ENHANCING STUDENT COMPREHENSION WITH VIDEO GRADING

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Abstract

Engineering students, like other students, have different learning styles. Many techniques have been developed in the classroom setting to address these differences, and these approaches have been well documented. One of the more interesting approaches is the inverted classroom, in which students view short videos prior to lecture. However, when it comes to providing feedback to students on submitted assignments, the main method employed is the written comment. This method continues to be used because it is simple to do, can be performed offline, and is domain agnostic. However, written feedback is often highly ineffective.

This paper presents an alternative method for providing feedback to students that represents a natural extension to the inverted classroom: video feedback. In lieu of written feedback, students are provided feedback for computer programming exercises through the use of a short video made via video capture and incorporating oral commentary by the instructor as the assignment is graded. The article describes the technique used, student perceptions of the technique, a comparison of faculty effort, and assessment from two private 4-year institutions in the Midwest.

Introduction

It is well known within the educational community that students exhibit different learning styles. These learning styles have been well documented and analyzed across different disciplines. Effective teaching involves understanding these styles and adjusting ones classroom presentation to appropriately match the needs of the students. Overall, there are six prominent learning style models in the literature, as is shown in Figure 1.

These models together, coupled with an increased effort on ensuring student success in the classroom, have resulted in changes in the classroom environment. Effective teachers employ multimodal approaches to ensure that material is both taught and reinforced using different approaches. Active learning, Co-Operative Learning [2], problem based learning, inquiry based learning, and other techniques are all routinely applied in the classroom to improve student achievement. These approaches work well in the traditional classroom. But at some

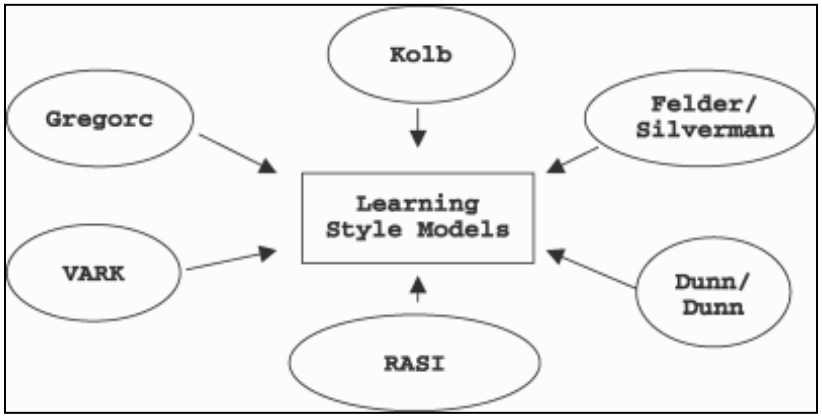

Figure 1: The six prominent learn style models.[1]

point, every instructor has an assignment that needs to be graded. And while the classroom dynamic is important in ensuring student achievement, providing students with high quality feedback on submitted work is equally important. Hounsell states:

"It has long been recognized, by researchers and practitioners alike, that feedback plays a decisive role in learning and development, within and beyond formal educational settings. We learn faster, and much more effectively, when we have a clear sense of how well we are doing and what we might need to do in order to improve."[3]

Feedback has been shown to be the single most powerful influence on student success. [4] For feedback to be meaningful, it must meet many criteria, including being applicable to the student[5], delivered in a timely fashion, engaging to the students, and relevant to the topic at hand.[6] If students do not feel that this is true, they often ignore the feedback, either throwing away the assignment or simply looking at the final grade.[7]

To facilitate better feedback, effective instructors use grading rubrics to assess student performance. Rubrics aid faculty members in being more efficient [8] in grading and more consistent in grading. Computer assisted grading rubrics further aid in this area [9].

Despite all of the importance placed on feedback, the composition of student feedback has generally remained unchanged over the years. Written comments make up 79% of feedback received by students, though 45% of students reported that they rarely received individual written feedback on assignments [10]. This is clearly a problem, for many students readily admit that they do not read written comments [11].

To avoid this problem, oral feedback has been used. Audio commentary has long been used to evaluate student performances in the musical and arts forms, as it was convenient for an evaluator to speak into a tape recorder while judging an event. Oral comments have also been used informally in class and in team settings for an instructor to "coach" a team. However, only recently have formative studies of oral feedback taken place. In research studies, students have shown a preference for audio commentary over written comments [12]. However, in its current form, oral commentary is usually provided only if the student actively solicits it from the instructor, leading to issues of equity and effectiveness.

While beneficial, audio commentary in and of itself does not aid the visual learner. A visual learner needs to see things in context in order to understand their meaning. Thus, while audio commentary is an improvement over written feedback, it still is not optimal. To truly reach all student learning styles, feedback to the students must also incorporate visual feedback. Thus, the concept of video grading has been developed, which allows students to receive both oral and visual feedback in a timely fashion.

Video Grading Technique

PC technology has made many things possible, including the easy production of videos. In the educational realm, videos are used to teach students in the inverted classroom [13]. In lieu of reading a textbook assignment, students watch a brief demonstration video prior to class, and the class session focuses on problem solving and further explanation of the material provided in the video presentation. This method has proven highly successful at improving student interest, retention, and learning.

Video grading uses many of the same production techniques as the inverted classroom, in that the instructor creates a video during the grading session. It differs from the inverted classroom in that the video is customized to each student or student team based on submitted work, and the focus of the video provides targeted meaningful feedback to the student rather than introducing a new concept. This is

in some manner more difficult than the traditional usage of videos in the inverted classroom, as the traditional usage of videos in the inverted classroom allows the instructor to carefully design the video to maximize student learning, whereas video grading relies on the instructor being very spontaneous and does not allow for careful preparation and editing due to the number of videos that must be created.

Video grading starts in much the same manner as any other form of electronic grading. A student submits to an instructor an assignment in electronic format. This may be a PDF document, source code or some other format. Prior to the instructor grading the assignment, the instructor runs a screen capture program (i.e. Microsoft Expression) and dons a headset microphone. As the instructor reads and interprets the assignment, a stream of conscious verbalization of their thoughts is captured on the audio track. As the instructor marks up the document or comments on the source code, the student can see exactly the progression of markups in the document as well as hear additional explanation. Overall, the process is shown in Figure 2.

One distinct advantage of this process is that in addition to aiding visual learners, it really helps the students to see the non-linear process of assessing a submission. For example, when an instructor grades an assignment, they may refer back to a previous page if something contradictory is found later on or if a duplicated point is found. With this approach, since the student is visualizing exactly what the instructor saw when the assignment was graded, the student sees the instructor returning to the previous location and clearly can follow the reference.

Assessment of Technique

Video grading was used by two different instructors at different institutions over four courses. This allowed assessment information to be gathered about different types of courses in which assessment can be applied. While video grading was used for four courses, only the final three courses received formative assessment, as the first course truly was a pilot course, focusing on whether the technique could be used and not driven by any attempt to measure the success of the technique beyond simple comments.

The first course for which video feedback was used was an embedded systems course taught at the Milwaukee School of Engineering (MSOE). In this course, students created simple embedded systems in the C programming language. Deliverables included brief reports on their projects as well as a source code project which could be compiled on the instructor's machine. In this course, video feedback was tried purely on an experimental basis, and comments mainly dealt with explaining the problems of implemented source code as well as explaining the meaning of associated compiler warnings which were generated during code compilation. A brief review of the submitted reports was also provided. 12 students were enrolled in this course.

The second course, taught by the same instructor at MSOE, was a course in software requirements. In this course, students elicited requirements from stakeholders for a medical project. Deliverables were principally in the document format, and deliverables were completed in teams of 4 to 5. For this course, feedback from the professor mainly focused on the critique of the requirements artifacts, as well as questions addressing ambiguities found in the artifact when grading. 18 students were enrolled in this course.

The third course, again taught by the same instructor at MSOE, was a course in the Design of Operating Systems. In this course, students learned about the design aspects for an operating system. Deliverables for this course consisted principally of C programs and design documentation for those programs. Feedback from the professor focused on several aspects, including source code commenting, debugging

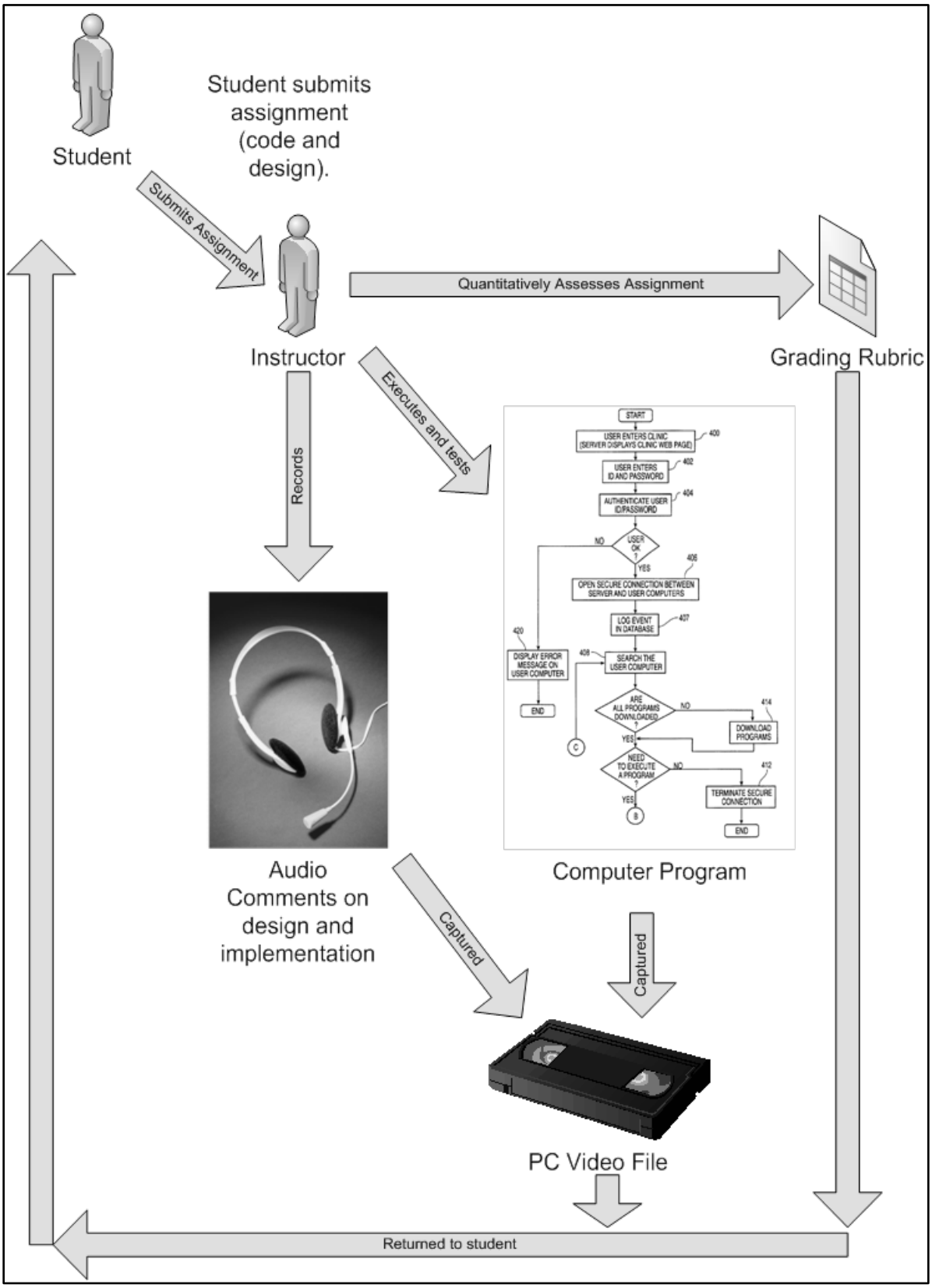

Figure 2: A workflow diagram for video grading.

of source code, and ad-hoc testing of the code. 21 students were enrolled in this course.

The fourth course, taught by a different instructor at Ohio Northern University, was an introductory programming course in which the students demonstrated proper functionality of their programs in a lab setting. Deliverables consisted of completed programs. Feedback from the professor mainly focused on the structure of the code and commenting techniques. 31 students were enrolled in this course.

Quantitative Student Assessment

With any new and novel technique, it is important that an assessment of its effectiveness occur. With a technique such as video grading, there are two dimensions which need to be assessed, namely student perceptions and faculty perceptions of the technique. For such a paradigm shift to occur, the process must be beneficial to students as well as effective for faculty members.

The first class which used video grading did not have any formal assessment technique applied. Rather, students were simply asked to provide free-form comments on the approach to the instructor. These comments, a sample of which is provided in Figure 3, were very positive, but did not yield a complete assessment of the effectiveness of the technique. These comments did, however, indicate that further study was prudent.

To provide a more advanced assessment of video grading, it first was necessary to determine the goals for the assessment. Based on this goal, a short Likert survey was constructed to provide quantitative feedback on the technique.

First and foremost, there was a need to know if the students watched the videos. No matter how successful they might be, if the students did not watch the video, then they would not receive the

> I thought the video was interesting. It was very nice to receive more feedback than a few red words within the code. Perhaps going through the report wasn't necessary, unless it was to answer questions being asked in it. It just seemed you were reading to me what I had written to you. Going through the code was very helpful though. – CE2810, Spring 2012
>
> As per your request I just wanted to let you know that I felt the video feedback was very nice. It was really helpful to see what you thought of my code and where/how it could be improved. In particular, I didn't even think about putting attributes static where appropriate.
> The only problem I can see with the video feedback is that the video files are massive! 11 megabytes when MSOE only offers us a measly 95... – CE2810, Spring 2012

Figure 3: Sample student comments from video grading from initial experimental class.

feedback on their assignment, negating the purpose for the video grading session. This then led into an assessment of the effectiveness of the video presentations and commentary. If the students did not feel the feedback was at least equivalent to traditional feedback mechanisms, then the technique would not be successful. The final area of assessment dealt with the technical issues of video feedback, such as making certain the videos were legible and could be seen clearly, as well as were the videos of the proper length. This led to the development of the survey questions given in Figure 4. Students were surveyed at the end of the three courses, after the video assignments were returned.

Overall, based on the survey results shown in Figure 5, the students unequivocally did watch the videos. In two of the three courses, the majority of students watched a majority of the videos. In the third class, all students indicated that they watched the one video which was used for video grading. While it is not possible to judge the students attention to the video, the fact that they admitted to watching the videos is a good sign.

Question	*Permitted Responses*
1. How many of the videos did you watch?	0, 1, 2, 3, 4 or more
2. I found the video format more helpful than traditional paper-based assignment feedback.	Not Applicable, Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
3. I found the audio commentary more helpful than traditional written comments.	Not Applicable, Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
4. I was able to read the text on the video.	Not Applicable, Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
5. I was able to clearly see what was being described in the video.	Not Applicable, Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
6. I felt that the length of the videos were:	Not Applicable, way too short, too short, about right, too long, way too long
7. I prefer video feedback to traditional feedback in computer courses.	Not Applicable, Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree
8. In what way(s) could video grading be improved to make it more useful for you?	Free form text.
9. Please enter any other thoughts or comments that you may have about video grading.	Free form text.

Figure 4: Survey Questions and Responses

How many of the videos did you watch?

Course	*4 or more*	*3*	*2*	*1*	*0*
Software Requirements and Specification*		57%	29%	14%	0%
Operating Systems Design	57%	29%	14%	0%	0%
Introductory Programming**			5%	95%	0%

*This course actually only had 3 assignments returned with video grading. Thus, the maximum number that could be watched was 3.

** This course actually only used video grading for one assignment. Thus, the student who responded with a 2 can be designated as an erroneous response.

Figure 5: Students responses to the number of videos watched.

With students clearly watching the videos, the next question to address was whether or not the videos were effective. In all cases, as is shown in Figure 6, the majority of students indicated that they preferred the audio and video feedback over traditional paper based feedback. There was a slightly more neutral feel for the Software Requirements and Specification course, but overall, the sentiment was positive.

I found the video format more helpful than traditional paper based feedback.

Course	*SA*	*A*	*N*	*D*	*SD*
Software Requirements and Specification	29%	49%	29%	0%	0%
Operating Systems Design	29%	57%	7%	0%	7%
Introductory Programming	35%	45%	10%	5%	5%

I found the audio commentary more helpful than traditional written comments.

Course	*SA*	*A*	*N*	*D*	*SD*
Software Requirements and Specification	43%	43%	14%	0%	0%
Operating Systems Design*	50%	29%	14%	0%	0%
Introductory Programming	40%	50%	5%	0%	5%

* Note: Responses do not add up to 100% due to 7% of students selecting “Not applicable”.

Figure 6: Students responses to whether or not video grading was effective.

In order to facilitate effective communication using the video format, it was important that students be able to read the onscreen text as well as visualize the items being described. The legibility of the onscreen text was impacted by the compression ratio, the frame rate, and resolution of the video. Video resolutions were generally 600 x 800 with a frame rate of 15 frames per second. Higher compression ratios and lower resolutions yielded smaller files which were easier to return to students but suffered from video processing artifacts. Overall, in all cases, the students did not have trouble with the videos from a technical standpoint, as is shown in Figure 7.

I was able to read the text on the video.

Course	*SA*	*A*	*N*	*D*	*SD*
Software Requirements and Specification	72%	14%	14%	0%	0%
Operating Systems Design	57%	36%	0%	0%	7%
Introductory Programming	55%	30%	5%	5%	0%

I was able to clearly see what was being described in the video.

Course	*SA*	*A*	*N*	*D*	*SD*
Software Requirements and Specification	67%	17%	17%	0%	0%
Operating Systems Design	31%	62%	0%	0%	7%
Introductory Programming	55%	40%	0%	0%	5%

Figure 7: Students responses to the legibility of text on the screen.

The last major aspect to be dealt with was the length of the videos. It is known that students have a limited attention span in class, potentially as short as 11 minutes [14], which corresponds to the time between commercial breaks on television. In grading the assignments, the goal was not to have excessive video length, but full explanations for the assignment were also desired. Thus, the length of the videos varied by class and assignment, as is shown in Figure 8. The assignments for Software Requirements and Specification tended to be larger, as the deliverables which were being assessed were significantly longer and had been completed in teams.

Course	*Video 1*	*Video 2*	*Video 3*	*Video 4*	*Video 5*
Software Requirements and Specification	22:08	11:44	20:41		
Operating Systems Design	2:53	6:44	6:30	7:23	9:54
Introductory Programming	5:10				

Figure 8: Average video length in mm:ss format.

This data can then be compared with the student responses on the survey. Overall, even given the variance in length of the videos, the students felt that the length was appropriate, as is shown Figure 9.

I felt that the length of the videos were:

Course	*Way too short*	*Too short*	*About right*	*Too long*	*Way too long*
Software Requirements and Specification	0%	0%	50%	50%	0%
Operating Systems Design	0%	0%	100%	0%	0%
Introductory Programming*	0%	5%	85%	5%	0%

*5% of students chose “Not Applicable” for this question.

Figure 9: Students responses to the length of the videos.

The final analysis of the effectiveness of video grading hinged on the final question of the survey, did students prefer video feedback to traditional feedback in computer courses. Again, as is shown in Figure 10, the majority of students preferred video feedback, especially in the Operating Systems Design course.

I prefer video feedback to traditional feedback in computer courses.

Course	*SA*	*A*	*N*	*D*	*SD*
Software Requirements and Specification	20%	40%	20%	20%	0%
Operating Systems Design	38%	54%	0%	0%	8%
Introductory Programming	30%	40%	25%	5%	0%

Figure 10: Students responses to the method of feedback used.

Qualitative Student Assessment

While the quantitative assessment provides strong support for the technique, the written comments provided by the students provides better details into some of the issues the students had with video grading. While most of the comments (shown in Table 1) were again

positive, a few areas of student difficulty did appear.

One area of potential concern from students was the ability to re-review the material. With traditional paper based comments, a student can easily go back through the artifact and re-read the comments from the instructor. This process is not as easy to do with video grading, as the only way to review the commentary is to watch and listen to the video again.

Another area of concern expressed by students was the relationship between coverage and time. While the students stated that full coverage of a large lab might be time prohibitive, they expressed a concern that in trying to fit the grading session into a short video, problems in the assignment might be missed.

Faculty Impact

A major paradigm shift potentially can have a major impact on the faculty member, and thus, it is important to look at video grading from the faculty members standpoint.

The first question which must be answered is: does video grading require additional faculty time or does it offer a reduction in the time spent grading? Overall, it was found that video grading did not increase the time spent grading by a significant amount. The time spent assessing the submission was about the same as would be spent with traditional feedback mechanisms. There was an added processing component that would not be present in traditional grading dealing with generating the videos from the video capture. In the case of the introductory programming course where a single assignment was returned, the average recording and processing time for each video was 8 minutes, 27 seconds, with an average video length of 5 minutes, 10 seconds. However, the processing of 3 minutes, 17 seconds could easily be batched and performed offline when the professor was not present, making the recording time the limiting factor.

Given that the operating systems design course had been taught previously and used the same sets of labs, a direct comparison could be made, normalized for the number of students. Overall, the net amount of time spent grading per student was within 5% when using video grading and traditional grading, with the only additional overhead being a slight increase in the time spent uploading the responses for the students to retrieve them.

Future Work

There is obviously much more research to be done to assess the effectiveness of video grading. The scope of this formal evaluation was small (three classes) and the sample size also was very limited. However, it is believed that this is an acceptable way for assessing student work that offers unique advantages in the digital age.

One of the most important questions to answer is what type of assignment benefits the most from this form of assessment. In the student comments, there seemed to be a feeling that this type of grading benefitted the students the most when the assignment was to write a computer program as the students were actually able to see how the professor tested their program as well as how the professor used exploratory techniques to uncover the root cause of failures. The technique did not seem as beneficial in the requirements course, where the main deliverable was a document. However, there are many other types of activities in modern engineering that might benefit from this approach. Design critiques, in the computer field using UML, or in mechanical engineering using a CAD tool, might be very beneficial to students.

It is also important to try and understand the mindset of a student that benefits the most from video grading. One student in his free-form comments indicated that he was a visual learner. It is possible that some types of students might receive a greater benefit from this approach versus traditional techniques. It might also be that students with certain disabilities, for

Table 1: Student freeform comments on video grading.

Course	Student Written Comments
I found the video format more helpful than traditional paper-based assignment feedback.	
Software Requirements and Specification	• *The only downside is the time it takes to listen to the videos, unavoidable but still nice to hear what you're thinking.* • *It was nice to see the thought process of your grading, as you're grading.*
Operating Systems Design	• *Excluding the audio, as I see that's in the following question, the video format helps most in being able to show a test run of the assignments.* • *I thought it was very insightful to hear what you were thinking as you were thinking it. Sometimes a lot of that thought process is lost when written down, so a video record helps catch that info. Additionally, it helps that we see exactly what problems you're having with running the program, if there are any.* • *While hearing the feedback vs reading the feedback makes no difference to me, handwriting at times can be very hard to read. This was eliminated using the videos.*
Introductory Programming	• *Audio and visual feedback is fantastic.* • *It helped to be able to see exactly what he was referring to.* • *It was extremely helpful to receive personalized feedback for my specific program. This way, I could learn about some of the smaller things that my code needs so that it can really become the best that it can be.* • *Audio and visual feedback is fantastic.* • *Same as above comment.* • *It makes it easier to understand by seeing it and hearing what is wrong rather than reading sometimes cryptic text.* • *Understatement of the century.* • *Video feedback is much more insightful than traditional paper-based feedback.* • *I got to see visually Dr. Estell explain to me ways to improve my MP3. I thought that was a good idea because I am a visual learner.*
I found the audio commentary more helpful than traditional written comments.	
Software Requirements and Specification	• *Audio comments, while taking longer, provide much more in-depth feedback as well as including feedback that is not easily included in written feedback. I believe that the rubric and summary are important parts of the feedback process, however.*
Operating Systems Design	• *The audio commentary has much higher potential for actual reviewing of the code than of written comments. I think a large part is the ability to be nonlinear in how the code is analyzed, as opposed to written comments on a listing having to be in order of each file. More depth can also be gone into on specific points of the code than what can be fit in the margins of a listing. The downside came from the fact that for larger labs, only a small portion of the code was really covered in the videos; however the amount of time required to go more in-depth on larger labs could be prohibitive in itself. I feel that a combination of audio and written comments, maybe with the audio focusing on higher level structural/design with more targeted written comments where required, would provide more useful feedback with larger labs.*
Introductory Programming	• *Again, as before, the personalized comments while going through my entire code were very helpful.* • *I think that the audio was more helpful because it can be sometimes hard to understand what a teacher is meaning when written on a piece of paper but since the audio had visual there were no problems putting 2 and 2 together.*
I was able to read the text on the video.	
Introductory Programming	• *readable but sometimes blurred from glitching*
I was able to clearly see what was being described in the video.	

Introductory Programming	• *To follow the program as you walk through it was great feed back.* • *The video quality was fine. Dr. Estell was very thorough in his explanations*
I felt that the length of the videos were:	
Software Requirements and Specification	• *The length was long, but less time would make the video feedback far less useful* • *Perhaps a 5 minute limit*
Operating Systems Design	• *Would have liked them to be slightly longer on labs which contained more code*
Introductory Programming	• *Honestly, I don't mind how long the video actually is as long as I am receiving helpful feedback the entire time. In this instance, I was receiving extremely helpful feed back the entire time, which is the most important reason for doing these videos.* • *Dr. Estell seemed to go into enough detail to get his point across on how to improve my code and he didn't draw the explanation out or shorten his explanation.*
I prefer video feedback to traditional feedback in computer courses.	
Software Requirements and Specification	• *Easier to reread paper than go back in video.*
Operating Systems Design	• *I think they were pretty solid. They provided just the right amount of information. It was nice.*
Introductory Programming	• *Since the class is based around computers, it helps to be able to have a video walking through exactly what I did right and wrong.* • *Either works for me, it doesn't matter to me*
In what way(s) could video grading be improved to make it more useful for you?	
Software Requirements and Specification	• *If different professors were involved in the video grading process collaboration for improving the process might help; I have no suggestions at this time.*
Operating Systems Design	• *I can't think of any ways to improve the video grading for this course.*
Introductory Programming	• *Because this is my first exposure to video grading, I'm afraid I cannot comment on this too much. I found it very useful in the first place, so trying to find a way that it could become more useful would be tough. Possibly other writing or symbols, similar to a Smart Board.* • *The video was very useful. I cannot think of anything to help improve it.* • *Do a few video gradings' a semester, maybe three or so, that way you can see if you improved throughout the course.* • *I thought it helped pretty well how it was done. I got a lot out of it from how to comment and format better to being shown that some of my algorithms could be simplified.* • *i thought it was pretty good. The only thing that was wrong with it was that there was a little lag.* • *explanation about my own code and how I can improve my code was very helpfull I think that if the comments that Dr. Estell makes if they also showed up on the screen to the side for a visual effect that would also be beneficial*
Please enter any other thoughts or comments that you may have about video grading	
Software Requirements and Specification	• *In a course like Software Req+Specs, video grading is nice to have, but actually seems it might be more trouble than it's worth. There's no product after labs that we need to demonstrate, just a report, so there's not much to talk about - either we reported something correctly, or we didn't. In order to keep the video short, you had to skip over a lot of content of reports, only taking samples of the overall work. I don't think this helps overall - what if you skip over a really big mistake? Then you'll have to resort to looking through the report and handwriting the comments anyway, which seems to defeat the purpose of doing video grading in the first*

	place. • *Should be continued* • *Good idea, takes a little long but insightful comments make the value about the same as written.*
Operating Systems Design	• *I think in a course like operating systems, where the labs are a little more technical and have a product where we need to demonstrate something, video grading is very helpful.* *You should look into some video editing tools to help with proper compression. This would help with the issues of distributing the videos.*
Introductory Programming	• *I really like the video grading, and I hope that it will be done more often in the future.* *It was interesting because the situation is completely different when it is my code. I can actually see where i went wrong and know where I need to make improvements.* *It helped me realize things I wasn't doing completely correctly.* *I thought it was a cool idea and helpful.* *This is the future.* *It was easier to learn from my own code. thanks*

example autism or ADHD, might see a drastic improvement in their performance by receiving video feedback. The combination of audio and video feedback might also be beneficial to certain classes of students with visual impairments.

A detailed study of the differences in student achievement when using video grading also needs to occur. While the students were favorable toward the video grading approach, no attempt was made to measure a difference in student performance against course outcomes. If the students are truly paying attention to the comments, and the comments are relevant, then there should be a noticeable improvement in student performance against learning outcomes.

Further research needs to be done on the length of the videos as well. It is known that human beings have limited attention spans. Clearly the 20 minute videos used may have been too long, just as a 50 minute lecture without appropriate active learning exercises can be too long. But, what is the appropriate length for a custom video which will retain the student's interest as well as appropriately convey feedback to the student? And what coverage of assignments is acceptable in a video?

And lastly, it is important that this approach be tried in different disciplines. The fields of computer science and software engineering, by their inherent technical nature, often apply technology in advance of other disciplines. Certainly there are other areas where such an approach might prove prudent. Mathematicians could clearly show a student the problem with a proof while explaining their thinking in a verbal fashion. Structural engineers could, for example, use a video to demonstrate how a specific force might break a student's truss design, causing a structural failure. And lastly, students giving oral presentations could be critiqued verbally with an additional audio overlay of a video presentation.

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