

# Podcast Lectures as a Primary Teaching Technology: Results of a One-Year Trial

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*How useful are podcasts in the political science classroom? Some educators argue that podcasts will revolutionize education; others are less convinced. However, to date, the evidence on podcasts has been slim. This article reports the results of a year-long trial using podcasts to aid in teaching political science to undergraduates at a research university. This trial does not test hypotheses but constitutes an exploratory probe that tells us more about how students and educators use, and react to, podcast lectures. The results suggest that podcasts are not likely a revolutionary teaching technology but can nonetheless have useful roles in the college classroom. Students liked the control, but few took advantage of the podcasts' portability, and most preferred to listen to them while reading lecture notes. No evidence was found for a relationship between student performance and their opinion of, or technique for using, the podcasts. For the professor, podcast lectures appeared to create time both in and out of class for more productive pursuits. Other findings, based on quantitative and qualitative survey data, generate some initial correlations and highlight anomalies for future pedagogy research.*

**Keywords** learning styles, MP3, pedagogy

## Introduction

This article reports the results of a year-long trial using podcast lectures as an aid in teaching political science to undergraduates at a research university. Previous research has reported on the use of podcasts as a teaching supplement (i.e., to provide optional material, previews of upcoming content, recordings of live in-class lectures, etc.). But in this trial, podcasts were used as a primary method of instruction. Students were directed to listen to podcast lectures outside of class, while class time was spent on more interactive teaching techniques (discussion, Q&A, and “active learning” exercises).

The trial results were mixed. Surveys showed that the students in the trial generally liked the podcast lectures insofar as they provided convenience, provided self-paced learning and made them feel more engaged with the written material. But the degree of overall acceptance was inverse U-shaped, with as many detractors as

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enthusiasts. One surprise finding was that many students independently reported a significant benefit from listening to the podcasts while simultaneously reading the lecture notes. Such a mixed-media approach may have implications for both practical podcast usage and future “learning styles” research.

From the instructor’s standpoint, the benefits of the podcasts seemed to be indirect. Podcast lectures freed class time for arguably more productive teaching techniques. Confirming the hypothesis of Roberts (2008), the in-class activities that the podcasts allowed were rated highly by students in helping them learn course concepts and analytical tools.

Also, I hypothesize that, since the course material was being taught more effectively during class, there was more time available for other faculty pursuits outside of class: student advising, curriculum design, research, and grant-writing, rather than lengthy office hours, after-class impromptu clarifications, or answering student e-mails. Thus, substitution of at least some in-class lectures with prerecorded podcast lectures may offer a rare “win-win” approach to improving the classroom experience while simultaneously increasing faculty productivity.

But we must be careful not to overstate the findings reported here. The trials and analysis described below do not report on a controlled experiment or quasi-experiment. Rather they constitute an exploratory probe. They tell us about how students and a teacher use, and react to, podcast lectures. These trials can therefore provide guidance to political science instructors considering different applications of podcasts in the college classroom. The trials also generate some initial correlations and highlight anomalies for pedagogy scholars attempting to better hypothesize and design research in education. Thus this article is not intended as hypothesis-testing research; instead it is meant to generate some initial hypotheses regarding a new technology with little research yet done on it.

This article adds value in several respects. First, it is the first report of a trial in which podcasts were used as a primary teaching technique in the social sciences, rather than as a supplemental technology. Second, most existing research on educational podcasting merely reports an instructor’s anecdotal and qualitative experiences. The research reported here gathers and analyzes quantitative data as well. While still anecdotal in some respects, the quantitative data allow for somewhat more precise and objective analysis. Certainly statistical analysis suffers its own problems, but it complements the mainly anecdotal qualitative data thus far reported. Third, rather than anonymous, voluntary, online surveys, this study reports on data taken from regular, periodic surveys of the full class, in which student academic backgrounds are identified and performance is tracked.

## **Background**

Podcasts begin as computer audio files, such as MP3s. An “MP3” is perhaps best analogized as the modern version of a tape recording. Instead of storing audio on a cassette tape, audio can now be recorded or copied directly into a computer file (an MP3), which is then played on an MP3 player.<sup>1</sup> Developed during the mid-1990s, MP3s received only mild consumer interest at first. Their usage then skyrocketed in October 2001 with the release of Apple’s iPod, which has since come to dominate the market for MP3 players.<sup>2</sup> These devices are now ubiquitous amongst college students. Initially, MP3s were most often used for storing and distributing music. But given their low cost and technical simplicity, individuals began

to produce MP3 recordings (of themselves, interviews, discussions, etc.) and post them for download on their Web sites and Weblogs. These “podcasts” rapidly gained in popularity and achieved widespread usage in 2004–2005 (Balas 2005). Thus, a podcast is simply an MP3 file that can be downloaded from a Web site and then played on a computer or MP3 player.

University faculty began to experiment with podcasts in the college classroom soon after their popularization, with some scholars hailing them a “revolutionary” new teaching technology (Jham et al. 2008; Rainsbury and McDonnell 2006). Entrepreneurial instructors have generally led the way here, while concerted effort by departments or universities remain rare, but increasing.<sup>3</sup> Also, different academic fields have proceeded with the technology at different speeds. Given the importance of the spoken word to foreign language education, this was one of the first areas of trial (Godwin-Jones 2005). Since then, the medical fields appear to have taken the lead in both use of, and research on, podcasts in education. Indeed at some hospitals, podcasts are now used as a training aid for surgeons (Whitehead, Bray, and Harrits 2007). However, in all fields of education, diffusion of this new teaching technology is still in its early stages; hence the key questions remain: how should podcasts best be used by instructors and students? And just how useful are they?

The few attempts at answering these questions have mostly taken the form of anecdotes. Faculty have reported their personal experience using podcasts in a variety of different classroom applications. Podcasts have been used to provide students with previews of upcoming material (Campell 2005), assessment tools (Lee 2006), test preparation (Copley 2007), optional extra material (Miller 2006), and even folksy “fireside chats” (Carmichael 2005). Though the focus of these reports has been on applications rather than technical features, this type of user-driven experimentation represents the search for a dominant design that many new technologies undergo in their early stages (Utterback 1994). The trials reported in this article should be seen as part of that process.

As instructors, we political scientists have been limited and uneven in our discovery of podcast technology. One of the first attempts both to move beyond anecdotes as well as to study podcast applications to political science education is Roberts (2008). Roberts experimented with podcast lectures in seven sections of two undergraduate courses (Introductory American Politics, Methods in Political Analysis) between 2006–2007. In these classes, he used podcasts as supplements: he recorded his in-class lectures live and then posted them online later that day (a.k.a. “coursecasts”). His primary objectives for the podcasts were to aid absent students, poor notetakers, students struggling to keep up with new material, and students reviewing for exams.

Roberts’ results were mixed. Disappointingly, he found that most students reported using the podcasts “none” or “not much,” and that their primary usage was in reviewing for exams. Also, corroborating prior research, he found that the lion’s share of his students did not use MP3 players (despite owning one) to listen to the podcasts but preferred instead to use their computers. This, as Roberts puts it, “. . . serves as something of an antidote to the podcasting literature’s dreams of students loading up their iPods with class lectures before they head to the gym for a workout” (588). Nor did his students appear to favor podcasts of complete lectures but instead recommended shorter podcasts of 5–15 minutes.

On the positive side, Roberts noticed no decrease in attendance: students did not ditch class and listen to the podcasts instead. Also, his students expressed great

enthusiasm for video podcasts and/or slides; however, Roberts suspects that this reflects a desire for hard-copies of notes and “important points” rather than a genuine enthusiasm for online video education. Roberts also found that podcasts were more successful in his upper-level course. Finally, he hypothesizes that “. . . strategic use of podcasting, though, could have the potential to reduce the amount of time spent in the classroom lecturing so that more time is available for true active learning opportunities” (591). The remainder of this article probes this last hypothesis.

This article also seeks to improve on prior research. Roberts (2008) provides excellent *prima facie* data and generates some initial observations for future hypothesizing and testing. However, his student responses were based on anonymous, voluntary Web surveys. Hence, as with all voluntary surveys, issues of sample bias arise. Also, since his surveys were anonymous, there was no way for Roberts to correlate student performance (either pre- or post-) and with podcast usage or opinions. Roberts’ sample size of respondents also appears to be quite small in these surveys ( $N=14-30$ ). Most importantly, since research is at the early stage where many hypotheses have yet to be formulated, more open-ended questions about usage and applications need to be administered.

### **How the Podcast Trials were Conducted**

I conducted trials of podcast lectures in 2007–2008, while teaching two consecutive semesters of an introductory course in international political economy (IPE). The course is required for all of my university’s majors in international affairs, as well as some majors in the economics, modern languages, and business departments (i.e., those with an international focus). The class is made up entirely of undergraduates who are generally advised to take the course during their third or fourth year.<sup>4</sup> Almost all students enter the course with at least some background in relevant subjects. For example, the students had each previously taken an average of eight international affairs courses, two economics courses, and two mathematics courses.

The course is an introductory survey course. It met for three hours of lecture per week for 16 weeks. No separate discussion or recitation section was held nor was a teaching assistant used other than for grading quizzes and some papers. The course covers basic IPE history, international trade, international finance, globalization, socialism, market failures, and socioeconomic networks. The primary textbooks used are Balaam and Veseth (2005) and Mankiw (2007), with additional readings drawn from Oatley (2006), Granovetter (1995), *The Economist* magazine, and other academic and news sources as appropriate. Other course materials included brief daily Weblog posts about current international economic news.

The students were evaluated using biweekly quizzes (short answer), in-class discussion and Q&A, in-class group presentations, short essays (blog postings), and papers. Where group work was conducted, the students were assigned to three- to five-person teams, with each team representing a country (fixed for the semester) of their choice. The students were not tested on the podcast lectures separately; rather they were given quizzes and assignments that tested their grasp of the course materials as a whole.

During each 16-week semester, 11 podcast lectures were assigned during the first third of the course: historical IPE, international trade, and the introductory week of international finance. It is important to emphasize that the podcasts were *not* recordings of the lectures given in class and meant for review later. Rather, the podcasts

I experimented with were recorded previously in my office, with no audience, and then assigned to students just like readings or homework. They were then posted for download both on my personal course Web site and on the university's official course management Web site (a customized version of Sakai). In class, these lectures were replaced by more interactive teaching approaches: discussion, Q&A, scenarios, exercises, etc.

Few technical problems were reported with the podcasts, and the students described high ease of use. Most students reported owning an MP3 player; those who did not were able to use existing software on their personal computers to listen to the podcasts. Each podcast lecture lasted approximately 30 minutes and was accompanied by a transcript or lecture notes. Three surveys were given to the students to evaluate attitudes, use, and effectiveness: one during the first day of class to establish backgrounds and baselines, one during week 5 (towards the end of the podcast section of the course) specifically assessing the podcast lectures, and a third survey was administered during the final week of the semester covering a variety of course elements (including the podcasts). Unstructured follow-up interviews were conducted at random throughout and after the course.

Finally, a comment on delivery style. Certainly on paper, the idea of listening to a podcast lecture must sound exceedingly dull. Surely, any lecturer must be better live than prerecorded. But far from being a wooden, boring media, students report that podcasts can make a large, anonymous class feel smaller and even more intimate (Carmichael 2005; Miller 2006). I personally made great effort to *perform* my podcast lectures, rather than merely recite them. And while prerecorded podcasts lack the "give and take" of the classroom,<sup>5</sup> I found that I was able to inject into them a degree of emotion and excitement that might sometimes be lacking in an early morning or late afternoon lecture; more on this below.

## **Trial Results**

Overall, the trials were mixed and revealed some surprises. Students in the trial were only somewhat favorable towards the podcast lectures, but very highly supportive of the in-class interactive activities that replaced the lectures. They appreciated the clarity, convenience, control over, and portability of the podcasts. But enthusiasm for the podcasts was inverse U-shaped; most students did not "voraciously" consume the podcasts (corroborates Roberts 2008); though a few did. Interestingly, no single attribute of the podcasts was agreed upon by a large majority of the students as being positive (or negative); different constituencies of students liked (and disliked) distinctly different aspects of the technology. Finally, the trials have led me to hypothesize that educators can combine podcast lectures with more efficient use of in-class time to create a more productive teaching semester. It bears repeating that the observations reported below are probatory. They are the products of survey data on a small sample; hence they constitute hypotheses to be tested in future research, as well as information to be considered by teaching faculty interested in using podcasts.

### ***Student Usage and Reactions***

One aspect of podcasts that appears to aid some students is that, unlike in-class lectures, they allow students to cover the material at their own pace. Students can stop

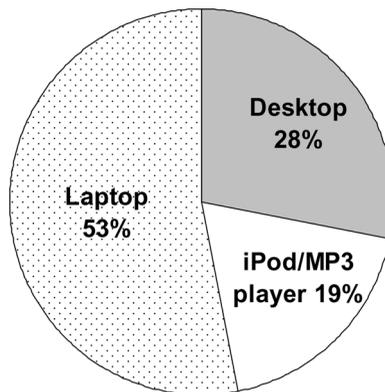
**Table 1.** What do you find most useful/helpful about the podcast lectures?\*

Transcripts	24%
Style/performance of lectures	16%
Allows me to rewind & repeat	16%
Better focus than reading alone	16%
Better info for understanding class concepts	16%
Multitasking	11%

\*Open-ended question; answers subsequently grouped in categories defined by author.

and rewind to review difficult concepts. They can pause the lecture to take notes or to consult supporting materials. All of these advantages were reported in answers to open-ended questions on the student surveys (Table 1). And then of course, there were the “multitaskers”: 11% of the students reported that they sometimes listened to the podcasts while doing activities unrelated to studying (e.g., exercise, errands, commuting, etc). These students commented that the podcasts allowed them to make better use of their time; though several also admitted that multitasking could cause them to miss important material on the podcast lectures.

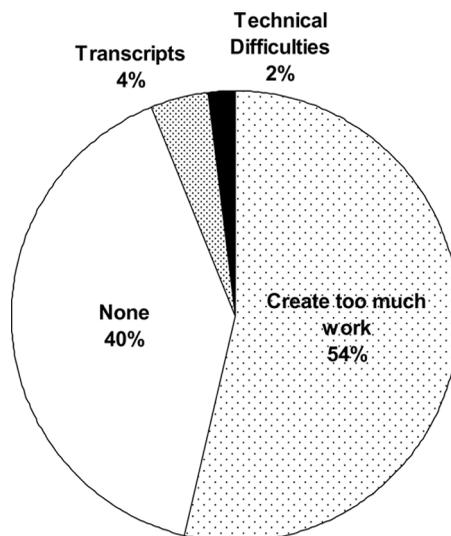
However, surprisingly, my students’ choice of MP3 listening device corroborated prior research (Figure 1). Just as Roberts (2008) and Read (2007) found in their studies, amongst my students only 19% “usually” listened to the lectures on their iPods/MP3 players, while 28% used their desktop computers, and 53% used their laptop computers. Roberts (2008) interpreted this limited use of iPods as an obstacle, at least given some proponents’ expectations of portable lectures revolutionizing education (Jham et al. 2008; Rainsbury and McDonnell 2006). But there are other possible explanations in my trials: students’ usage of computers as a preferred listening device may simply reflect their preference for simultaneously viewing the lecture notes while listening. Alternately, computer usage might also indicate that students are accessing supplementary materials online (readings, relevant Web sites, course management systems, encyclopedia, etc.) useful for understanding the podcasts.<sup>6</sup>

**Figure 1.** “What did you usually listen to the podcasts on?”

Educators and pedagogy scholars experimenting with podcasts should further investigate whether such a combined learning approach is preferred and effective.

Despite the findings shown in Figure 1, for the fraction of students that do go fully portable, my surveys suggest that podcast lectures may indeed be a significant technological improvement. Some students reported liking the mobility and accessibility of the podcasts. Students with absences due to illness, varsity sports, or other extracurricular commitments greatly appreciated the ability to take class lectures “on the road.” This is especially important at my university where passing grade requirements are stringently enforced by our highly popular athletic and extramural programs. Similarly, students with long commutes commented that they could “get work done” while traveling to and from campus; though others felt that this aspect was curtailed by their desire to simultaneously read the lecture transcripts or to take notes. Clearly more work needs to be done here, but my trials suggest that the usefulness and applicability of podcasts will likely depend on the individual student, and that their benefits will ultimately lie somewhere between those claimed by proponents and dismissed by critics.

When asked about problems with the podcasts, half of the students complained that their addition to the syllabus created too much work (Figure 2). As I discuss below, this is probably a result of misjudging the additional workload that podcasts create for students. But a small subset of these complaints did express difficulty in absorbing material in podcast format. They found the podcasts hard to listen to, to focus on, or to get information from. Future research might test whether these types of students are more visual or kinesthetic learners than auditory; more on this below. A few students said that fitting the podcast assignments into their schedules was awkward. A minority mentioned problems with my transcripts (which were sometimes just notes) or technical difficulties. But a full 40% of the students indicated that they could identify no significant problems with the podcasts. Admittedly, this response could be a product of politeness or fear of retribution. But this fear did



**Figure 2.** What problems/complaints do you have about the podcast lectures (open-ended question; answers subsequently grouped in categories defined by author)?

not manifest itself in answers to other open-ended questions where these same students comfortably criticized various aspects of the class, myself, and even my poorly fitted business shirts (sigh). Also official university surveys of the students gave me a 4.5 (out of 5) on “the instructor was an effective teacher” (my university’s mean is 4.17 for classes of my size). Thus there is good reason to suppose that many of these students honestly felt the podcasts were helpful; but instructors should also be cognizant that a significant minority of students will likely find them burdensome, as with any teaching technique.

### *Student Performance*

The quantitative data allowed me to probe for relationships between student performance and their opinion of, or technique for using, the podcasts (Tables 2–4). Interestingly, I could find no support for these relationships. Students at all different performance levels liked (or disliked) the MP3s. In fact, the best predictor of performance in the course was the students’ grades in their freshman introductory course on international relations (not taught by myself). Regressions revealed this finding to be robust to inclusion of year in school, number of economics courses taken, and even SAT scores. I interpret this as additional evidence that podcasts are not likely a revolutionary improvement in education; though they will be useful for some students.

Also, I could find no consistent predictor of which students liked (or disliked) the podcasts. Neither regressions nor correlations revealed any relationship between student opinions of the podcasts and any other variables including course grade, SAT scores, freshman intro course score, or prior podcast usage. This corroborates Roberts (2008), who found little difference in podcast usage between his upper- and lower-level courses. Again, my data were are limited, hence I do not offer these regressions as definitive hypothesis tests; there are merely initial investigations. They are useful to researchers in that, if a relationship does exist, the regressions show that it is either too small to show up in my small trial or depends upon an omitted control variable.

**Table 2.** Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Year	80	3.68	0.92	1	7
Course grade	84	0.62	0.12	0.16	0.81
Difficulty	81	4.27	0.59	2.5	5
Workload	81	4.10	0.65	2	5
MP3 opinion	79	4.49	2.41	1	8
Econ major	83	0.18	0.39	0	1
SAT	77	1330	97.5	1020	1510
IR intro grade	78	3.40	0.63	1	4
# Econ courses	82	1.83	1.69	0	7
# IR courses	83	7.89	3.24	0	15
# Math courses	83	2.24	1.03	0	6
Prior Mp3 usage	76	0.45	0.5	0	1
Transcript usage	77	2.67	1.16	0	4

**Table 3.** Correlation coefficients

	Course grade	MP3 opinion	IR intro grade	Year	Difficulty	Workload	Econ major	Econ SAT	# Econ courses	# IR courses	# Math courses	Prior MP3 use	Transcript usage
Course grade	1												
MP3 opinion	0.07	1											
IR intro grade	0.38	-0.03	1										
Year	0.03	0.07	-0.10	1									
Difficulty	-0.15	-0.08	-0.07	-0.13	1								
Workload	0.19	-0.01	-0.08	0.05	0.38	1							
Econ major	0.32	0.15	0.19	0.07	-0.46	-0.08	1						
SAT	-0.07	-0.22	-0.06	-0.10	-0.18	-0.29	-0.05	1					
# Econ courses	0.19	0.14	0.07	0.11	-0.39	-0.08	0.83	-0.23	1				
# IR courses	-0.35	-0.08	-0.11	0.17	0.17	0.12	-0.52	-0.05	-0.40	1			
# Math courses	0.05	-0.10	-0.02	0.33	-0.05	0.00	0.14	0.19	0.09	-0.12	1		
Prior MP3 use	-0.23	0.08	-0.08	-0.04	0.04	-0.17	0.02	-0.12	0.02	0.08	0.12	1	
Transcript usage	0.09	0.42	-0.24	0.00	-0.11	0.00	0.00	-0.11	0.04	0.02	-0.16	0.02	1

$N=61$ .

**Table 4.** Basic regressions<sup>†</sup>

DV = Grade (points earned as % of total possible)					DV = opinion of MP3 lectures	
MP3 opinion	0.0003 (0.005)	0.003 (0.005)		0.002 (0.006)	Grade	2.06 (3.57)
# Econ courses		0.01 (0.007)	0.01 (0.008)*	0.009 (0.007)	# Econ courses	0.12 (0.19)
SAT		0.00006 (0.0001)	0.0001 (0.0001)	0.00003 (0.0001)	SAT	-0.005 (0.003)
Year		0.009 (0.01)	0.01 (0.02)	0.01 (0.02)	Year	0.12 (0.42)
Intro IR grade		0.06 (0.02)**	0.07 (0.02)**	0.07 (0.02)**	Intro IR grade	-0.31 (0.62)
Transcript usage				0.01 (0.01)	Prior MP3 use	0.37 (0.66)
_cons	0.63 (0.02)**	0.28 (0.21)	0.17 (0.22)	0.29 (0.24)	_cons	9.79 (5.88)
Obs	79	68	70	62	Obs	61
R2	0.004	0.16	0.17	0.07	R2	0.07

\*  $p < .10$ ; \*\*  $p < .05$ . Ordinary least squares, standard errors in parentheses.

<sup>†</sup>These results represent a subset of the regression models run. In no case was a statistically significant relationship found between student performance and podcast opinion or between podcast opinion and any other variable.

In theory, podcasts should allow teachers to target auditory learners in a manner that readings alone do not. Research has shown that students differ in their styles of learning (Cassidy 2004). Such a view calls for the use of different teaching methods that take into account these individual differences (Fox and Ronkowski 1997). According to one widely used classification system, students differ in the degree to which they learn via auditory, visual, or kinesthetic (physical) involvement with the material (Cassidy and Eachus 2000). Therefore, students who learn better via listening should benefit from the addition of podcasts, as opposed to replacing in-class lectures with more out-of-class readings.

While not a controlled experiment, the trials did allow me to probe this area for possibilities for future research. The surveys suggested mixed results in regards to learning styles (Table 5). Just under two-thirds of the students used some combination of the podcasts and the accompanying transcripts. Interestingly, one-third of the students mostly, or only, read the accompanying lecture transcripts and used the podcasts little or not at all. Many of these students reported that the podcast lectures were too long, and that reading the transcripts was faster; however, other students reported the exact opposite experience. Interestingly, even many of the students who preferred the lecture notes reported that they *also* wanted to listen to the podcasts. They commented that this allowed them to focus better than using either media alone. Several specifically noted that the podcasts made them feel more “engaged” with the material than reading alone, reporting also that the experience

**Table 5.** “Between the podcasts and the accompanying lecture notes, which do you find yourself using?”

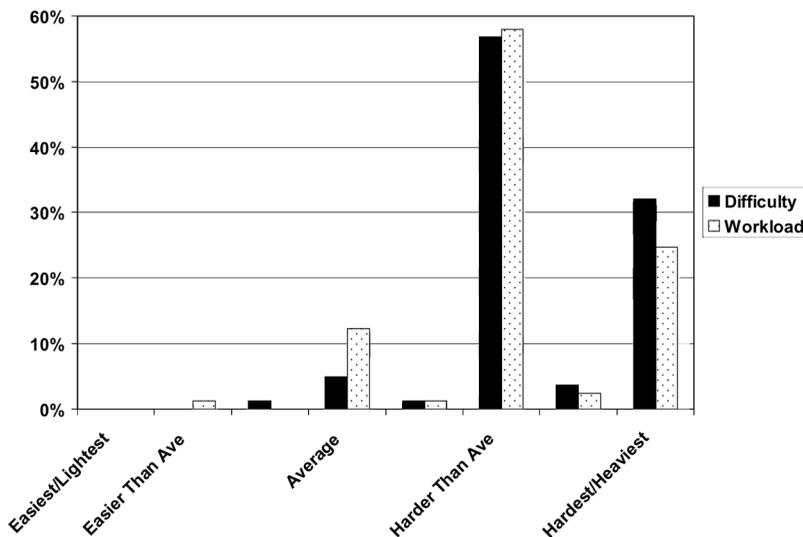
Just the lecture notes, little or no podcasts	30%
More the lecture notes than the podcasts	29%
Both about equally	26%
More the podcasts than the lecture notes	10%
Just the podcasts, little or no lecture notes	5%

made them more aware of how they learn (see also Table 1). Thus for a significant subset of students in the trial, the combination of auditory and visual material seemed to improve self-reported learning. Therefore instructors considering podcasts may want to post their lecture scripts for download as well; while pedagogy scholars should consider testing this hypothesis more rigorously, since it could represent one of the more effective applications of podcasts.

### *Educator Usage and Reactions*

The trials were not designed to study my usage of, or reactions to, podcast lectures as a teacher. However, I came away from the trials with four hypotheses about how MP3s might aid educators. First, assigning the podcasts outside class created additional in-class time available for more productive faculty-student interactions. Decades of research have shown that students learn better from, and prefer, “active-learning” approaches (Smith et al. 2005). These approaches include debate, discussion, scenario-based exercises, working through problems in class, etc. But scheduling time for active learning is problematic when much of class is taken up by delivering the basic course material via lectures. Indeed, it can be difficult to conduct active-learning exercises when students do not yet know the basic definitions, concepts, or historical issues they are supposed to work with. In recognition of this, even active-learning proponents see a major role for traditional lectures in college education (Bain 2004; Bligh 2000). Therefore, the best use of podcasts may not be recordings of live in-class lectures meant for review later. Instead podcasts might be more useful when used to replace some of the in-class lectures and thereby provide a complement to, or foundation for, in-class activities.

Second, the podcasts allowed me to either cover more course material than otherwise possible, or the same material more thoroughly than otherwise possible. This can be an important option given the pressure on faculty to include more and more topics within fixed course curricula. However, this benefit was not always appreciated by the students in the trial (Figure 3). For example, in the fall semester, 60% of the students described the workload as being “heavier than average,” while 20% felt that it was “the heaviest” of any class they had taken. The students produced very similar responses when asked about the course’s level of difficulty. Yet, surprisingly only 16% of the class described the pace of the course as “too fast,” with the remaining 84% describing it as “about right.” Thus the students appeared not to mind the enhanced scope of the class but resisted the depth into which we delved on some topics and the additional work required to do so. Nonetheless, instructors considering using podcasts in this way should first consider their impact on overall course workload.



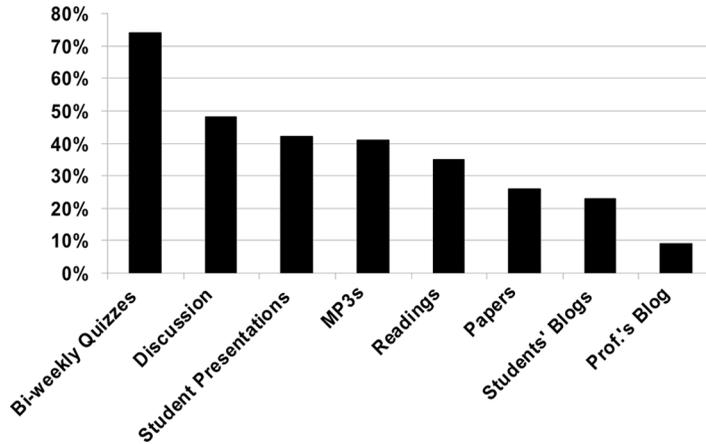
**Figure 3.** “Compared to your other classes, how would you rank this class in...” Some respondents wrote in a score between two given categories; others circled two responses. In either case the mean was entered.

Third, during the trials I found that the podcasts allowed me to capture and preserve a high-quality lecture. Research has shown that even well-practiced lectures by experts regularly contain errors, either factual or oratory (Lehrer 1994; Tomaska 2000). These errors can translate into confusion or distraction for students, who often then compound the problem by missing subsequent lecture points as they attempt to understand the initial mistake. Alternatively, the podcast format allows the lecturer to read from a well-researched and prepared script or notes without distractions or stage pressure. Using this approach, I found that I could not only deliver a more accurate lecture but also perform it with the energy and emotion necessary to make the material more compelling. As an aside, faculty who occasionally suffer from stage fright might therefore find podcasts particularly appealing.

This combination of more accurate, better performed lectures and more in-class active learning appeared to have been well received by the students. For example, when asked to rank the eight different assignments that “most helped me to learn the material,” 41% of students rated the podcasts in their top three (Figure 4). But more importantly, 48% of the students listed “Discussion-Q&A” amongst their top three, and 74% listed the biweekly quizzes; both of which were made more possible with the class time provided by the podcasts lectures.

Similarly, when asked the open-ended question “what three things should the professor do to improve this course,” a few students suggested adding more podcasts, no one suggested decreasing or eliminating them, and 34% of the suggested improvements implicitly called for a greater role for the podcasts: more “active-learning” activities in class, more high-quality lectures, fewer readings (Table 6).

As an aside to instructors, an open-ended question about recommended podcast length brought back responses in the range of 10–45 minutes, with a mean and mode of approximately 20 minutes (standard deviation of 11.4; Figure 5). This mean is comparable to the 5–15 minutes suggested by Roberts’ students.<sup>7</sup> But this does



**Figure 4.** “Rank the assignments that most helped you to learn the material.” \*Percentage of students including assignment “X” in their top three choices.

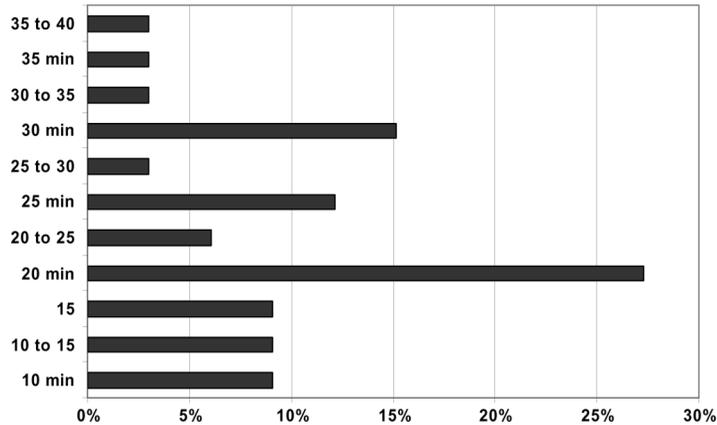
not imply that instructors must shorten their lectures in order to podcast them. Instead, according to subsequent interviews, students seem to prefer that long lectures be divided up into more digestible and separate podcast “chapters.” Professional audio lecture firms follow a similar practice. Apparently, most listeners prefer to complete a podcast rather than to pause midway through when they need a break. I leave this phenomenon to educational psychologists to explain.

Fourth, the combination of better lectures and additional in-class active learning seemed to provide me with more time to focus on student advising, course design, research, and grant writing. Again, fewer errors and less confusion in the lectures translated into less time spent on clarification afterwards. Also, the active-learning exercises may have *taught* the students better than a lecture or reading assignment merely *delivering* the material. Immediately into the trials, I found that fewer students came by my office hours, lingered after class for clarification or e-mailed for

**Table 6.** What should the professor do to improve this class?\*

Complaint about assignment “X”	23%
<b>More discussion</b>	<b>13%</b>
<b>Fewer readings</b>	<b>11%</b>
Syllabus change	11%
More/better online material	9%
Improve study guides	7%
<b>More high-quality lectures</b>	<b>7%</b>
TA complaint	6%
Nothing	6%
More MP3s	3%
<b>More active learning exercises</b>	<b>3%</b>
Less discussion	1%

\*Open-ended question; answers subsequently grouped in categories defined by author. Shaded entries implicitly call for a greater role for podcast lectures.



**Figure 5.** “What do you recommend as the best length (in minutes) for an individual MP3 lecture?” Open-ended question; answers subsequently grouped in categories defined by author. Mean equal 21.8 minutes, standard deviation of 11.4.

help, and those that did contacted me for advising issues rather than teaching issues (no data was gathered on time spent on office hours and student e-mails, hence this observation is purely anecdotal). Nor did this appear to be a result of me scaring the students away: official university surveys of the students accorded me a 4.5 (out of 5) on “approachable and willing to assist.”

Moreover, these time savings have since grown because I can reassign my podcast lectures over subsequent semesters. This eliminates hours of prep time and helps insure against a natural decrease in speaker enthusiasm for perennial material. I can also freshen my lectures every semester since podcast recordings can be edited like any other computer file: new sections can be added or existing material can be deleted or cut and pasted within the lecture. Admittedly, editing a podcast is more time consuming than editing a text file, which points to a potential weakness in the podcasts. That is, they work well for my introductory survey course in which I repeat certain basic concepts from year to year with minor changes, but podcasts are not necessarily a good replacement for all lecture material. Certain perennial topics (i.e., comparative advantage, historical mercantilism, Bretton Woods, etc.) need not be repackaged every semester, which makes them well fitted for the podcasts. But more dynamic topics that require constant updating (e.g., globalization, the WTO, exchange rate issues) stay a part of my “live” in-class lecture inventory. Thus courses heavy with constantly changing material might be a poor venue for podcasts. Likewise faculty with frequently changing course loads may not find podcasts as efficient if they cannot be reassigned across different classes over time.

Nonetheless, the time-saving aspect of the podcasts may be particularly attractive for faculty at research universities like my own. Admittedly, this concern for research time may sound selfish or offensive to some teachers. But all types of higher learning institutions place multiple demands on faculty time. In my case, while both myself and my department care deeply about teaching and value it highly, my research is also important. Indeed, at most research universities, research performance is the deciding factor in promotion and tenure decisions. This tension tends to create an infamous trade-off between research and teaching quality at these

institutions. So the potential for podcasts to enhance teaching productivity may make it a positive sum technology for both students and faculty.

## **Conclusions**

Podcast lectures are not a “silver bullet,” but they may serve as a valuable part of a “silver buckshot” approach to teaching and learning. In several studies, including the one reported here, a significant minority of students report great enthusiasm for podcasts; but there are also many detractors. Hence instructors should be wary of revolutionary claims or predictions made by podcast proponents. But podcasts should not be dismissed either. Those students who are making good use of podcast lectures may be receiving real educational benefits, and these should not be lightly discounted without further research. As with any other teaching technique, instructors must be balanced in their approach to, and expectations of, podcasts.

In the present study, podcast lectures seemed to aid different students in different ways. They allowed students to cover the lecture material at their own pace and to use supplementary materials while listening. One of the most interesting hypotheses generated by these trials is that a combination of the podcast lectures and their transcripts may have been significantly more helpful to students than either study aid alone. On the purely anecdotal side, I would argue that the greatest benefits of podcast lectures were indirect. Certainly lectures allow faculty to customize course material to best fit their goals as teachers, as well as the needs of their students. Lectures also allow us to energize course material, to put it into proper context, and to highlight aspects that we feel are most important for student learning. However, lectures may not be the best use of the rare time we have with our students. These trials suggest that faculty might be able to employ simple, inexpensive podcast technology in order to improve lecture quality, clear up time in class for more effective student-professor interaction, cover more material than otherwise possible and perhaps better reach auditory learners and thereby increase teaching productivity. And increases in teaching productivity can translate into increases in overall productivity; an added bonus for faculty who face heavy research, community-service, advising, administrative, or other requirements for promotion and tenure. Thus, substitution of at least some in-class lectures with prerecorded podcast lectures appears to offer a rare means by which to improve the classroom experience while simultaneously increasing time for other faculty pursuits. Podcasts are not likely a revolutionary teaching technology, but they can have useful roles in the college classroom and should not be dismissed as mere gimmicks or curiosities.

It is equally important to be upfront about what these trials did not accomplish. Note that while these trials produced data on student preferences and practices, they did not evaluate the impact of podcasts on student learning. Nor did the trials test the effectiveness of the active-learning approaches for which the podcasts made time. Such tests require controlled experiments or quasi-experiments, which are the logical next step in research. Some may criticize testing usability before effectiveness as putting the research cart before the horse. But what good is an effective teaching technology if students are not willing to use it? Just such “supply-push” approaches towards education have failed before (Seidel 1969; Zorbaugh 1957). Hence usability trials, such as those reported here, to better understand how students use and interact with different podcast teaching techniques are an important step in improving political science education.

## Appendix 1

**Table 7.** List of podcast lectures & corresponding in-class activities for which they allow time

Podcast	Classroom activity
Ancient IPE I (Rise of Rome) Ancient IPE II (Rise of Rome)	Discussion, Q&A
Medieval IPE (Middle Ages) Medieval IPE (Birth of Nation-State)	Discussion, Q&A
Mercantilism I (Early & Classic) Mercantilism II (Neo & Structural)	Role-Play & Debate*: In What Ways is Your Team's Country Mercantilist? Who Wins/Loses From These Policies?
Physiocrats, Smith, Ricardo Rise & Fall of Free Trade in the United States and Europe	In-class Term Paper Workshop
Basic Gains & Losses From Trade	Role-Play & Debate*: If You Are Actor/Employee X, Should You Favor or Oppose Free Trade? What Form of Trade Protectionism Should You Prefer?
Strategic Trade	Role-Play & Debate*: Your Team's Country Wishes to Enter the Cell phone/Alt. Energy Industry, What Policies Should It Pursue?
Introduction to Finance: 3 Tricks	Samples of Historical Money passed around; Money's functions are discussed and debated

\*In Role-Play & Debate exercises, the members of each country team are given the team's analytical task. They consider it as individuals for 5 minutes, then in teams for 10 minutes. Class is then called to order. A team is chosen at random and questioned by the professor, who then draws in other individuals and teams to join in the debate. When one team's answer has an impact on another team's country (i.e., "we would put tariffs on imports of their cell phones to promote domestic production"), the second team is pressed for a response and brought into the debate. The professor moves from team to team until they are exhausted or the debates become redundant. A similar procedure is followed if the exercise focuses on solely on individual students.

## Appendix 2: How to Create MP3 Lectures

Faculty interested in creating their own MP3 lectures should be relieved to know that the process is inexpensive, technologically simple, and quick to learn. Podcast guides and tutorials can be found in bookstores, academic journals (e.g., Rowell et al. 2006) and online; only the basic requirements are listed here. Certainly, the adventurous can purchase podcast studio kits complete with special soundcards, microphones, and mixers; but none of this is necessary. Prospective lecturers can be up and running after spending as little as \$15 and two hours of learning and installation time.

Indeed, I had little background in computer configuration or electronics prior to my experimentation with MP3 technology.

### ***Hardware***

Most personal computers and laptops come already equipped with a basic sound-card for processing audio. The only extra purchase required is a basic microphone or, better yet, a headphone-microphone headset, which connects directly to the computer. These can be found at most retail electronics stores for \$15–\$30.

### ***Software***

Two pieces of software are also required. You will need software for audio recording and editing, which can be downloaded for free online ([audacity.sourceforge.net](http://audacity.sourceforge.net)). You will also require software that can convert your recording into an MP3 format, called an “MP3 encoder.” Again, this software can be downloaded for free online ([lame.sourceforge.net](http://lame.sourceforge.net)). Learning to install and use this software is trivial, and a variety of tutorials can be found online (e.g., [www.how-to-podcast-tutorial.com](http://www.how-to-podcast-tutorial.com)) or in bookstores.

### ***Support***

I had no, nor did I require any, university or departmental support or encouragement for this trial beyond course management software. My university and department generally permit faculty liberty to conduct classes as they see fit, therefore there were certainly no obstacles either. Rather, my initial impetus to experiment with MP3 lectures in the college classroom was generated by my previous experience as a consumer of them. As a graduate student, I greatly increased my productivity by purchasing professional MP3 recordings of university lecturers on statistics, history, and logic. It was therefore natural for me to experiment with them as faculty. However, many schools, including my own, do offer small grants or funding lines for new teaching technologies. Clearly, much depends on the individual and their environment. For example, some faculty within my university are beginning to experiment with various teaching technologies and now offer advice, workshops, and equipment loans to colleagues. Many schools also have a Center for Teaching and Learning that can offer expertise and advice. Alternately, professors in less entrepreneurial or resource-rich environments might consider attending the APSA annual Teaching and Learning Conference, which is generally an excellent place to find workshops, tutorials, exhibits, and fellow faculty members who are experimenting with these types of technologies.

### ***Legal***

To date, the legal aspects of university podcasting remain murky, though little prosecuted. Two primary concerns for university educators are copyrights (What non-original materials can teachers include in their podcasts? How can podcasts be distributed to students?) and ownership (Does the university or professor own the podcast?). Practically speaking, professors who produce their own podcasts have

operated on the basis of some simple *de facto* rules of thumb: (1) the less non-original material, the better (e.g., short clips or quotes are less onerous than whole recordings of non-original material); (2) the less widely distributed or easily accessed non-original material, the better (e.g., using password protected Web sites for downloads); (3) original lectures are generally considered the property of the teacher. However, these practices would not likely survive legal scrutiny in some cases and can depend greatly upon what kinds of materials are used to make the podcasts (e.g., copyrighted music or sound effects, live in-class lectures in which student voices are recorded, etc.). Given the complexity of these issues and my lack of legal expertise, I refer interested readers to Townsend-Gard and Voegelé (2006) as an introduction. Thereafter, the Center for Internet and Society at Stanford Law School (<http://cyberlaw.stanford.edu/>) and the online “Podcasting Legal Guide” ([http://wiki.creativecommons.org/Podcasting\\_Legal\\_Guide](http://wiki.creativecommons.org/Podcasting_Legal_Guide)) are both excellent resources.

## Notes

1. The term “MP3” specifically refers to a type of computer storage format. Other popular competing formats include Microsoft’s WAV and proprietary WMA formats, and the open-source OGG format. However, since it is the most widely used format, the term “MP3” will be used generically throughout this article to refer to any type of computer audio file.

2. In fact, the iPod is so popular, that the word “iPod” is slowly becoming a generic term and often refers to any portable listening device that plays audio computer files. Therefore the words “iPod,” “MP3 player,” and “portable audio device” are often used interchangeably in common usage.

3. Exceptions include Allegheny College, Drexel, Duke, Purdue, Stanford, and the University of Chicago, where university support has been relatively strong and widespread.

4. The fall 2007 course had 50 students (17 juniors, 33 seniors), the spring 2008 course had 36 students (1 freshman, 2 sophomores, 17 juniors, 16 seniors).

5. Recordings of in-class lectures also have problems. For example, Roberts (2008) reported that his live classroom discussions were captured poorly by his headset microphone.

6. Thanks to an anonymous reviewer for suggesting these alternate hypotheses.

7. Though Roberts appears to have asked his students about podcasts of “extra material”: “how long should they be so that you would listen to them?”

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