of that information.

Considering that the present study involves learning and taking notes in a natural class environment, it makes sense that the concepts of divided attention and dual-task performance would be a factor in this experiment. In one study on this topic, Pashler and Johnston (1998) argue that the ideas of attentional limitations are largely affected by the types of tasks being performed and have two main criteria for a performance limitation to be described as attentional. They first suggest that the limitation cannot be a consequence of human/sensory structure, which is why combined actions such as not being able to type and hold a drink in one's hand could not be defined as an attentional deficiency. Secondly, they claim that the inability to perform two tasks dually can only

be defined as attentional if the person could perform the task alone to that standard in the same conditions. Thus, a person not being able to comprehend two people speaking at the same time would be defined as attentional, but trying to read overlapping text would be more of a physical limitation**.**

Pashler and Johnston (1998) support part of their argument with the cognitive bottleneck theory, claiming that certain critical mental operations from each task might arise at the same time and that one must give a certain task priority. They also cite the crosstalk theory, which claims that even when there is adequate processing ability for multiple tasks, keeping those streams of thought separate can cause interference if the task is too similar**.** In other words, according to these ideas, it seems possible that the use of social media in the classroom might work to direct attention away from a course lecture and contribute to a decrease in the retention of lecture content.

In regards to central processing limitations, Pashler and Johnston (1998) suggest that experimental methods are needed that do not overload the perceptual limitations or that the experimenter should choose different input modalities for the task. They additionally note that in their lab, they have observed that people can perform two continuous tasks with only slight loss in performance if the tasks do not have conflicting input and output modalities. One such example they cite is a study by Spelke, Hirst, and Neisser (1976), who trained participants to take dictation (speech input and manual output) while reading aloud (visual and vocal output) and only saw somewhat higher error rates.

This work by Pashler and colleagues holds relevance to the present study for a wide variety of reasons. For example, regardless of whether the student is in the note-

taking trial or the Twitter trial of the present study, he or she is required to perform multiple tasks at once (e.g. take notes via Twitter or Google Documents and pay attention to a video lecture). The Twitter trial easily has the potential to lead to additional attentional deficiency; however, such a possibility also exists for those participants assigned to the 'traditional' note-taking condition because a computer / keyboard interface will be used in both conditions. The question thus becomes, "What is second nature to the participant?" Because familiarity with technology might facilitate the ease with which social media could be coopted to enhance learning, it was hypothesized that students in the Twitter trial who had familiarity with Twitter would perform better than students in the same condition without prior Twitter experience. In regards to central processing limitations, using Twitter (like the typed notes) can be viewed as a visual or manual input and the lecture as speech input. Thus, it was hypothesized that the Twitter users could have results comparable to traditional note-takers, since many students have allowed Twitter to become part of their daily routine.

In another related study, Voss, Baym, and Paller (2008) found that recognition accuracy increased when encoding occurred under divided attention and the testing format was a forced-choice recognition test. Utilizing kaleidoscope stimuli in their experiments, Voss et al. sought to determine whether recognition accuracy was influenced in conditions in which participants' attention was divided. In Experiment 1, the experimenters used eighty kaleidoscope images and divided them into similar pairs to test participants' recognition memory of the kaleidoscope stimuli in one of two encoding conditions, full-attention or divided-attention. The primary task, observing kaleidoscope stimuli, was a visual task, and the other task, recoding odd or even numbers, was a

manual task. The results indicated that memory was significantly improved when divided-attention encoding manipulation was used. In Experiment 2, the procedure was similar, only participants were asked to report recognition confidence after each trial. Through this, the experimenters found that participants had lower confidence in their answers when in a divided-attention condition.

Voss, Baym, and Paller (2008) suggest that, overall, explicit memory may be reduced by divided attention but that implicit memory may be unaffected or only mildly reduced. Since the present experiment is a test of explicit memory, one might expect any effects of divided attention on performance to be detrimental. Voss et al.'s utilization of forced-choice recognition format, however, is the primary reason that we adopted a forced-choice test in the current study. Experiment 2 of Voss et al.'s study, in particular, is relevant to the present study because it highlights the lower levels of confidence reported by participants in a divided-attention condition. Since participants recognize social media as a form of divided attention, they may not feel as confident in their method of note-taking or in their answers, which could have an effect on their memory performance.

Spataro et al. (2013) similarly found divided attention to have some positive effects on memory. In particular, they demonstrated that, in regards to implicit memory at least, divided attention can enhance memory encoding. In their first experiment, the experimenters attempted to reproduce the attentional boost effect through a recognition test (explicit memory) similar to Swallow and Jiang (2010)'s study, but they used words instead of images. The thirty-six participants were given words to study from the LexVar, a lexical database from which the experimenters selected words that were seven

to nine letters in length. In the divided attention condition, participants were asked to study and read each word aloud while monitoring the color of a small circle directly below the word. When they saw a red circle instead of a green one below the word, they were instructed to press the spacebar. The data indicated that working in the divided attention condition provided an attentional boost. Additionally, in the divided attention condition, accuracy was found to be greater for target words than the distractor words, whereas the fixed attention trial had no difference in the target and distractor word accuracy. In their second experiment, Spataro et al. (2013) used a similar experimental format but examined the attentional boost effect with a lexical decision task. In doing this, they found an absolute attentional boost effect, which occurred when the target was defined by the combination of the lexical and color features. This result aligns to Swallow and Jiang's (2010) idea that attentional orienting facilitates perceptual encoding. Using a different implicit task, the Experiment 3 results reflected the findings of Experiment 2. Finally, a fourth experiment tested Swallow and Jiang's (2010) idea of an attentional boost effect due to enhanced perceptual encoding by using a conceptual implicit test. The results of this experiment yielded findings consistent with Vaidya et al. (1997), in that there were no significant divided attention effects.

If divided attention during encoding can indeed enhance memory, as these studies suggest, it is possible that distractions in the classroom could actually improve rather than inhibit retention for the presented information. In other words, it emphasizes the fact that while recognition memory can suffer from the negative effects of dual-task processing, it can also benefit through the enhanced perceptual analysis. Spataro et al.'s (2013) study also reflects an attentional boost in regard to implicit memory rather than explicit

memory, which is what most classroom exams (and as a result, the current study) are focused on. With this in mind, it was hypothesized that participants in the Twitter condition would perform similarly to participants in the note-taking condition.

An even older debate than social media in the classroom is the debate concerning whether general technology used in classroom situations is beneficial or not. Bui, Myerson, and Hale (2013) reexamined this debate. Bui et al. (2013) performed three main experiments. In the first experiment, they had eighty undergraduate students listen to an 11-minute lecture with which they were unfamiliar. Some students were asked to organize their notes, whereas others were asked to take transcription-style notes. They were also asked either to take notes either by hand or by typing the content of the lecture. The participants were then tested using both a free-recall test and a short-answer test, which were scored by blind graders. The results indicated that the participants recorded more notes via typing than by hand, and transcription notes via computer led to better performance on the short-answer and free recall tests than did handwritten notes. Experiment 2, an all-computer experiment, yielded similar results in regards to transcription testing. In an immediate recall test (similar to the one used in the present study), the participants had greater performance when using a transcription method. Bui et al.'s final experiment examined note quality versus quantity when students were given the opportunity to study their notes, and the results indicated that the transcription method was easier to study than other methods.

For several reasons, Bui et al. (2013)'s results are directly applicable to the present study. Experiment 1 provides evidence in favor of the idea that a modern approach to note-taking can have positive effects, since typing notes (once considered not

as effective) actually proved more effective than handwritten notes. Second, ninety-six percent of the college students in the study claimed to be proficient typists, which the experimenters argue is a large factor in the students' success in the typing trials. Thus, it would be a logical step to hypothesize that students who are more familiar with Twitter would perform better in the Twitter condition than students who are not Twitter users. The study additionally supports the present study's second hypothesis, that the quantity of notes recorded can increase performance, particularly if the student is tested immediately after the lecture. Most importantly, the results of Bui et al.'s first experiment support the main hypothesis because live-tweeting often uses transcription elements. Additionally, Experiment 3 further illustrates the benefits of transcription methods, a large component of live-tweeting. After considering the results of these three experiments, we chose to use an immediate recognition test of the studied material and refrained from testing memory performance in students who used handwritten notes.

Of course, neither technology use nor social media use is limited to a computer; thus, it also seems important to review the literature as it pertains to mobile phone usage. In one such example, Gingerich and Lineweaver (2014) conducted two studies whose results indicated that texting in class does indeed affect memory performance. In their first experiment, half of their participants were in a texting condition, and the other half did not use mobile devices. The students in the texting condition were provided with the name of another student at random to text scripted messages to throughout the experiment. All participants were asked to listen to a brief lecture on time-management and divided attention, which could be considered priming. After a five-to-seven-minute delay, participants were asked to take a forced-choice quiz and give their prediction of

how many questions they had answered correctly. Participants in the texting condition answered fewer questions correctly than those in the non-texting condition, and participants in the texting condition as a whole did not believe that they answered as many questions correctly. This indicates their attitudes towards texting in class and that they themselves see text-messaging in class as a distraction.

Experiment 2 followed a similar procedure. Participants were again divided into a texting or non-texting group. They were told, however, that they were participating in one of three conditions: students who did not use mobile phones, students who texted other students about lecture content and students who texted irrelevant material. No students were actually assigned to a condition where students texted relevant class material. Participants were asked to take notes on lecture material, and those in the texting condition were given a participant to text throughout the lecture. Before commencing the lecture and again after the lecture, students were also asked to predict their performance on the quiz. After a distractor test of watching and rating the emotions of an episode of *Spongebob Squarepants*, participants completed a forced-choice quiz. From this, it was further gathered that students who text-message during class will have impaired comprehension and retention. As in Experiment 1, students in the texting condition predicted that their scores would be low.

The work of Gingerich and Lineweaver (2014) is relevant to the present study for two reasons. First, it indicates the attitude with which students regard potentially-distracting technology. More importantly, however, it raises the question of whether it is the technology itself or the divided attention that may result from technology that is the greater issue. In the case of Gingerich and Lineweaver (2014)'s study, students were

asked to text material that was irrelevant, so it would make sense that the concept of divided attention would be a factor. It is for this reason that participants in the present study were asked to live-tweet lecture content rather than simply tweet irrelevant material.

Another potentially important factor to consider is whether perceptions of the material being taught may have an impact on student performance. Austin et al. (2004) studied how guided notes, slides, and traditional notes impact note quality. In their experiment, they had 23 undergraduates in an applied psychology class consent to have information collected from their notes as part of the study. Three conditions of student note-taking were used: traditional lecture, where the instructor did not provide slides or supplemental material; slides condition, where the instructor used PowerPoint slides throughout the lecture; and guided slide handouts, where the students received slides that needed materials to be filled in. The research assistants gave lectures on 'critical points' in material that had not been discussed in previous lectures. Student notes were scored based on their inclusion of these critical points.

The results of Austin et al.'s (2004) study indicated that the students who had guided slides recorded more critical points in their notes than did students who were only given slides or a traditional lecture without supplemental materials. This result indicates that guidance of what may be considered important material may assist the students in note-taking quality. Given this result, it is possible that seeing what other students deem important may assist students in taking better notes themselves, which indirectly gives support to the idea that the participants in the Twitter trial might perform especially well on any subsequent tests. However if the participants using Twitter are not on task or do

not have a grasp of important aspects of the material, it could have a negative effect on the Twitter users' subsequent test scores. Since instructor-guided notes proved to be of assistance in Austin et al. (2004)'s study, information regarding the relative importance of certain facts was not provided by the experimenter during the course of the current study.

Because Twitter is often used as an online discussion forum, it is understandable that professors would consider its use as a way to facilitate discussion in a large lecture-style class. One such example is Dr. Monica Rankin, who performed an experiment on this topic at the University of Texas- Dallas in 2009. Dr. Rankin, a history professor, implemented this study in her basic U.S. History course in the Spring 2009 semester in hopes of finding a way that students could integrate technology into discussions about course content. Much like introductory psychology classes at Ole Miss, it was a standard class that met for 50 minutes per class period, three times a week, and had about ninety students.

Lacking familiarity with Twitter herself, Dr. Rankin enlisted the help of Kim Smith, a graduate student in the UT Dallas Emerging Media and Communications program. Through her work with Kim Smith, Dr. Rankin established a classroom format and appropriate curriculum in which she could implement Twitter usage. She first created a lecturer Twitter account, @ushistoryII, then encouraged students in the class to create an account themselves and follow her. In her Monday and Wednesday lectures, she would lead the class with a traditional lecture style, but in her Friday class, she would lead the class with Twitter discussions.

In her faculty blog, Dr. Rankin explains that while it did sometimes cause some distractions and was a hassle to those at first who did not use Twitter, she also saw an increase in classroom participation and a new stream of ideas brought up that likely would not have been discussed otherwise (UTDallas.edu). This supports past research suggesting, that engagement in the material results in better retention even as much as 24 hours later (Dunlosky, Rawson, Marsh, Mitchell, & Willingham, 2013). Additionally, Dr. Rankin mentions that she had a tendency to process information more structurally and that it therefore bothered her when new ideas were introduced while other ideas still had not been completely covered. She also noted, however, that many of her students "…(in their world of intense multi-tasking) seemed completely capable of following several streams of thought at one time." This conclusion lends itself to the idea that the divided attention, which often accompanies social media and is met with contempt by professors, might not have quite the detrimental effects predicted.

After considering Dr. Rankin's observations, we decided to run a partial replication and extension with several important modifications to the research design. Like Dr. Rankin, we wanted to use Twitter as a way to facilitate discussion and as a method of staying on-task. In the present study, however, we were more concerned with allowing students to facilitate their own discussion, rather than using Twitter as a method for the teacher to facilitate discussion with students. Another relevant factor was the familiarity with Twitter as a form of social media. While many of Dr. Rankin's students were unfamiliar with Twitter and Tweetdeck, that lack of familiarity has likely faded dramatically over the last five years. As a result, we provided the computers used in the present study and used the online Twitter website rather than a mobile phone application.

In doing so, we ensured that a difference between mobile phone Twitter users and computer Twitter users would not be an issue.

In short, participants in the present study watched a college lecture on ethical behavior while taking notes in one of two ways. In one condition, students were asked to live-tweet the lecture as it unfolded. This involved potential discussion of the lecture topics in addition to commenting on tweets produced by other students. In other condition, participants were asked to use a standard note-taking procedure in which they were asked to type their notes into a Google document. The primary purpose of the experiment was to determine whether live-tweeting the class improved or hindered performance. Secondary purposes included determining if Twitter familiarity indicated higher scores among participants in the Twitter condition and if the amount of material recorded in the style of note-taking positively correlated with quiz performance.

Method

Participants

Sixty-eight undergraduate psychology students at the University of Mississippi participated in fulfillment of partial course requirements. Thirty-two of these participants were in the standard note-taking condition, and 36 students were randomly assigned to the Twitter trials.

Design

The experiment utilized a between-subjects design, in which each group was assigned a specific style of note-taking—live-tweeting or traditional typed notes. The independent variable was the style of note-taking used (Twitter or traditional typed notes), and the dependent variable was the test scores produced as a function of the note-taking style employed.

Procedure

Participants were recruited using the SONA system and were informed that they would be participating in a study examining the use of Twitter in a college classroom. Prior to the participants' arrival, the experimenter logged each computer into one of fifteen Twitter accounts or Google Documents for the participants to use to take notes. As each participant arrived, the experimenter instructed the student to select a computer to use during the experiment. By not instructing the student to select a specific computer, this added a level of anonymity to the experimental design. Once every participant had arrived for the session, the experimenter went through the procedure and gave each participant an informed consent form, which they were told to read and sign before beginning the experiment. The experimenter additionally reminded them that their

answers would remain confidential and showed them how their identifying information was separated from the additional materials.

Following this, the participants were asked to watch a twenty-minute video lecture and take notes using the method that was assigned to them. Neither group was asked to refrain from recording extraneous material or instructed to stay on-task, as to preserve a natural classroom environment. Their only restriction was that they could not be logged back into the study account if they chose to logout. After watching the video and taking notes using one of the two types of methods, participants were then asked to perform a distraction exercise of multiplication problems. Following this, they completed a multiple-choice quiz regarding lecture material (see Appendix A). Finally, they completed a mostly Likert-style survey concerning their attitudes and behaviors towards the lecture and style of note-taking used (see Appendix B). After completing the experiment, the participants were given an oral debriefing and received credit for their participation.

Once all the information had been collected, it was put in a folder separate from the informed consent papers and placed under lock and key to ensure further anonymity and confidentiality. Screenshots of the participant's tweets were saved in multiple folders of the experimenter's computers so that the Twitter accounts could be cleared and reset between trials. The completed note-taking trials, saved on Google Documents, were password-protected by the experimenter so that future participants could not access the other files.

Results and Discussion

The primary purpose of the present experiment was to determine whether taking notes via Twitter leads to test performance comparable to participants who use a more traditional note-taking technique. In the experiment, participants watched an interactive lecture on ethics. Half of the participants in this study typed notes into a Google Document while watching the lecture, whereas the other half of the participants were asked to live tweet their thoughts on the lecture and relevant material. Following this, participants were given a distractor test of arithmetic problems, a quiz on the lecture material [test – see Appendix A], and a survey [test – see Appendix B]. Some studies have suggested that divided attention during lectures impairs subsequent performance. Other studies, however, have suggested that condensing one's thoughts concerning a topic of study can improve encoding relative to other techniques. Thus, while there was the realization that students might become distracted through the use of social media, there was also a realization that a student could also be distracted through recording notes electronically and that a natural classroom environment would not control for that.

The results of the experiment indicated that participants in the traditional note-taking condition (M = 56.88%) obtained higher scores on the forced choice recognition test than participants in the Twitter condition (M = 47.96%). An independent samples t-test indicated that this difference between groups was statistically significant, t (66) = 2.20, $p < .05$. These results suggest that the test was detail-oriented and quite difficult for participants, particularly Twitter users who were focused on multiple tasks. One caveat to this is that the highest overall score, 86.67%, was from a participant in the Twitter condition. Thus, it might be the manner in which Twitter is used that influences scores.

It is possible that some participants chose to get off-task or to tweet irrelevant material, which could hinder scores.

Another hypothesis was that Twitter users would perform better on the recognition test in the Twitter condition than participants that do not regularly use Twitter. Approximately half of the participants in the Twitter condition (n = 21) were regular Twitter users while about half were not (n = 15). An independent samples t-test was run to determine whether or not performance on the recognition test differed as a function of regular Twitter use outside of the experiment. The results indicated that regular Twitter users performed better on the test (M = 52.38%) than non-Twitter users (M = 41.78%). This difference was marginally statistically significant, t (34) = - 1.90, p = .06, indicating that familiarity with Twitter affected performance in the Twitter condition. Further evidence for this claim was found when the results of the recognition test for Twitter users in the Twitter condition (M = 52.38) was compared with traditional note-takers (M = 56.88). An independent samples t-test indicated that this difference was not statistically significant, t (51) = .98, p > .05.

Finally, a bivariate correlation was run to determine whether there was a relationship between the number of words participants typed and their score on the recognition test. This relationship was statistically significant, r (30) = .45, p < .01 for those in the note-taking condition. For the Twitter condition, the results were not statistically significant r(34) = .16, p < .01, which further indicates that distractibility may play a role when using Twitter as a form of note-taking. This leaves the question of whether distractibility is the only factor in lower performance.

Overall, the results of the present study suggest that the success of Twitter in the classroom largely depends on the individual student. The results indicate that students who have greater familiarity with Twitter are more likely to have success than those with limited familiarity. In the present experiment, students were tested using computers; however, the results might differ if the students were to take notes via mobile devices, since their familiarity with the mobile device and their typing capacity on a smaller device would potentially be limited. Since distractibility is also a potential issue with students using social media in the classroom, future experimenters could also research how the microblogging discussion factor of social media impacts student performance, Future experimenters, for example, might choose to test student performance by having participants microblog using a software program or within online systems such as Blackboard to take away the social element.

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Table 1: Proportion correct as a function of note-taking condition

Condition	N	Mean % Correct	Std. Deviation
Notes	32	56.88%	2.87
Twitter	36	47.96%	2.85

Table 2: Proportion correct as a function of Twitter use

Condition	N	Mean % Correct	Std. Deviation
Twitter (non-user)	15	41.78%	16.42
Twitter (regular user)	16	52.38%	16.50
Notes	32	56.88%	2.87

Table 3: Correlations between length of notes, number of tweets, and quiz score

		Correct	Words	Tweets
Correct	Pearson Correlation	1	.450**	.160
Words	Pearson Correlation	.450**	1	.[b]
Tweets	Pearson Correlation	.160	.[b]	1

**. Correlation is significant at the .01 level (2-tailed).

APPENDIX A: Experiment Quiz

1. Which of the following questions is not a question that is necessary to understand Immanuel Kant's moral theory?
    a. How are categorical imperatives and morality possible?
    b. How can autonomy and deception coexist?
    c. How can duty and autonomy go together?
    d. How many moral laws are there?
2. According to Kant, a person only acts autonomously when _____
    a. Acting out of circumstance and not out of duty
    b. Acting out of desire
    c. Acting out of duty and not out of circumstances
    d. Acting out of personal gain
3. According to Kant, there is a gap between _____ and _____.
    a. Morality and scientific rationale
    b. The truth and an outright lie
    c. What we do and what we ought to do
    d. What we think and what we say
4. According to Kant, morality is
    a. Able to and often coexists with rationale and science
    b. Not something that can be delivered through science
    c. Something that can be governed by science
    d. None of the above
5. To test Kant's moral theory, Dr. Sandel uses which of the following scenarios?
    a. Killing someone in self-defense
    b. A student who has cheated on an exam
    c. A person who can be sacrificed to save others
    d. A murderer at the door
6. Which French philosopher did not agree with Kant's theory and uses a scenario in the above question to challenge it?
    a. Abbé Prévost
    b. Benjamin Constant
    c. Oscar Maloux
    d. Victor Lentant
7. Lying, according to Kant, is considered wrong because it is at odds with
    a. Autonomy
    b. Categorical imperative
    c. Duty
    d. Human nature
8. Kant says that he belongs to
    a. The intelligible world, where the person rules himself by his own moral laws
    b. The sensible world, where actions are determined by the laws of nature/cause and effect

c. Both a and b
d. Neither a nor b

9. According to Kant, morality is based on
    a. Background
    b. Consequences
    c. Formal adherence to the moral law
    d. Selective adherence to the moral law
10. Dr. Sandel uses the example of receiving a gift that you do not like to illustrate what is and is not an evasive truth. Which of his following responses is not considered an evasive truth?
    a. "I have never seen a tie like that before!"
    b. "Thank you; it's beautiful."
    c. "You shouldn't have!"
    d. All are considered evasive truths.
11. What was the argument that the lawyer used to argue that Bill Clinton was not lying but simply avoiding the truth?
    a. Former President Clinton did not see the relations as sexual.
    b. He believed that the definition of smoking had to include inhalation.
    c. He did not think the relations were inappropriate.
    d. When he said "that woman," he was referring to Hillary.
12. Kant believes that avoiding the truth and telling a lie are morally different even if they achieve the same result because:
    a. Avoiding the truth respects the categorical imperative.
    b. He believes that while is more wrong than the other, both are still wrong.
    c. He does not believe they are morally different.
    d. Lying is not encompassed in the universal moral law.
13. A moral law is contingent upon social conditions.
    a. True
    b. False
14. Kant believes that the number of existing moral laws is:
    a. Zero
    b. One
    c. Two
    d. Unlimited
15. Kant believes which of the following has no moral worth?
    a. Doing something good because of your own circumstances (i.e. being in a good mood)
    b. Doing something good for someone for your own benefit
    c. Doing something good has moral worth regardless of intentions.
    d. Doing something harmful to someone with good intentions

APPENDIX B: Experiment Survey

Please answer the following questions below related to your general use of Twitter and intake of classroom information.

1. I use Twitter on a daily basis.
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

2. I remember tweets that people post when said tweets are funny or insightful.
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

3. Prior to this study, I had used a Twitter account to create, retweet, or favorite a tweet.
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

4. I use a computer, netbook, iPad, tablet, or laptop to take notes for at least one of my lecture classes.
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

5. How often do you use Twitter as a form of social media?
1-2 days per week 3-5 days per week 6-7 days per week I am not a Twitter user.

6. How often do you use Twitter as an academic tool?
0 days/week 1-2 days per week 3-5 days per week 6-7 days per week I am not a Twitter user.

7. I consolidated information from the lecture into smaller amounts of material.
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree

8. I was off-task at certain points of the trial because I engaged in the following activities (circle all that apply):
Checked Email
Checked Twitter
Checked Facebook or other social media website
Surfed the internet or did online shopping
Other (please specify):
I did not get off-task.

9. I believe that I will use the style of note-taking that I used in this experiment for current or future classes.
Strongly Disagree 1 2 3 4 5 6 7 Strongly Agree