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Back-Pocket Journalism: What an Experiment in "Mobile-Only" Newsgathering Taught My Students—and Me

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Abstract:

In a multimedia journalism class, students were challenged to go "mobile-only" for six weeks. The students, juniors and seniors in the magazine and news-Internet sequences, were armed with a smartphone or iPod Touch loaded with apps with which to do all their newsgathering. They used the devices to take notes; shoot and edit photos and video; gather and edit audio; upload content to the class news site; livestream, liveblog or tweet an event; interact with audience; and even monitor police scanner traffic. The six-week unit had only one rule: no pens and paper, no cameras or audio recorders other than those on the smartphone, no laptop or desktop computers, and no software that wasn't available as an app. The goal was to test the limits and potential of the smartphone as a sole newsgathering device and to acquaint students with preparing content for mobile consumption. At the end of the unit, students showed significant growth in their technical and multimedia abilities and in their understanding of what the mobile devices could and couldn't achieve. Students also reported higher levels of engagement, collaboration, risk-taking and urgency in their newsgathering. They also reported feeling better prepared for the demands of the profession.

Part 1:
Trends in Mobile Proliferation and Consumption

"Back-pocket" journalism is displacing "backpack journalism" (Briggs, 2013, p. 115). The increasing sophistication and affordability of smartphones means reporters can hold in one hand a full multimedia suite of reporting and editing tools. In a smartphone, they have everything they need to prepare text, photos, video, and audio; to publish content to a website or blog, or to social media; and to interact with audiences.

Journalism students and their teachers should anticipate and prepare for an explosion in demand for news and information on mobile devices. The iPhone didn't exist until 2007, the iPad until 2010, yet nearly half of American adults now own a smartphone, and one in five owns a digital tablet (Mitchell, Rosenstiel & Christian, 2012). By the end of 2012, there will be nearly 116 million smartphone users in the United States, and nearly 55 million tablet users ("Women More Likely," 2012). Smartphone ownership is even higher among younger people. Sixty-two percent of 18- to 24-year-old mobile consumers own a smartphone; 66 percent of 25- to 34-year-olds do ("Survey: New U.S. Smartphone Growth," 2012).

This explosive growth is changing how Americans find and consume news and information. They spend more time on their mobile phones and tablets each day (65 minutes) than they do reading print newspapers and magazines combined (44 minutes)("Mobile Passes Print," 2011). In 2010, Business Insider

marveled when the number of downloads of the New York Times iPhone app hit 3 million, nearly twice the Times' Sunday print circulation (Reagan, Feb. 10, 2010). But that was just the beginning. By 2012, the Times iPhone app had been downloaded 14.9 million times, and the iPad app, 3.6 million times (Johnson, 2012). Analyst Kannan Venkateshwar estimates that the Times will have more digital subscribers than print subscribers by early 2014 (Kafka, 2012b).

The trend is clear. Publishers must go where the audience is—and the audience is now everywhere. Students now need experience in both producing and consuming mobile content if they are to be adequately prepared to tell stories across all platforms and if they are to thrive in a competitive industry. Journalism students should be immersed in the mobile world of smartphones and tablets. They should be comfortable and savvy about consuming content via smartphone and tablet so that they understand user experience. They should at least be exposed to app creation. And they should be proficient at creating multimedia content using a smartphone or tablet.

Many news organizations are already pursuing mobile newsgathering. Thompson Reuters has been a pioneer since 2007, even before the first-generation iPhone was released, working with Nokia to tailor mobile phone software for reporters' use (Quinn, 2009). Reuters first tested mobile coverage at New York's fashion week in June 2007 (Kiss, 2007). In early 2012, Gannett Corp. bought iPhone 4Ss and data plans for its reporters and trained them in how to use the iPhone for mobile reporting (Sonderman, 2011). Philadelphia Media Network, owner of the Inquirer and Daily News, has done the same (Jordan, 2010). Neal Augenstein, a reporter for WTOP radio in Washington, DC, has been using only an iPhone since 2010 to capture and edit video, photos and audio and to post breaking news to Twitter (Augenstein, 2011). Reporters at the *Orlando Sentinel, Chicago Tribune, San Francisco Chronicle,* and *Harrisburg (Pa.) Patriot* shoot video using smartphones and post it to the Web (Powers, 2012). The BBC even developed its own iPhone/iPad app for reporters to file video, photos and audio from the field directly to the BBC's system (Gunter, 2011).

Coverage of the 2012 Summer Olympics in London generated an avalanche of mobile coverage. For example, *Washington Post* reporters used SocialCam to record interviews and live action at the Games and publish via social media networks (Isaac, 2012). Olympics fans devoured NBC's video stream, with about 40 percent of 64 million streams the first six days going to mobile devices, rather than to desktop or laptop computers (Kafka, 2012a). Instagram users posted more than 100,000 photos from the Olympics in London (Laird, 2012).

Generating content for mobile consumption is now a job responsibility of a growing number of entry-level journalists. In 2011, 8.5 percent of journalism and mass communication graduates who had a bachelor's degree and were employed said they produced content for mobile devices (Becker, Vlad & Kalpen, 2012). That may not sound like many, but it's up from just 1.6 percent in 2006 and 4.3 percent in 2009. Based on industry trends, it's safe to assume that number will spike in subsequent surveys.

Mobile know-how is an increasingly desired professional skill. In 2009, Vadim Lavrusik, then a graduate student at Columbia University and now the journalist program manager at Facebook, wrote: "Reporters need to focus on primarily gathering information and how to present that information in multiple formats: websites, mobile platforms, social networks and finally print" (2009). The Society of Professional Journalists surveyed its members in 2011 to learn what types of training they most wanted. Training in reporting for mobile devices was No. 3, behind training in social media and website building (Wenger, 2011). As the industry moves toward mobile newsgathering, journalism curricula should, too.

Part 2. The "Mobile-Only" Unit in a Multimedia Journalism Course

In September 2010, I bought my first smartphone: a Motorola Droid X. Its potential as a platform for newsgathering, publication and audience interaction was obvious within a few weeks of my using it, and I began thinking of how to incorporate mobile into the spring 2011 Multimedia Journalism course.

Multimedia Journalism is required of all news-Internet majors. Students in other journalism majors may take it as an elective. Students enroll in it in their junior or senior year. Typical enrollment is 10 to 12, and it is offered in the spring semester only. The course was introduced in 2009, replacing a semester-long newspaper print-design course. Its objective is to provide students who are typically more print-focused with the multimedia skills needed to produce content for news and magazine digital platforms.

Early in the semester, students learn the basics of shooting and editing photos and videos; gathering and

editing audio; and creating slideshows. They use easy-to-learn, consumer-level, point-and-shoot cameras (Canons), video cameras (Canon ZR800 or ZR900) and audio recorders (Tascam DR-07 and Zoom H4), rather than sophisticated, high-end multimedia gear. Except for Photoshop, they use consumer rather than professional apps, such as GarageBand and iMovie. Soundslides is the software used to create slideshows. Students post their audio slideshows and short video stories to the Web.

In spring 2011, when I first introduced mobile into the class, smartphones weren't as pervasive as they are now. I received a $2,000 grant from the university, under a program to encourage the use of digital technology, to buy six iPod Touches for student use. The iPod Touch does almost everything an iPhone does, except make and receive phone calls. This purchase avoided committing the school to an expensive voice and data plan. The disadvantage, of course, is that the Touch must be connected to a wireless network to connect to the Internet, since it doesn't have cellular connectivity. The university has campuswide wi-fi, so that wasn't much of a problem. For off-campus use, students used a MiFi mobile hotspot owned by the journalism school and available for student checkout.

In spring 2011, the first experiment with the mobile newsgathering unit, the iPod Touches were a necessary investment. In that class, only 3 of 10 students had smartphones. By spring 2012, however, 10 of 12 students had smartphones, and six of those were iPhones. Even then, the iPod Touches were a useful addition, allowing students to compare the Apple and Android operating systems and available apps.

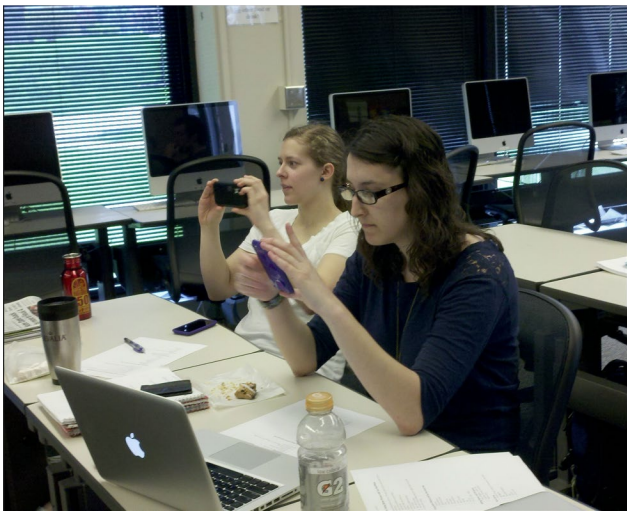
With iPods or their own smartphones in hand, students in spring 2011 and spring 2012 spent the last six weeks of the semester in Multimedia Journalism exploring "mobile-only" reporting, multimedia gathering and editing, and publishing. There was only one rule: They could use only a smartphone to take notes; shoot and edit photos and video; gather and edit audio; and publish to a website or blog or via social media. No laptop or desktop computers. No traditional cameras, video cameras or audio recorders. No reporter notebooks (although we bent that rule a little). No software that wasn't available as an app. The challenge was to use only a smartphone, rather than a full complement of multimedia gear, to produce multimedia content that was at least adequate in a breaking-news situation.

The objectives of the mobile-only unit stated that students would:

1. gain technical proficiency with using mobile devices for reporting, producing multimedia, publishing, and interacting with audience, so that they can use them in the field to cover breaking news;
2. monitor and analyze how mobile tools alter their story selection, reporting, and presentation;
3. develop troubleshooting and self-teaching skills, enabling them to fix problems, find answers to questions, and adjust to advances in mobile technology;
4. emerge with a new "journalistic mindset" that embraces digital and mobile technology, immediacy, urgency, deadlines, and risk.

As an introduction to the unit, we examined the trends in mobile's explosive growth; the adoption of mobile strategies by news organizations; and the growing importance of immediacy and urgency in news coverage. I tried to make our expectations realistic by telling students that they would not achieve documentary-quality content like "Frontline" or NPR, but that when speed is of the essence, the content produced could be "good enough." Knowing the limits of the mobile devices, we set a goal to produce the highest quality content that was possible with them.

Extensive preparation and hands-on practice with the mobile devices and with appswaskey to student success with mobile newsgathering. Students spent three weeks learning how to get the most out of their phones' cameras and how to edit photos; how to shoot and edit video; how to gather and edit audio; how to store and share files; and how to post



Students familiarize themselves with apps on a smartphone and iPodTouch.

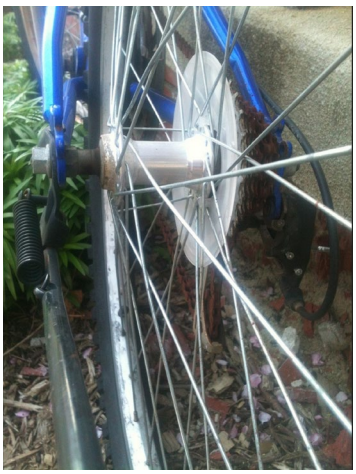


Photo scavenger hunt. "Wheels," shot with ProCamera app.

to various publishing outlets. They explored the best free or inexpensive apps to accomplish these tasks, including Audioboo, iMovie, PS Express, SoundCloud, Ustream, Qik Video, ProCamera, police scanner apps, Instagram, Dropbox, Evernote, WordPress, Flickr, Tumblr, Twitter, Facebook, and YouTube.

The students' in-class work was often unpolished and sometimes even silly, as they worked through their uncertainty and self-consciousness. But the point is for students to make the embarrassing mistakes in class and conquer their self-consciousness before working more professionally in the field covering actual stories.

An example of an early in-class unit assignment was an on-campus photo "scavenger hunt." Working in pairs, students had 45 minutes to interpret, find, photograph, edit, and post items on a quirky 26-item list, such as "heritage," "silence," and "mess." They experimented with the ProCamera, Instagram and PS Express apps, and posted to Tumblr, Flickr, or a WordPress blog. After 45 minutes, students gathered to view and critique each other's work. [Flickr photostream]

In another assignment, students posted a brief audio autobiography, using Audioboo to record, add a photo and geotag, and post to Twitter.

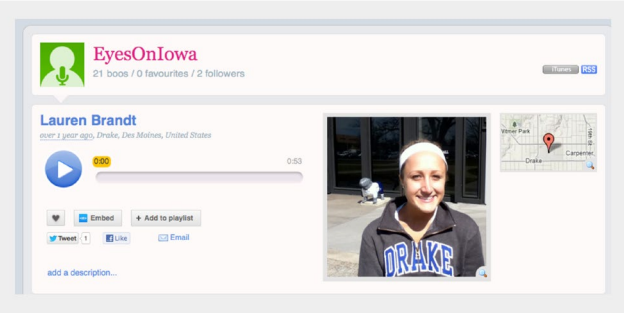
To gain more audio practice, students conducted brief "person-on-the-street" audio interviews on timely topics.

To practice shooting and editing video, students again interviewed each other and again conducted "on-the street" interviews about current events and issues. They used the iMovie app to edit the video and posted the edited video to a WordPress blog, YouTube, or Tumblr.

In-class exercises like these prepared them for the main event: "live" mobile-only coverage of community events and entertainment leading up to the annual Drake Relays track meet. The Relays draw thousands of athletes, coaches, and spectators in late April and engage much of the local community in the 103-year-old tradition.

Mobile newsgathering is, of course, best-suited for breaking news or for a developing story of immediate and wide public interest, such as a crime, accident, or natural or manmade disaster. The challenge in the classroom is to replicate that sense of breaking news. Our imperfect solution was to produce live coverage of the Relays activities, which is admittedly artificial but is as close as we could come to simulating a breaking-news experience.

All students in the class contributed to producing live team coverage of the annual Drake Relays Beautiful Bulldog Contest. (The university's mascot is the bulldog.) The popular pageant selects the canine mascot for the Relays from among 50 bulldog entrants, many of them costumed as brides, ballerinas, superheroes, fairies, and even food.

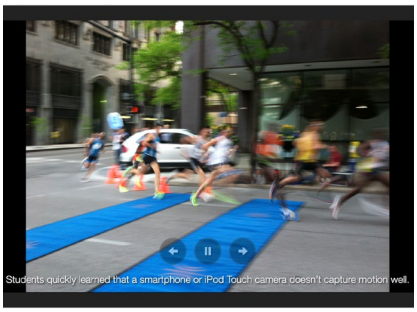


A student interviews another student at the university.

Working in pairs or trios, students were also required to produce live coverage of one other event that week: the downtown streetpainting, in which corporations and organizations paint Relays-themed squares on the sidewalk in a popular entertainment district; "pole vault at the mall," in which the Relays' top male and female pole-vaulters compete inside the atrium of a suburban mall; or the Grand Blue Mile, a series of one-mile races downtown for people of all ages and athletic abilities, ranging from children and families to elite athletes.

Students planned their coverage of the events, divvying up duties and assigning specific tasks. Their coverage of the events consisted mainly of photos and captions and short videos. The bulldog beauty pageant was livestreamed.

Students posted their ongoing coverage to Tum-



Students quickly learned that a smartphone or iPod Touch camera doesn't capture motion well.

blr. The campus newspaper, the *Times-Delphic,* embedded the Tumblr feed on a special "Relays Live Coverage" page.

One student with an iPod Touch shot video of another student attempting to interview a bulldog and its owner. Students shot video of the pageant itself and livestreamed it via Ustream. A student used an iPod to record and edit a video interview, including the addition of lower-thirds. Using an iPod Touch, students recorded an introduction to their coverage of the downtown streetpainting and posted it to Tumblr. [These and many other examples were embedded in the original article; some were lost to linkrot, others could not be ported over to the new TJMC website.]

Students even assembled a video slideshow depicting the time-lapse completion of a painted square – music included. This was compiled after the event, using a laptop computer and iMovie.

Using an iPod Touch, students shot, edited, and posted videos of pole vaulters competing at the mall. The limits of the iPod Touch are evident when shooting sports. The iPod is susceptible to camera shake and lacks a video zoom. Yet it was sufficient to capture this superb vault and the ebullience of the athlete and crowd. Another student shot, edited, and posted a video of an interview with the women's pole vault winner. Even without an external mic and with a noisy environment, the audio was sufficient.

Photo of downtown streetpainting, taken with smartphone

In the final week of class, students viewed and critiqued the coverage; shared lessons learned; analyzed how mobile newsgathering changed the way they reported; and identified ways to apply what they learned in successive classes, internships, or jobs.

Part 3. Student Outcomes

Student learning was measured through grading of assignments, a pre- and post-survey, and an open-ended qualitative questionnaire.

Overall, although some students were apprehensive at first about going mobile-only, they reported satisfaction with the unit.

- "It was a little strange at first to be relying solely on one device."
- "I was kind of wary at first, but this was the best unit we did all semester—the most helpful and practical."
- "It was amazing to see how much we could accomplish on just an iPhone with a few cheap apps."
- "I thought going 'mobile-only' was going to feel a lot more unnatural than it did. I thought I would feel awkward without my pen and notepad and recorder and small microphone and point-and-shoot camera and extra batteries. … But then, once I got into the groove of the event I was covering, I forgot about everything else I would have normally brought. It might sound cheesy, but I felt like a little weight had been lifted."

More specifically, significant learning outcomes were identified in four key areas:

1. Technical and operational proficiency with the mobile devices and apps;
2. Adaptations in how students practiced journalism;
3. A new mindset that embraced a journalism of immediacy, urgency, deadlines, and risk;
4. A greater confidence in students' preparedness for a career.

Technical and operational proficiency

In the spring 2012 semester, students were surveyed before and after the mobile-only unit about their proficiency with mobile apps for reporting, for gathering and editing media, and for publishing. In the pre-survey, no student reported proficiency in any category. By the end of the unit, 66.7% reported proficiency

Rate your proficiency with:	1 = know nothing or very little	2	3 = proficent
Mobile apps for reporting (note-taking, document scanning, file storage, etc.)	Pre: 66.7% Post: 0.0%	33.3% 33.3%	0.0% 66.7%
Mobile apps for gathering and editing media (audio, photos, video, streaming)	Pre: 75.0% Post: 0.0%	25.0% 11.1%	0.0% 88.9%
Mobile apps for publishing (Posterus, Tumblr, WordPress, Ustream, CoverItLive)	Pre: 50.0% Post: 0.0%	50.0% 0.0%	0.0% 100.0%

with reporting apps; 88.9% reported proficiency with media apps; and 100% reported proficiency with publishing apps.

Students also quickly and correctly identified the technical advantages and disadvantages of the mobile devices:

- "Some lighting situations made it difficult to accurately capture images or video. And many times, due to the placement of the microphone or the amount of background noise at the event, it was difficult to record useable audio."
- "Though the sound we gathered was nowhere near as good as it would have been with a directional microphone and more sophisticated equipment, I was impressed by the quality of audio we gathered."
- "It was a lot harder to get a clear photo because the events that I covered had people and animals constantly moving. With an SLR, it's easier to capture a clear motion-picture, but it definitely is not with a smartphone."
- "If I had to pick any kind of equipment I missed, it would be a microphone, because people connect the microphone with where to direct their voice, and I think it makes them feel more comfortable than speaking to someone holding up a phone."
- "The quality of audio, video and photographs might not have been perfect. But you do capture things quickly and get into the habit of shooting something and uploading."
- "My iPhone had everything I needed. I could snap photos quickly—focus, crop, edit them—and then upload in seconds. I could record video and edit it with just my fingers. I could record audio, Google a reference, type up a quote. I could check our reporting through Twitter and Facebook and Tumblr. My phone really had everything I need."
- "We definitely could take photos more quickly, just point and shoot. The iPhone can automatically focus, and I could crop and edit very easily. … I was surprised by my phone's ability to take almost macro photos—very close up, focused ones. Audio was simple, too."
- "There was definitely an increased necessity in paying attention to details such as placement and lighting when it came to taking photos."
- "Although people are forgiving about the stabilization of videos, I feel it's crucial to be as stable as possible. I found myself wishing for a tripod."

Adaptations in how students practiced journalism

Some students also thoughtfully considered how mobile newsgathering changed how they behaved as reporters and how they planned their coverage:

- "I found myself making sure that I was asking questions that could be turned into good sound bites or short video clips."
- "I focused on what would instantly put the readers at the scene."
- "I asked very 'to-the-point' questions and didn't use too much time building rapport with the person/people, because I focused on getting to the point of the story right away."
- "Working with mobile devices almost pushed me to report more because there was an immediate product."
- "Overall, the tone of coverage was much more informal."
- "The hardest part was making sure that we weren't just picture-vomiting on the website, and making sure we were telling some sort of story."
- "I was a lot more focused on images that could encompass a large deal of information, though only using a few words, and paid much more attention to details than I would have otherwise."
- "I relied more on visual journalism like photos and videos. … Since I was more focused on the visual, it definitely affected who I interviewed or covered because I was unconsciously searching for what was visually appealing, and that could be a weakness."

- "My focus was on the visuals. As a newspaper journalist, I've never catered to visuals so much. I had to change my mindset."
- "It makes you lean more toward the side of 'be first' rather than 'be the first to be right,' and that can be dangerous."

Some students reported feeling as though they weren't taken as seriously as journalists when reporting with a mobile device. But others said the devices were less intrusive and put sources and interviewees at ease.

- "People are definitely apprehensive about answering questions when you're just holding a phone up during the interview. It's almost as if they question your credibility because you aren't carrying around the heavy, expensive equipment like many other professional reporters do."
- "I did find that people seemed to give me strange looks when I asked if I could record them and take their picture on my personal phone."
- "At first it was a little disarming to approach people with only my phone in hand, but I soon found that because the people I was interviewing were more comfortable, that I was, too."
- "People were slightly leery at first about who I was and what I was really doing, but once I had explained myself, they seemed to ease up."
- "Surprisingly, people were all for taking me seriously with my pocket-sized equipment. They didn't act any different, so I didn't feel any different."
- "It's less intimidating for them to only have an iPod Touch in front of them instead of a recorder or camera. I think it relaxes them, and that makes your job easier."

A new mindset that embraced a journalism of immediacy, urgency, deadlines and risk

Although they didn't cover "real" breaking news live, students nonetheless reported a greater sense of immediacy and urgency and of working against a constant deadline of "now." At least one student didn't like the greater pressure, however.

- "I felt more of a responsibility to post my coverage right away because I had the ability to do so."
- "It made me feel more pressured. When videos didn't upload, I freaked out. When apps crashed, I panicked."
- "Mobile journalism made me think on my feet."
- "It certainly encourages us to get information out in a quick but still professional manner."
- "It reinforced the notion that we need to be ready to adapt and communicate in different ways and be as quick and interactive as we can."
- "We needed to act fast and break the news. Our audience didn't want to read about something that already happened; we were talking about the present, 'right-now' action."
- "I felt this adrenaline rush whenever I posted a picture on Tumblr. I even remember saying to myself, 'Hurry up! Load! This needs to get on there!' There really was not a significant rush at the events we covered, but I still had that feeling of urgency when publishing content."

One of the unit's objectives was a bit more difficult to assess: a shift in journalistic mindset toward a willingness to take risks and fail; to collaborate with and learn from others; and to take the initiative to experiment.

- "I took more initiative when working with the mobile devices because I had all of the technology I needed in the palm of my hand."
- "Our failures taught us more than our successes."
- "One of the things that I really enjoyed was being able to see the work that other people were doing right away – I think that that was one of the most valuable experiences."
- "I definitely felt more comfortable using these devices than the more sophisticated equipment. It is much easier to take risks and try new things when you aren't surrounded by a ton of bulky technological equipment."
- "With the technological advancements, journalists, of all people, need to be using and experimenting with mobile applications."
- "I'm the kind of person that is nervous to try new things, so this was a challenge for me. But it was motivating and I found it easy to want to learn more."
- "I felt comfortable and confident taking risks, even if I failed. … I didn't feel as bad discarding things that weren't useful."
- "It's fun to go mobile. You get kind of in a 'wing-it' mentality and do the best that you can with what you have."

A greater confidence in students' preparedness for a career

Finally, students reported an increased confidence in their ability to cope and adapt in the profession.

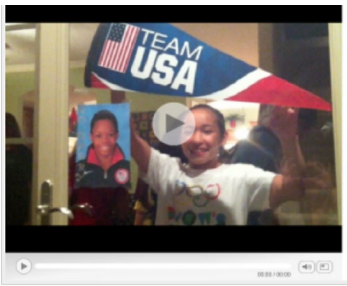
- "Definitely gave me a different outlook on how journalism is evolving as a profession. There is no longer time to go through multiple drafts and

edits of a story before it is printed or posted to the web, and I think that things like live-blogging and Twitter have really come to accentuate that."

- "I definitely feel more prepared and adaptive within the industry, having worked with a wide variety of mobile platforms and applications. I also believe that the process is ever-changing and evolving, so it is important to always be learning new technologies."
- "I can show employers that I can think on my feet, that I am flexible and that I know the basics of good journalism, no matter what equipment I have to work with. Experimenting with mobile journalism is also a great way to practice becoming a more well-rounded journalist. The field of journalism expects us to be able to do everything, and with a device that fits right in our pockets, we have the ability to do everything."
- "Interviewers are always intrigued when I talk about these experiences, and ask to see the work we produced."
- "I definitely feel more prepared and ready to go forth in the journalism world. I learned valuable skills, and learned how to use my iPhone in practical ways. … I understand the limitations and rules, what works best and how to succeed."
- "It made me feel more well-rounded, and I can say that I'm adapting to how communications is changing."
- "I learned and was trained the traditional journalism way. … I am now more well-rounded and skilled as a journalist. I can offer many different talents and approaches to stories."
- "I felt very tech-savvy, and like I am ahead of the curve, knowing how to successfully go mobile."

One other measure of the mobile-only unit was student's immediate application of what they learned to their internships and other classes. For example, one student interning with the local newspaper shot iPod Touch video of tornado damage in a western Iowa town.

Two students shot video of the spring 2011 political protests in Madison, Wisconsin. (However, the video editing was done on a laptop.)



Two students interning and freelancing for Patch shot video of an Olympics viewing party, as a local gymnast competed for, and won, a gold medal.

A student who is in ROTC shot videos and photos of a weekend field training session and posted them to the unit's blog. This example underscores the difficulty of gathering good audio on a windy day.

Part 4: What I Learned – and What I'd Do Differently

An undertaking this experimental is bound to come with its share of frustrations and unexpected glitches, some technical and others pedagogical. Colleagues considering such an undertaking might consider the following:

Technical considerations

Accessibility of gear. Not all students will own a smartphone and, with higher-education funding tight, few faculty are likely to persuade their universities to buy the necessary gear. At the private, four-year university where I teach, more and more students own smartphones with data plans, but that is unlikely to be the case everywhere. One solution might be to pair up a student without a smartphone with one who has one.

If faculty or their students are looking to purchase a device, one cost-saving solution is to look for slightly outdated gear. I bought my iPhone 4 for $100, when Apple was looking to unload old products to make room for the iPhone 4S, which costs $199 to $399. As of mid-October 2012, after the release of the iPhone 5, Apple was literally giving away the 8GB iPhone 4 (with a two-year wireless service plan). It was selling the 4S (16GB) for $99.

Even if students do own smartphones, they may have so much music, or so many stored photos and videos, that they don't have storage left for multimedia apps and large media files.

Account and password management. Creating and maintaining multiple accounts was an unanticipated logistical headache. If you are using school-owned equipment, plan ahead about who will inventory the devices, set them up, sync them to Apple or Google Play accounts, set passwords and monitor checkout. If students are publishing content to YouTube, WordPress, Flickr, Twitter, Audioboo, etc., whose accounts are they using? How widely shared is the password, and what security challenges does that present? I created a Gmail account for the course, then used that email address to create accounts with a common password that was shared with students. At the end of the unit, I changed the passwords.

Another unanticipated account security issue was that students often logged into their personal Twitter or Facebook accounts on a school-owned device, but didn't log themselves out, giving the next user access to their private accounts. Fortunately, all "hacks" were benign.

Wireless network strength. Students are at the mercy of whatever wi-fi network they're on or, if using a mi-fi mobile hotspot, the strength of the cellular signal. Signals can be weak if you're in a remote area, or if several people are camped on it. A mobile hotspot that operates off a 3G cellular signal can get bogged down quickly if many are using it, especially if they're uploading large media flies. We noticed that, even in our classroom, when several of us were connected to the university's wi-fi network uploading media, the connection slowed noticeably.

Limits and unreliability of apps. We learned the hard way of Tumblr's daily limit of 75 photo postings. To adjust, we moved to Flickr, which allows 300 MB of photos to be posted each month. Sometimes Twitter goes down, or WordPress hiccups, or the Ustream feed crashes, or the iPod battery dies. Happily, students always seemed to find a solution or a workaround for the problem. For example, during livestreaming of the bulldog pageant, students quickly realized that livestreaming video is a significant drain on a phone or iPod's battery. To accommodate, they adjusted by having one student operate the livestream, another on stand-by with a fully charged replacement smartphone or iPod, and another charging the dead or dying devices. In another example, when they had difficulty posting video files to WordPress, they uploaded them to YouTube instead, and embedded the link. Problem solved.

Pedagogical considerations

Artificiality of "breaking news." The biggest problem, and one I don't feel I ever completely overcame, is the inability to truly simulate a breaking-news environment. Yes, my students covered "live" news, but it wasn't really breaking news. It was human interest news. Clearly, smartphones are best-suited for a breaking-news environment, when reporters want to deliver important, perhaps even life-saving, information that a large number of people want or need to know. Although I haven't resolved that artificiality, students did respond to the live coverage with urgency and adrenaline, as though it were breaking news.

Lack of audience. Although the class posts its work all semester to a magazine-style blog, the site doesn't have a big audience. It's meant to be more of a playground and a place for students to store portfolio work. Generating an audience for our coverage proved difficult. We tried to solve that by collaborating with our campus newspaper, which embedded our Tumblr feed on a "Live Relays Coverage" tab, and by promoting our live coverage via social media. But the existence of an already-engaged audience would allow us to better test mobile interaction with readers and viewers.

Adequate training and preparation. Although college students of 18 to 22 years old are so-called "digital natives," they need adequate training, preparation and practice with the devices and the apps to be able to produce good content and to go out into the field with confidence. Give them ample time to fumble around and make mistakes in the classroom so that they are confident and capable when it counts. In class, I often jokingly issued a blanket "formal pardon," dispensation for any embarrassing mistakes. Although intended as a joke, it did seem to help create a classroom atmosphere where risk is acceptable and failure is instructive.

Modeling risk and failure. I tried to model my own risks and failures and to share them with students. It created a sense of collegiality and collaboration that I strive for. For example, I didn't know Tumblr had a daily limit of 75 photos. I found out when students embarked on their photo scavenger hunt and, after posting several dozen photos, couldn't post any more. After we enjoyed a laugh that we had "broken Tumblr," it turned into a "teachable moment," in which I had them research Tumblr's posting limits as well as those of Flickr, Facebook, TwitPic, YouTube, Instagram and others. If we hadn't "broken Tumblr," we may not have discovered these varying limits and discovered a better option for extensive photo posting.

What's Next?

With mobile technology and the journalism industry changing as rapidly as they are, continuing research and experimentation with mobile news-gathering are warranted. In particular, three areas seem ripe for further research and experimentation.

Experimentation with the iPad as a news-gathering device. A larger device offers some advantages over a smartphone (a larger touchscreen keyboard, a larger screen for audio, photo and video editing) but also disadvantages (an inferior camera, less portability). Also, newer versions of the iPhone and other smart-

phones will provide more opportunities for worthwhile experimentation.

Use of GPS for location-aware reporting and news-gathering. Location-aware apps are the future (Deibert, June 14, 2012). Reporting that adds location information to mobile content can enhance aggregation, enable mapping, support sharing via social media, and target a specific geographic audience.

Authentic audience interaction during a live story. In our experiments, the audience for our class's website was quite small. Although we generated some interest during events, particularly via Twitter during the bulldog contest and the pole vault, we didn't achieve true audience interaction. I'd like to find a way to give students a more realistic sense of give-and-take interaction with users during a breaking-news story.

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Recommended Reading

Mobile Media Toolkit

19 Resources to Improve Your Photo and Video Skills

Apps for the Mobile Journalist

5 Road-Tested iPhone Apps for Journalists

Mobile Reporting Field Guide