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"What Did I Miss?": Helping Students Recover Information Using Webcasts

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Abstract

Public schools have searched for effective ways to help students recover missed information following absences and prepare students for exams. Webcasts may be an effective solution. Webcasts containing classroom notes, video clips, websites, and audio recordings have been successfully used in many universities across the nation. This study demonstrated webcasts can also be successfully used to help students recover and review classroom information in a junior high school with a high population of low income students. During a ninth-grade Western Civilizations course, 12 webcasts of lectures were provided for student use. A survey showed students had a positive perception of webcasts and over half the students watched at least one webcast to recover missed notes or study for the exam.

"What Did I Miss?": Helping Students Recover Information Using Webcasts

In the limited time between classes, students who have previously missed class will often ask their teachers a question similar to this: "What did I miss when I was gone?" Time constraints prevent most teachers from effectively conveying the significance of their lessons and related classroom assignments, and often times the students are simply given a handout or told to copy a peer's notes.

As a history teacher in an urban junior high school, the author has tried to keep lessons visual in an attempt to improve student recall. In his dual-coding model of learning, Paivio (1979) contended students have the ability to store information in long-term memory in two relatively independent manners: logogens and imagens. Logogens include verbal and written information, and imagens are nonverbal images. However, logogens and imagens are not necessarily stored separately in the brain. Because logogens and imagens can be linked, a word may help a student recall a picture, and a picture can help recall a word. For example, hearing the word *playground* may invoke images of green grass and slides. Paivio suggests when a student is shown a picture while hearing information regarding it, concepts can be processed simultaneously as a logogen and as an imagen. By storing information both ways, students have more cognitive paths through which information can later be retrieved, thus improving recall (Najjar, 1995).

The author has found one way to combine logogens with imagens in his classroom is to use the Microsoft program PowerPoint. PowerPoint has the ability to project text and images simultaneously for students to view. Thus, as the teacher and students discuss information, student recall may increase through dual-coding techniques (Paivio, 1979). However, it is difficult for educators to create dual-coding for students

who are absent from class or who are preparing for an exam. Teachers can print handouts of PowerPoint presentations for students who have been absent, yet these handouts often lack many of the logogens and imagens presented in class such as expanded explanations of material, video clips, drawings on the board, and websites. Webcasts have the ability to better recreate the classroom experience for students by containing more of the logogens and imagens presented in class and thus improve student recall.

Webcast is a term combining *world wide web* with *broadcast*. Similar to *webcast*, *podcast* is a term combining the words *broadcast* and the portable media player *iPod*, Apple's MP3 and MP4 players (Copley, 2007). MP3 players have the ability to play audio files and MP4 players can play both audio and video files. In comparison to webcasts, podcasts have the added benefit of being "automatically downloaded to your computer's media player" (Flanagan & Calandra, 2005, p. 20). For the purpose of this study any video posted by educators to be viewed by students on either a personal computer or a portable media player will be referred to as a *webcast* and any portable media player with video capabilities will be referred to as an *MP4 player*.

Educators can create video webcasts of classroom lectures, which are then made available for students to view or download on personal computers or MP4 players. Unlike reading a handout of a PowerPoint presentation or copying peer notes which may lack much of the information and images presented originally in class, students can regain missed information and prepare for exams using webcasts. Universities across America have already made professors' lectures available as webcasts for students to view (Copley, 2007). By implementing webcasts, public school educators could join these

professors and answer the question, "What did I miss when I was gone?" by responding, "Watch the webcast."

Literature Review

No published studies focusing on the effects of webcasts containing recorded lectures in a secondary public school setting were found. Instead, several studies, including Bacro (2007), Baker, Harrison, Thornton, and Yates (2007), Brittain, Glowacki, Ittersum, and Johnson (2006), Copley (2007), and Shapiro, Mentch, and Kubit (2007) have focused on the effects of webcasts in universities including undergraduate and graduate students' usage and perceptions of webcasts.

Copley (2007) created audio and video webcasts of lectures during marine biology courses. Following the courses, an online blind survey was made available to participants (N=283) and had a response rate of 30% (n=84). The survey found 57% of respondents had downloaded an audio webcast while 61% had downloaded a video webcast. Using a five-point Likert scale (1=useless and 5=very useful) to compare webcasts to traditional paper handouts, respondents rated audio webcasts at 4.4 and video webcasts at 4.7. The most common reason given for downloading a webcasts was "for revision/preparation for assessments" (p. 391). Researchers also found 93% of respondents would like more webcasts to be made available and 57% indicated webcasts did not reduce their class attendance.

Brittain et al. (2006) reported similar findings concerning students' perceptions of webcasts. Webcasts containing lectures were made available to 105 students enrolled in a microbiology course at the University of Michigan. A survey, with a respondent rate of nearly 67% (n=70), was given to participating students and found 73% of the respondents

felt webcasts had a positive effect on their grades. Bacro (2007) and Shapiro et al. (2007) also found the majority of survey respondents perceived webcasts of lectures as helpful in reaching their academic goals.

Lim (2006) provided postgraduate geography teacher trainees with nine 75-minute webcasts of classroom discussions. Participants used the webcasts as a means of catching up on material missed during absences and to "replay and reflect upon the issues discussed in class, at times and places of their own choosing" (p. 4). Lim (2006) reported pictures were especially useful for geography-based webcasts indicating webcasts may be useful in producing Paivio's (1979) theory of dual-coding.

Although studies (Barcro, 2007; Brittain et al., 2006; Shapiro et al., 2007) found students perceived webcasts to have a positive effect on their grades, a Jacksonville University pilot study (Baker et al., 2007) found webcasts did not significantly improve student performance on assessments. During an aviation course, two webcasts were provided for students (N=4). Each webcast was a 10-minute summary of a 50-minute classroom lecture. Quizzes were administered covering the lectures the webcasts summarized and were compared to quiz scores on identical assessments from the previous semester given to students (N=17) without the benefit of webcasts. Although students with webcasts did not perform significantly better when compared to students without webcasts, the researchers noted "the sample size is too small for much validity to be attributed to this result" (p. 4). A larger study was conducted during the 2007 fall semester, and the results indicated "no significant difference between classes using [webcasts] and historical data from classes not using [webcasts]" (Russell Baker, personal communication, December 28, 2007).

Purpose

Although studies including Bacro (2007), Baker et al. (2007), Brittain et al. (2006), Copley (2007), Lim (2006), and Shapiro et al. (2007) have shown university students effectively utilized webcasts, no studies found addressed whether high school and junior high students would do the same.

The purpose of this study was to evaluate student use and perceptions of webcasts containing recorded lectures during a 21 day unit in an urban public junior high school with a high population of low income students. Through a post unit survey, the following research questions were addressed:

1. How many students viewed at least one webcast for the unit and for what purpose were the webcasts viewed?
2. How many students had access to an MP4 player or the Internet at home and through which of these means did students view the webcasts?
3. How did webcast use and access to webcast technology vary according to student demographics?
4. Following the unit, what were students' attitudes concerning webcasts as an instructional tool?
5. Why did students decline to view a webcast?
6. What are students' predictions of how webcasts would affect their personal classroom attendance?

Method

Participants

Participants in this study were ninth grade history students attending a mid-sized urban junior high school in southeastern Idaho. When the survey was administered, 98 students were enrolled in the study. Participants included 32 students receiving free school lunch and 11 students receiving reduced-price school lunch due to socioeconomic status. Other demographics included six students classified as "gifted" for exceptional academic abilities, five students were on a Language Education Plan (LEP), and six students on Individualized Education Plans (IEP). The same student could belong to multiple demographics. During the course of the study five students transferred out of the study, and three transferred into the study. Students who transferred out of the study mid-unit were not given the survey. However, students who transferred into the study mid-unit were asked to recover missed information by viewing webcasts and were included in the survey results.

Each participant was assigned to one of four Western Civilization II classes by the school counselors. During the study students and teacher met for 21 days, Monday through Friday for 50 minutes each day during the 2008 winter semester. Information covered in the 21-day unit concerned the rise and fall of the Roman Empire.

Materials

A website (www.d91.k12.id.us/gale/borup) was created to contain all classroom materials covered during the 21-day unit. Posted materials included 12 webcasts of lectures, five assignments, and three supplemental readings. Webcasts were created on the instructor's school computer using the screen recording program Camtasia Studio 5.

Each lecture was created in two different formats: M4V format, so it could be downloaded and played on MP4 players, and as a streaming video to be watched on a personal computer with no downloading involved. The 12 webcasts included the same PowerPoint presentation given in class, the instructor's drawings and expanded explanations of material, and some supplemental instructional tools including four video clips, one website, and Google Earth. These recordings differed from the actual classroom experience only in that they did not contain student comments, classroom discussion, or some video clips shown during class. The average length of the webcasts was 22 minutes and 54 seconds. Most presentation slides contained at least one relative image designed to produce dual-coding.

Design and Procedure

A webcast of each class lecture was created and posted on a website the same day the lecture was given in class. School computers were made available before and after school and during students' 30 minute lunch, so students who did not have access to computers with an Internet connection at home could still have access to the information posted on the website.

At the beginning of the unit, students were given a tutorial on how to access the website and view webcasts containing class lectures. Also, the website address and instructions on how to access the information were printed on business cards and given to each student in the study. The same business cards containing the website and instructions on how to access the information were also given to parents and guardians who attended parent-teacher conferences held the evening of the 15th day of the unit and the morning before the 16th day of the unit.

Analysis

A survey (see Appendix) was given at the end of the instructional unit. The survey was administered at the beginning of each class by a school counselor with the teacher absent from the room. During the following week those students who were absent on the day of the survey were sent to the school library where the same survey was administered by the school librarian.

Respondents wrote their name on the survey in order to track demographics. Before completing the survey, participants were informed their answers would be kept confidential from the course instructor. To protect student confidentiality, a third party removed student names and gave each survey a unique tracking number to ensure the instructor never saw respondents' names.

Results

In order to answer the research questions a post survey was administered to the 98 students enrolled in the study with a respondent rate of 96% (n=94).

In response to the first research question, the survey found a majority of respondents (n=49) indicated they viewed at least one of the 12 webcasts during the study. Of the 49 students who watched a webcast, 38 used webcasts to prepare for the end-of-unit exam and 33 used webcasts to recover information missed due to absences. Students were also asked how many webcasts each viewed. Although one student reported having viewed at least one webcast, the student did not report the number of or for what purpose the webcasts were viewed. This student was included in the total number of students who viewed at least one webcast but was excluded from the total number of students who viewed a webcast to recover missed notes or study for the end-

of-unit exam and from the total number of viewed webcasts. Included in the survey responses were four students who gave an estimated range of webcasts viewed. In those cases the high and the low number in the range were averaged to find a single number of webcasts viewed. When asked "How many webcasts did you watch to *review for the exam*?" one student responded with "most of them." This response was recorded as a seven in order to give a quantitative value to the response. In addition, when asked "If you used webcasts to *recover missed* notes, how many webcasts did you watch to recover the notes?" one student responded with "as many needed." This survey was given the numerical value of four to correspond with the number of lectures the student missed due to absences. In total, students reported viewing webcasts a total of 216 times (74 webcasts viewed to recover missed information and 142 webcasts viewed to prepare for the end-of-unit exam).

In response to the second research question, the survey found 79 of the 94 participants reported they had the Internet at home and 53 indicated they owned an MP4 player. Of the 49 participants who watched at least one webcast, 47 participants had access to a computer with the Internet at home, and 36 owned an MP4 player. In contrast, of the 45 participants who did not view a webcast, 32 had access to a computer with the Internet at home, and 17 owned an MP4 player. Of those who watched at least one webcast, 36 had both a computer at home with the Internet and an MP4 player. In comparison only 12 of those who did not watch any webcasts had both.

In order to find the means by which students viewed webcasts, the survey asked, "What did you use to watch webcasts? (circle all that apply.)" Forty-five respondents reported they watched a webcast on a computer at home, four on an MP4 player, two on a

computer at school, one on a computer at a friend's house, one on a computer at a parent's workplace, and one did not respond.

The third research question examined how the use of webcasts varied according to student demographics. Of the survey respondents (n=94) 40 students were receiving free or reduced-price school lunches. Of those 40 respondents, 18 watched at least one webcast during the unit, 27 had access to the Internet at home, and 19 owned an MP4 player. In contrast, of the 54 students who were not receiving school lunch for free or at a reduced price, 31 watched at least one webcast for the unit, 52 had access to the Internet at home, and 34 owned an MP4 player.

Six survey respondents were on an IEP. Of those students, four had access to the Internet at home and two owned an MP4 player. Four IEP respondents watched at least one webcast during the unit. Two survey respondents were on a LEP. Both LEP students had Internet access at home and an MP4 player, and one watched a webcast during the unit. Of the six respondents who were classified as gifted, all had access to the Internet at home, and two also owned an MP4 player, and three watched at least one webcast during the unit.

In order to address the fourth research question respondents were asked six questions all using a five-point Likert scale (1=Strongly Disagree and 5=Strongly Agree). All students (n=94) responded with an average of 4.06 to the statement, "Having a website that contained all classroom assignments and webcasts of lectures was helpful." Respondents also showed a desire for more teachers to use webcasts in their classrooms. When asked to respond to the statement, "You would like more teachers to create webcasts of their lectures" responses averaged 4.24.

Those participants (n=33) who used webcasts to recover missed notes also indicated they felt they had learned more by using the webcasts. Using the above mentioned Likert scale, the 33 participants who indicated they used webcasts to recover missed information due to absences responded to the following statement with an average response of 4.24: "When compared to other ways that you have used to recover missed notes, you *learned* more by recovering notes while watching webcasts." The same respondents on average also indicated using webcasts made recovering missed notes more enjoyable. The same 33 participants responded with an average of 4.06 to the statement, "When compared to other ways you have used to recover missed notes, recovering notes while watching webcasts was more *enjoyable*" and a 4.33 to the statement, "You were more likely to recover missed notes because webcasts were available."

Using the same Likert scale, the 38 respondents who reported they had viewed one or more webcasts to review for the end-of-unit exam responded with a 3.92 to the statement, "Webcasts allowed you to do better on the exam than you would have otherwise."

In order to address the fifth research question, students were asked an open-ended question on why they did not watch a webcast. While this study was quantitative in nature, qualitative responses were used to clarify and expand the quantitative findings. Of those respondents (n=45) who did not watch a webcast the most common reason (n=12) was the absence of a working Internet connection at home. Other common responses included 11 students who wrote they did not view any webcasts because they did not miss any notes, eight students cited a lack of time, and six students indicated they saw no

need. Responses included the following: “Don’t care,” “I have a computer with Internet but I can’t use it,” “I don’t have a reason for not using them, I think they would help, but I don’t try enough in class,” “I have not cause I have had no time, I would love to though and I am going to try my hardest for the next Test and when I’m absent,” “I do not have a hard time remembering material, and when I miss I just ask a friend what we did,” and “I’m always busy with sports.”

Respondents (n=49) who had watched one or more webcasts during the unit also had an opportunity to explain their views concerning webcasts. Student comments included, “I have missed about 10 days, and in class he explains it more thoroughly verbally so if you just copy the notes from another student, you’re not getting the lecture, so you still miss the information,” “I was absent a few days & it made it easy to make up,” “Greatly helped me catch up because I transferred into this class about halfway through a chapter,” “When I was absent I could watch the webcast and it was just like being at school,” and “My test grades went up. It was easier for me to study and I didn’t have to bring my notes home. I just got on the computer. Great!”

In order to answer the sixth research question, all 94 survey participants responded to the following statement: “If more teachers created webcasts of their lectures you would be more likely to miss class.” Nine respondents indicated they would be more likely to miss class, while the other 85 reported the webcasts would have no effect on their class attendance. Of the nine who indicated they would be more likely to miss class, eight gave reasons why. The following are the eight given responses on why they would more likely miss class. “Because if there’s the notes & you can just get them at home, why would you come?” “I would rather be homeschool.” “can get all info off

internet/don't need to attend class." "Students who think the podcasts are just a way of cutting classes they are right they are only missing other opinions on the topic." "Not that I'll purposely miss class." "Then I know that I can make it up!" "I would miss more class yes!!!!!!!!!!!!!!!!!!!!!!"

The 85 respondents who indicated they would not be more likely to miss class due to the availability of webcasts were also provided the opportunity to explain their answer in an open-ended response. The most common explanation (n=31) was to point to their prior attendance record and to emphasize the perception that they had only missed class when they had to. Twelve felt the quality of learning is better at school than watching a webcast, seven cited threatened punishments from either the school or from home as a deterrent to missing class, four saw it harder to make up material missed on students' own time, four felt they would only watch webcasts if they missed class, three indicated they would not watch the webcasts anyway, and two saw school as enjoyable. Twenty-one gave no explanation. Two students indicated they would not miss class although they predicted their peers would: "I wouldn't but more students would Think well it's online so I don't have to go to class" and "School is a pastime for me, but I know that other students would. they would come once a month to turn in all their assignements."

Discussion

The author found webcasts could be used successfully in a junior high school to help students recover missed notes and study for exams. The students showed a positive perception of webcasts, similar to the attitudes of university students reported in previous studies (Bacro, 2007; Copley, 2007; Brittain et al., 2006; Lim, 2006; Sharpo et al., 2007). Over half of the participants reported they had watched at least one of the 12 webcasts

provided for the unit. On average, those students who watched at least one webcast to recover missed information perceived webcasts to be both more enjoyable and more educational than traditional methods of note recovery. Those students also reported they were more likely to recover missed notes when webcasts were made available. In addition, students who watched a webcast to review exam information, on average, felt their exam scores improved as a result.

This study also showed students want more teachers to provide webcasts of lectures. Of the 94 post-study survey respondents, over 94% (n=89) felt the website containing assignments and webcasts was helpful, and over 85% (n=80) indicated they wanted other teachers to provide webcasts containing lectures. Teachers and schools need to recognize the growing demands of the "digital natives" (Prensky, 2001, p. 1) in their classrooms and seek innovative ways to meet their needs.

While educators work to meet the demands of the digital natives in their classrooms they need to also mind the gap between those students who have access to webcast technology and those who do not. Concerning the use of webcasts in public schools, Valesky and Sabella (2005) concluded:

> Technology, computers, and the Internet seem to have become a ubiquitous component of life in the United States, yet there still exists a digital divide among the "haves" and the "have-nots." High speed Internet connections, computers, MP3 players, microphones, etc. do cost money which may prevent the economically disadvantaged from benefiting from this promising emerging technology. (p. 8)

The digital divide can be wider in a public school than it is at a university. This gap becomes clear when you examine those respondents who watched a webcast in the study in comparison to those who did not. Of the 49 survey respondents who reported they had watched at least one webcast, nearly 96% (n=47) had access to the Internet at home, and over 73% (n=36) had both Internet access at home and an MP4 player. Comparatively, of the 45 respondents who reported they did not watch a webcast, under 72% (n=32) had access to the Internet at home and under 27% (n=12) had both Internet access at home and an MP4 player, indicating students who were exposed to webcast technology and from a higher socioeconomic status were more likely to view a webcast.

This was also made clear when survey respondents who were receiving school lunch gratis or at a reduced price were compared to those respondents who were not. Of the 54 students who were not receiving school lunch for free or at a reduced price over 57% (n=31) watched at least one webcast during the unit. In contrast, of the 40 respondents who were receiving lunch gratis or at a reduced price, 45% (n=18) watched at least one webcast during the presentation of the unit. This disparity could be explained by the fact that over 96% (n=52) of those post-study respondents not receiving lunch for free or at a reduced price had access to the Internet at home, whereas under 68% (n=27) of respondents receiving lunch for free or at a reduced price had access to the Internet at home. While a complete discussion of the digital divide in public schools was beyond the scope of this study, its results indicate further study of socioeconomic status as related to webcasts is merited.

Although webcasts can be an effective tool for students for both note recovery and as a study aid, it is not the only method that should be used. Students with lower

socioeconomic status would benefit more when webcasts are used in conjunction with more traditional means of note recovery and exam preparation.

Also, unlike universities whose funding is largely determined by the number of students enrolled, public schools receive much of their funding according to the number of students who actually attend class. School administrators in underfunded schools may avoid using webcasts due to a concern regarding the potential for lower attendance as a result. Although less than 10% (n=9) of respondents indicated webcasts would decrease their class attendance, administrators may feel any increase in student absences is too much and fear an increasing number of students would feel like the adamant respondent who wrote, "I would miss more class yes!!!!!!!!!!!!!!!!!!!!!"

George Boland, the superintendent of Idaho Falls School District 91 (wherein this study was conducted) and a member of the board for the Idaho Digital Learning Academy, reported a 1% drop in overall student attendance would result in a loss of $440,000 in funding for his district. However, Boland also views webcasts as a positive addition to classrooms and does not foresee a drop in student attendance in the near future. He noted, "There is a significant difference between online learning and face-to-face learning" and the overall quality of face-to-face instruction is superior. He also believes his view is shared by parents who would prevent students from missing class, "The kids may say 'a drop in attendance' but what would the parents say?" Boland also sees the current policy of linking school funding to student seat time as "an obsolete model" for the digital age (personal communication, June 10, 2009).

Also, it is unclear whether webcasts actually improve student learning. More studies need to be performed to address whether webcasts actually increase student academic performance.

Unintended benefits of posting webcasts of lectures were found. The author, as a mentor to teachers new to the course content, found learning the curriculum is a common concern for new teachers. Prior to webcasting lectures, the author would provide new teachers with the same PowerPoint presentations given to students. However, much like providing students with paper copies of PowerPoint presentations, teachers were missing much of the information, including expanded explanations and teaching methods. Webcasts of lectures became a tool to quickly and easily convey a lesson to teachers learning the content. With webcasts, teachers could be mentored by more experienced teachers regardless of distance. Other webcast implications for education could include teacher-to-teacher evaluations, administration observations, and student created presentations.

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Appendix

Webcast Survey

1. Do you have a computer with Internet access at home?
    a. Yes
    b. No

2. Do you own a video MP3 player (iPod, Zune, etc.)?
    a. Yes
    b. No

3. Did you ever go online to retrieve a missed assignment? Yes / No

4. Had you viewed webcasts prior to hearing about them in this class? Yes / No

5. Having a website that contained all classroom assignments and webcasts of lectures was helpful.
    1. Strongly disagree
    2. Disagree
    3. Neither disagree nor agree
    4. Agree
    5. Strongly agree

    Please explain your answer:_____
    _____

6. How did you recover missed notes for this class during the last unit?
    (Circle all that apply)
    a. I hand copied the notes form a peer's notes
    b. I took notes as I watched a webcast
    c. I didn't miss any notes this unit due to absences
    d. I missed notes this unit due to absences but I didn't recover any of them
    e. Other (explain)_____

7. You would like more teachers to create webcasts of their lectures.
    1. Strongly disagree
    2. Disagree
    3. Neither disagree nor agree
    4. Agree
    5. Strongly agree

    Please explain your answer:_____
    _____

8. If more teachers created webcasts of their lectures you would be more likely to miss class.
    1. Strongly disagree
    2. Disagree
    3. Webcasts would have no effect on my attendance
    4. Agree
    5. Strongly agree

    Please explain your answer:_____
    _____

9. Did you view **any** webcasts for this class? Yes / No

    If no, please explain why not and you don't need to answer the rest of the survey.

10. If you used webcasts to *recover missed notes*, how many webcasts did you watch to recover the notes? ____

11. Did you use webcasts to *review* for the exam? Yes / No

12. How many webcasts did you watch to *review for the exam*? ____

13. How many webcast did you watch in total (add your answer for question 10 to your answer for question 12? ____

14. What did you use to watch webcasts (circle all that apply)?
    a. A computer at home
    b. A computer at school
    c. A video MP3 player
    d. Other_____

15. When compared to other ways that you have used to recover missed notes, you *learned* more by recovering notes while watching webcasts.
    1. Strongly disagree
    2. Disagree
    3. Neither disagree nor agree
    4. Agree
    5. Strongly agree
    6. I didn't use webcasts to recover missed notes

16. When compared to other ways you have used to recover missed notes, recovering notes while watching webcasts was more *enjoyable*.
    1. Strongly disagree
    2. Disagree
    3. Neither disagree nor agree
    4. Agree
    5. Strongly agree
    6. I didn't watch any webcasts to recover missed notes

17. You were more likely to recover missed notes because webcasts were available.
    1. Strongly disagree
    2. Disagree
    3. Webcasts had no effect
    4. Agree
    5. Strongly agree

18. Webcasts allowed you to do better on the exam than you would have otherwise.
    1. Strongly disagree
    2. Disagree
    3. Webcasts had no effect on my exam score
    4. Agree
    5. Strongly agree