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Article

Seeing through the eyes of the students: First impressions of recording in the classroom with a GoPro® head-mounted camcorder

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The first GoPro® camcorder I saw was the HD Helmet HERO (see Picture 1) worn by a bicycle motocross (BMX) rider in a promotional video ("GoPro," 2010).[1] Watching footage from helmet-mounted, stationary, and hand-held positions, I could readily compare the perspectives. The benefit of the helmet-mounted HERO, of course, is that viewers can watch the event through the eyes of the rider, vicariously experiencing the action. Interested in possible classroom applications, I went to the GoPro website, and discovered that they offer a number of products, including both standard and high definition (HD) camcorders and accessories. The HD Helmet HERO appeared to have the greatest potential for video capture in the classroom because it has a headlamp-style head strap, rechargeable lithium-ion batteries (lasting 2.5 hours), full HD video, and built-in audio. Recordings are saved on

Picture 1: GoPro® helmet HERO

an SDHC card up to 32GB, providing 4- to 8-hour recording times depending on the choice of 5 video resolution modes. I thought that if the camera is light enough not be an encumbrance, it could help teachers see classroom events through the eyes of students.

Considering potential benefits

Before purchasing the camera, however, I considered the advantages the GoPro might provide over camcorders and perspectives typically employed to collect classroom data. I recalled using an old Hi-8, stationary camcorder with a fish-eye lens mounted to the wall in the upper corner of the classroom to explore relationships between student anxiety and engagement (Kindt, 1997). While this perspective helped increase my understanding of the nature of student interaction in a number of ways, it was limited by the static position of the camera and relatively poor quality audio. In a recent publication, Hindmarsh, Heath, and Luff (2010) discuss the advantages of gathering research data with fixed (static) and roving (handheld) positions, the fixed position providing a consistent, relatively unobtrusive view of the stream of action, and the roving position able to pinpoint particular aspects of the scene (pp. 38-40). Not surprisingly, they do not consider lightweight, head-held cameras, a relatively new technology (the Helmet HERO launched the summer of 2009) and the only position that would provide a truly participatory view.

Capturing the view of a participant, unencumbered by a handheld camera and unconstrained by a stationary perspective, seemed to be a clear advantage of the GoPro camera (Photo 1). I assumed it would provide a closer approximation of what the student

Photo 1: A participant view

(wearer) actually sees, hears, and says during the class. With this in mind, I noted some potential areas of study worth exploring with this innovative tool: 1) teacher instructional language, 2) student interaction, 3) task adjustment, including scaffolding techniques, 4) materials development, and 5) student and teacher behavior.

After finding no reports describing the implementation of GoPro equipment in language learning, applied linguistics, or educational literature and confident in the camcorder's potential, I ordered the Helmet HERO late in the summer of 2010, providing time to become familiar with the equipment before introducing it to oral communication strategies (OCS) courses at the beginning of the second semester (mid-September). At the time, I intended to use the camera with first-year students, but after the positive reaction — particularly the increased interest and enthusiasm — I also introduced its use to second-year students. At the time of writing (late November, 2010), I have collected 9 GoPro recordings approximately 90 minutes in length from each of 2 freshman and 2 sophomore second-semester OCS courses, designated OCS2•C and OCS2•D (meeting Friday mornings, first and second periods), and OCS4•C and OCS•D (meeting Tuesday mornings, first and second periods).

Introducing GoPro to students

To introduce OCS students to the GoPro camcorder, I used the same clips I saw at the GoPro website (www.gopro.com) (see Video capture 1). Preparing to talk about summer activities, I introduced BMX riding as one such activity and showed video clips from two perspectives, stationary and helmet-held. We then discussed some of the differences the perspectives provide, and what might be interesting to do with a helmet- or head-held camcorder. Students suggested activities like "climbing a mountain," "cooking something," "riding a roller coaster," and the like. Then I asked them to consider language learning, and our

Video capture 1: BMX rider wearing a helmet HERO

classes in particular. After some time to contemplate the idea, I showed students the camera and told them I would like to be able to see the class through their eyes, something that teachers rarely see, and I asked for general permission to use the camera and for a volunteer. In all 4 classes, agreement to make GoPro recordings and the first volunteer came quickly.

Thoughts on advantages and disadvantages

After 9 weeks of using the GoPro camera, it is possible to describe several advantages and disadvantages. They are presented together as there is often a corresponding disadvantage with every advantage, and vice-versa.

A participant's view

The greatest advantage, I believe, is the camera's ability to *capture a participant's view of events*, whether that of the teacher or a student (compare Photo 2 and Video capture 2). Never before have I been able to see a close approxi-

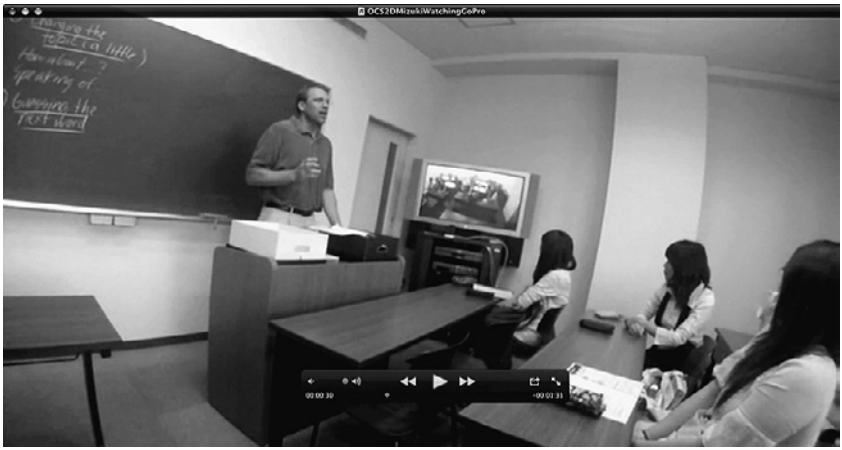
Photo 2:
Teacher's view of activity

Video capture 2:
Student's view of activity

mation of what students see. Students can, of course, hold their heads still and look elsewhere, and the camera is approximately 6 centimeters higher than their actual eye-level, but it provides an exceptional record of one participant's experience. A corresponding disadvantage is that it is still *just one view*, and in my OCS courses only one of 11 to 15 participant perspectives. By seeing and hearing what a student and his or her partner are doing during tasks, however, the teacher is better able to make informed pedagogical decisions, assuming that other students would interact similarly. This assumption can be problematic, but when individual differences — enhanced by viewing a number of students over several class meetings — are taken into account, the result can be productive. In fact, the process of reviewing videos has helped me *better understand both individual students and the classes in general*.

Recording instruction

Related to what students see and hear, the camcorder provided *excellent recordings of instruction* (Video capture 3). When only the teacher is speaking, the audio is clearly discernable, enabling the teacher to later examine his or her language of instruction. The wearer's voice is also clear. GoPro cameras do



Video capture 3: Capturing instruction

not yet have an external microphone, however, so it is *often difficult to hear the wearer's partner* in student conversations — especially when other students are talking. This problem can be overcome by asking partners to speak clearly and sit close to the wearer or by using IC recorders or other supplemental recording equipment, though that increases the technological burden on the teacher.

Capturing teacher behavior

Similar to teacher talk, the camcorder can *capture teacher behavior*. This is beneficial for teachers examining the effects of their body language, physical movement, gestures, and the like. This aspect of teacher development could, of course, be captured with a stationary camera, and perhaps even more effectively by an observer or assistant with a handheld camera. Even though a GoPro wearer will *not always focus on the teacher* during instruction, it is useful to examine teacher behavior as one of the things that students attend to.

The GoPro as presence pressure

Several students have commented that the GoPro camcorder provides a kind of virtual teacher's view, an extension of the teacher's *presence pressure*. In simple email feedback, one student wrote, "I think most of students will try hard if we have a camera in class because if we do something bad during the class, the camera is watching everything!!!" This also shows that *the camera is intrusive*, possibly affecting their behavior both positively and negatively. A number of students note that the camera does make them nervous, but with subsequent use, they get used to it: "It was really fun even I forgot that [my partner] was wearing the camera in the end. It doesn't bother me at all. I think it's really cool to see the video after so I like it!"

The effects of novelty

One of the obvious benefits of introducing the camera has been *the effect of novelty* on a number of levels. Some students have said that they have seen the camera used by comedians in stunts, and they find it interesting and unique (Photo 3). *This effect of novelty changes* from week to week. Some initial enthusiasm might also be tempered as students realize the camera is heavier and the headband less comfortable than expected. No students have yet noted that they disliked wearing the camera or having it as part of our classroom procedures, though some have struggled to put it in a

Photo 3:
The novelty of the GoPro camcorder

comfortable position. Student reaction would, of course, depend on individual students and classes, and it is possible that there will be changes in the 4 classes under study over the final 6 weeks of the semester.

A novel perspective for the teacher

Besides novelty for the students, for the first time in 21 years of teaching I have a reviewable record of the class from a student's perspective. This allows me to *explore new possibilities* that unavailable without the camera. Although an exciting addition to teaching and research tools, all *innovative procedures and activities require revision* to become effective. While it is true that using activities and materials for the first time inevitably requires adjustment and revision to increase their effectiveness, this alone should not deter applications of innovative technology or procedures (Beck & Kosink, 2006). One concern using GoPro clips and related materials may be that there is *too much innovation too often* for students to maintain a productive comfort level, especially for those that have a low tolerance for ambiguity or a propensity for carefully-controlled activities. Add to this that it is time-consuming to create one-off materials for each class, and it becomes apparent that the teacher needs to make judicious decisions on how much time and energy to invest. In the OCS classes under study, established feedback systems provide students with a way to influence these decisions: "I don't care about [the GoPro camera]. I welcome it, because I can realize how do I use conversation strategies or make some mistakes. I also want to watch other friend's video."

Logistic issues

When using GoPro equipment, there are also *a number of logistic issues* that require extra attention from the teacher. The majority of class meetings in the

classes under study have had immediate volunteers, but 3 times I had to encourage someone, usually the next person on the class list, to wear the camera. Again, permission to use the camera and understanding that wearing the camera would be voluntary was established the first day. All 36 wearers to this point have volunteered. In one case, however, the wearer felt the camera was uncomfortable, apparently due to hair accessories. The student removed the camera and his partner agreed to wear it. I understand that *some students may not want to participate*, and I imagine that those less eager to wear the camera would not volunteer early in the course. Should that situation arise, I will ask another student to volunteer, one to volunteer for a second time, wear the camera myself, or refrain from recording that class meeting.

Finally, there are *a number of steps required* to successfully record and organize files. The camera must be set properly — with charged batteries and an empty memory card — and turned on. Turning on the camera is simple, but once I noticed that the camera was not on. The video files, which require approximately 4GBs per hour of recording, need to be copied to a hard disk and organized by course and class meeting. None of these tasks are odious, but they do take time and organization.

GoPro applications

In the first 9 weeks of collecting classroom data using the GoPro camcorder, I have developed a variety of procedures, activities, and materials made possible by the unique perspective it provides. A sampling of those is provided here:

Showing the first GoPro clip

The first recording that I used in freshman OCS2 classes was of my GoPro introduction. At the beginning of the class, I had turned the camera on and initially placed it on the podium facing me. Later, as I was giving the introduc-

tion, I put the camera on my head and continued my explanation. One benefit of using the introduction as the first clip to show students is that I am the subject of the clip, not one of the students. I could have used footage from the first volunteer, but I thought focusing on myself would help students to feel more comfortable with the camera while better understanding its purpose, what it captures, and how it may be used.

For OCS4, partially because they are sophomore students and partially because they have positive rapport, I was comfortable bringing a 2-minute recording of a skit, *meeting a friend for the first time in couple months* (Photo 4). This was the first example of a language-learning task captured and subsequently returned to the class. No materials were created to accompany the video and students simply watched it to become familiar with what the camera captures.

Photo 4:
GoPro recording during a skit

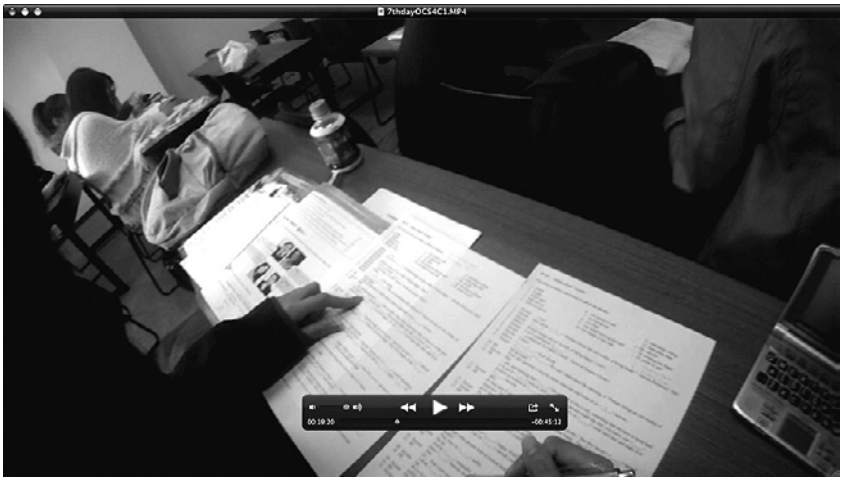
GoPro video and accompanying materials

The first instance of using student language captured by the GoPro camera back to a class as print materials was a section from approximately the last minute of my explanation through 2 minutes of a conversation task. This resulted in a transcription comprising a several lines of my explanation and then ¾ of a page of their conversation. It provided a number of learning points, including both linguistic and strategic foci (see Appendix 1).

Because of the visual aspect of GoPro data, I was able to look at not only what is being said, but at what participants are doing. For day 4 of OCS4, I decided to introduce this novel use of GoPro footage by focusing my use of gesture

Video capture 4: Student view of teacher's explanation

and expression. I extracted a 3-minute excerpt of my explanation of the word "worthy" — a vocabulary item in the textbook — during individualized teacher to student instruction (Video capture 4). Because the second class, OCS4•D, had also asked about the word, I used the OCS4•C clip for both sections — the first time I had done so with GoPro excerpts (Appendix 2). Students seemed actively engaged in trying to match the gestures and expressions listed at the top of the handout with when they occur in the transcription, especially with the help of a partner (Video capture 5). Besides bringing attention to nonverbal aspects of communication, this procedure also provided students with a number of useful expressions for talking about the topic. I got the impression, however, that OCS3•C was more active and interested in the activity than OCS4•D. There may be several reasons for this, and possibly these could be explored in future studies, but it appears that there is greater interest in recordings from students' own classes, which, being of their actual production, is set in their Zone of Proximal Development (ZDP) (see de Guerrero & Villamil, 2000; Vygotsky,



Video capture 5: View of GoPro-derived collaborative activity

1978), making it easier to access and engage in.

In retrospect, the activity and materials may have been more effective had I limited the number of gestures and expressions. This is something I considered in designing subsequent materials using a 2-minute clip from student conversations. I was able to combine the use of the GoPro camera with IC recorders during the freshman OCS mid-term Group Conversation Exam (GCE). Because I had both a video of the chosen excerpt and a clear audio recording, I was able to pinpoint student gesture and expressions in the transcription (Appendix 3).

Future directions

There are many possible directions the GoPro study can take. By the end of the semester, I hope to have sixty 90-minute recordings offering a wealth of information and potential research avenues. I intend to use NVivo 9 (Richards, 2010), a type of Qualitative Data Analysis Software (QDAS), to aid in organizing and analyzing this relatively large amount of data that will include the

video files, photographs, IC and video recordings, a teacher journal, and student feedback.

Some possible areas for further study correspond with those I considered before using the camcorder in classes. These include: 1) exploring ways to address the challenging task of aligning teacher and student expectations, 2) involving students more in analyzing clips, perhaps meeting with them outside of class time, 3) designing in-depth questionnaires and conducting interviews to clarify student experience, 4) exploring the effect of the camera (Photo 5) as, for example, another teacher presence, and 5) documenting how the camera can promote *concurrent self-reflection* in the teacher, as he or she recalls insights gained from the videos in real-time in subsequent classes.

Photo 5:
The effect of the GoPro camera

Final thoughts

Although there are a number of issues related to its implementation — including cost, logistic concerns, student comfort, place in the larger curriculum, and integration with other technologies (Photo 6) — there is great potential for new insights from this innovative camcorder, particularly from the participant perspective it provides. As with all innovations, there will be a period of experimen-

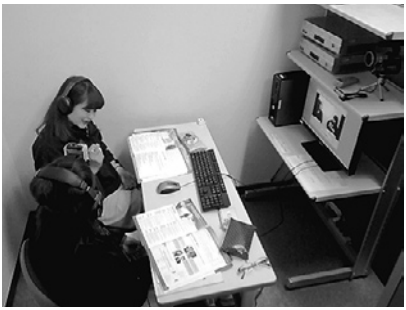


Photo 6: Integrating GoPro with other technologies

tation and development leading to more efficient and effective methods. My impression is that the GoPro head-held camcorder can lead to new possibilities in collaborative learning, materials development, student motivation, teacher education, and other areas of classroom research. I expect it — and future, more-lightweight versions with improved audio capture — to become a staple among educators' observational and developmental tools.

Appendix 1

OCS4•C Day 2 Health

PK: …very small portions of meat and convenience foods. Really? How often do you guys eat convenience store food, I wonder. But it says here, very rare that people eat a lot of meat or convenience store food. Maybe that's changing. Anyway, some ideas that maybe you can talk about today with this new partner that you are sitting with. I'll give you about 10 minutes. Let's try again to talk a little bit more freely about diet. Go ahead you guys.

A: More freely… Do, do, do you think, what food is healthy?

_____

M: Ah. Mm. I think, soybean is very healthy, because, um…
<checks dictionary> _____
…it have not, uh, uh, sorry, "carbohydrate," so it's, it is good for our health. Have not, uh, high, uh… It's low calorie. _____

A: Mm-hm.

M: It's good to lose our, our weight.

A: Ah.

M: So, I like it.

A: <nods> _____

M: How about you? What do you think about healthy food?

_____

A: I think, mm, mm, so, something, uh, used soybeans, so for example tofu, or *natto*, or *tonyu*. _____

M: Mm. I see.

A: It's, I think it's healthy food.

M: Do you like it?

A: Yeah. Uh, uh, do you… Uh, can you, can you drink *tonyu*?

M: Yeah, but, uh, natural, natural *tonyu*…

A: Ah!

M: …is not good for me. But, oh. Is it sweet? Ah, sweet. Ah, it's a lot of variation of taste…

_____

A: <nods>

M: For example, strawberry…

A: Ah!

M: …and tea, green tea. I like them.

A: Ah, yeah, yeah. Recently, a lot of kinds of *to, tonyu*, soybean milk is, was released. So, I think… I… People who don't like *to,* soybean milk, makes it easier, easier to drink…

Appendix 2

OCS4 — Asking about "worthy"

•Use these gestures and actions to fill in the blanks:

1. points
2. laughs
3. raises hand
4. indicates up
5. indicates down
6. two hands to self
7. two hands out
8. two fists
9. two hands moving forward
10. two hands to one side
11. indicating writing
12. indicating other
13. indicating higher
14. indicating lower
15. one fist
16. twirling one finger
17. points to self
18. points to self

1.	Sayana	…I see.
2.	Satomi	How about, <_____> "Human beings are not worthy of being happy." <checks dictionary> Hm?
3.	Sayana	<_____>
4.	Satomi	Human beings are not worthy of being happy. I don't…
5.	Sayana	I can't understand. <_____>
6.	Satomi	…understand. So I didn't check. <looks at Sayana's book>
7.	Sayana	Unsure.
8.	Satomi	<_____> Prof. Kindt.
9.	Sayana	<_____> <_____> We can't understand the meaning of "Human beings are not worthy of being happy."
10.	PK	Yeah, that question is maybe about someone that believes in <_____> heaven…
11.	Sayana	Mm.
12.	PK	…um, and thinking that <_____> life on earth is like a test, something that we have to work hard at to get to <_____> heaven, and <_____> that person might say that, you know, our <_____> purpose as humans is <_____> not to be happy. It's to <_____> work hard and, and make it to <_____> heaven.
13.	Sayana	Mm.
14.	PK	So then they'll say, <_____> "human beings are not worthy," that they haven't <_____> earned happiness. They haven't <_____> worked to

become happy. They'll be happy if they <_____> go to heaven.

15. Sayana Ah.
16. Satomi <turns to Sayana> <Prof. Kindt notices>
17. PK <gives more explanation> Do you know… "Worthy" means you've <_____> earned something. For example, um, your TOEFL score <_____> needs to be 450 or <_____> higher <_____> to graduate…
18. Sayana Mm.
19. PK …so if you have a <_____> higher TOEFL score <_____> than 450, you're <_____> worthy to graduate. You've <_____> earned your graduation right.
20. Sayana Mmm.
21. PK Though some people believe human beings don't have a right to be happy.
22. Sayana Really?
23. PK They have to <_____> suffer.
24. Sayana Ha ha.

Appendix 3

OCS2•D Group Conversation Exam excerpt: Group 2

Write the strategy (hint) on the line next to where they are used:

1. confirmation
2. giving examples
3. having fun
4. interjection
5. interrupting
6. intonation question
7. self correction
8. shadowing
9. suggesting a word
10. using synonyms

1. Natsuki Uh, this year…
2. Nana Yeah.
3. Natsuki …*nashi*…
4. Nana *Un.*
5. Natsuki …is very expensive.
6. Nana Expensive, _____ uh-uh. I think so, t… Yeah.
7. Natsuki So it, I ate little. [?]
8. Nana Mm-mm. You don't like *kaki*? _____
9. Natsuki Yes. [*How do you answer a negative question in English*?]
10. Nana Japanese fruits.
11. Natsuki Yes. You like…
12. Nana *Kaki*. _____ <laugh>
13. Natsuki <laugh> _____
14. Nana Yeah, I like *x*.
15. Natsuki Yeah, so you often eat *kaki*?
16. Nana Yeah, yesterday, yesterday, I ate *kaki*…
17. Natsuki Oh.
18. Nana …at supa, supper. _____
19. Natsuki Do you like only fresh *kaki*?
20. Nana Mm, yeah, only fresh, raw, raw… _____
21. Natsuki Mm.
22. Nana *Kaki*, yes. <laugh>
23. Natsuki <laugh> Ah. Mm, in this spring vacation…

24. Nana *Un*, spring vacation.
25. Natsuki I know you _____ go to New Zealand…
26. Nana Uh, New Zealand, yeah. _____
27. Natsuki What do you think _____, uh, food, food…
28. Nana Food.
29. Natsuki …in New Zealand? Uh, very…
30. Nana I worry about food. _____
31. Natsuki Ah.
32. Nana So… I can't eat mayonnaise…
33. Natsuki Ah!
34. Nana …but, I think people…
35. Natsuki Oh.
36. Nana …in New Zealand seems _____ like mayonnaise.
37. Natsuki Really? _____
38. Nana Mayonnaise, sandwich, or…
39. Natsuki Ah.
40. Nana …hamburger, like, potates and… _____

Notes

1 GoPro® is a registered trademark of Woodman Labs, Inc., used with permission.

References

Beck, C., & Kosink, C. (2006). *Innovations in Teacher Education: A Social Constructivist Approach*. Albany, NY: State University of New York Press.

de Guerrero, M. C. M., & Villamil, O. S. (2000). Activating the ZPD: Mutual scaffolding in the L2 peer revision. *The Modern Language Journal, 84*(1), 51-68.

GoPro. (2010). Retrieved November, 13, 2010, from www.gopro.com

Hindmarsh, J., Heath, C., & Luff, P. (2010). *Video in Qualitative Research*. Los Angeles: SAGE Publications.

Kindt, D. (1997). *Understanding instructions survey: Less anxiety, more interaction.* Paper presented at the On JALT96: Crossing Borders.

Richards, T. (2010). NVivo 9. Melbourne: QSR International. Retrieved November, 15, 2010, from www.qsrinternational.com

Vygotsky, L. S. (1978). *Mind in Society: The Development of Higher Psychological Processes*. Cambridge, MA: Harvard University Press.