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**Article (Accepted version)  
(Refereed)**

**Original citation:**

Page, Edward C. (2015) Undergraduate research: an apprenticeship approach to teaching political science methods. [European Political Science](#), 14 . pp. 340-354. ISSN 1680-4333  
DOI: [10.1057/eps.2015.17](https://doi.org/10.1057/eps.2015.17)

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Available in LSE Research Online: March 2015

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## **Undergraduate research. An apprenticeship approach to teaching political science methods<sup>1</sup>.**

### *Abstract*

*Undergraduate research, the practice of teaching students by engaging them in a research project, has a long record of achievement. Research-based evaluations show it is likely to have a range of positive educational and career outcomes for students. Many examinations of these benefits apply to STEM subjects. This paper sets out one approach to undergraduate research in political science, based on an apprenticeship model. Using a small survey of all those who have followed the GV314 course at the London School of Economics since 2004 the paper finds evidence that the benefits of undergraduate research appear to be quite striking outside STEM subjects too.*

### **Introduction**

Undergraduate involvement in "real research" projects has been argued to be a "high impact" form of teaching – a method alleged to have learning outcomes far above those yielded by conventional ways of running courses (Kuh 2008; Brownell and Swaner 2010). Moreover it is hard to find any empirical evaluations of undergraduate research that conclude that its effects on educational outcomes are anything other than positive. These effects, as will be discussed below, include increasing overall academic performance, shaping career choices and enhancing minority education experiences.

In political science, the most common method of exposing undergraduates to real research has been to encourage and supervise students as they conduct research largely of their own design, for instance, an undergraduate dissertation or even a group project. Yet the bigger advantages of undergraduate research appear to come from an “apprenticeship” model, in which faculty and students work as partners in a research project. This model is more common in the STEM subjects (Science, Technology,

Engineering and Mathematics), where students can join a professor's research team. It is less common in political science.

This paper outlines one implementation of an apprentice model undergraduate research arrangement in political science at the London School of Economics (LSE), a course with the course code “GV314” and the title “Empirical Research in Government”, and explores the evidence to suggest that it has the kind of advantages associated with the model in the natural sciences.

In some ways there are some specific features of the UK system, and the LSE in particular, that might have some advantages for running a course along these lines. It is arguably easier to put on a course in research methods in UK universities which are generally more likely to run such courses for political science students than those in the US (Thies and Hogan 2005; Parker 2010, Ryan and Saunders 2014). In the US universities are less likely to include project or dissertation work as part of undergraduate assessment in political science (Thies and Hogan 2005). The tradition of year-long courses in UK universities is stronger than in the US and many European countries. Yet the specific circumstances in which it is taught does not mean that any assessment of this particular course is atypical and of no wider interest. Studies on undergraduate research include a range of very different courses, from summer schools to short components of laboratory classes, and the claimed benefits are supposed to result from any significant involvement of undergraduates in research rather than a specific design.

The paper begins with a brief overview of the range of advantages claimed for apprentice model undergraduate research as well as some of what the literature describes as its "risks". As will be clear in this overview, the literature itself has several meta-analyses and reviews and this paper will not try to summarise the range of studies and the methods on which they have been based. Rather, the purpose of discussing these studies is to outline what we might be looking for in evaluating the LSE course. It then goes on to describe GV314, how it has been run, and how the commonly identified risks have affected it. The paper goes on to look at the empirical evidence for believing that the oft-cited benefits of this form of teaching can be found in GV314 on the basis of a survey of all those who have been through it.

### **The impact of undergraduate research**

The idea of teaching university students by directly involving them in advanced project work is not new, and can be traced back at least to the sixteenth century (Knoll 1997). More specifically undergraduate research has been associated with Humboldtian principles of university education from the early nineteenth century, according to which teachers and students collaborate in the pursuit of scholarly inquiry (Elton 2008), and it has been pursued on a formal and informal basis for a very long time. Undergraduate participation played a great part in the chemistry research of Justus Liebig in Giessen in the early nineteenth century (Clark 1997), and Alvin Gouldner's (1954) sociological classic *Patterns of Industrial Bureaucracy* was the product of a research collaboration with undergraduates at the University of Buffalo, New York. More recently, the US Council on Undergraduate Research was set up in 1979 to promote it, its British

counterpart (British Council on Undergraduate Research) was founded in 2010, but there were earlier British institutions promoting undergraduate research nationally such as Warwick's Reinvention Centre (founded in 2005) now the Institute for Advanced Teaching and Learning with its own journal publishing undergraduate research, *Reinvention*.

Current interest in the whole issue of involving undergraduates in primary research activity is associated with the influence of the Boyer Commission (1998). Its report put "research based learning" as the first of its proposed radical changes in the way undergraduates should be taught in the US<sup>2</sup>. It involves offering students "the opportunity to work in primary materials, perhaps linked to their professors' research projects" and by the time they finish their studies "the able undergraduate should be ready for research of the same character and approximately the same complexity as the first-year graduate student". Moreover it can also mean that "field work and internships should be fostered to provide opportunities for original work" (Boyer 1998: 17).

There are a variety of ways of trying to provide undergraduate research opportunities -- through small individual projects, larger group projects, as essentially extramural activities, as linked to a larger research agenda, as summer school projects for example. The long-standing tradition of undergraduates doing a dissertation is also frequently classed as "undergraduate research". The research discussed below, and the LSE course I will discuss, is a particular form of undergraduate research: the "apprentice model" (Laursen et al. 2010, see also Feldman, Divoll and Rogan-Klyve 2013) which brings the

involvement of the undergraduate in a piece of research, often as part of a team, in which the undergraduate is supervised by an experienced researcher. Within this broad model there is still great variation in how it is set up and delivered, and some of this variation is, as will be discussed below, associated with the scale and type of benefits such initiatives are supposed to bring. Yet the broad idea of engaging undergraduates directly in apprentice-style research activity has attracted a significant empirical literature that has sought to assess whether the claimed impacts are supported by the evidence.

A complete list of the potential benefits of undergraduate research explored by scholars such as Laursen et al. (2010) Bauer and Bennett (2003) and Sadler *et al.* (2010), themselves based on reviews of other studies as well as their own original research would be long, detailed and contain alleged effects that differ only in intricate detail from each other. The kinds of benefits in these studies can be divided into different categories including benefits for

- a) *personal development* (including increased confidence; collegial relationships with peers and teachers; better ability to work independently; improved critical thinking; increased tolerance and perseverance);
- b) *the acquisition of transferable skills* (including presentation of research; problem-solving, writing);
- c) *career decisions* (clarifying career decisions; attracting students to careers in research; preparing those who go into science for a scientific career; showing students that "research is not for me")
- d) *career prospects* (helps get a job, strengthens the CV)

e) *social inclusion* (helps minority groups to develop an interest in a research career).

These critical accounts all note the ultimately unsatisfactory character of the evidence to support such alleged impacts of undergraduate research in the studies they review (discussed below), but they nevertheless view the evidence available as sufficient to endorse the view that undergraduate research does have significantly positive impacts. For example, Sadler et al. (2010: 53) conclude “The evidence reviewed in this report provides support for many positive outcomes associated with scientific research apprenticeships, but we believe the research base is far from complete”. Seymour et al. (2004: 530) do not support some of the claims made for undergraduate research (such as the impact on career choices) but nevertheless conclude there is “substantial support to the proposition that undergraduate research is an educational and personal-growth experience with many transferable benefits”.

There is a range of risks and downsides associated with apprentice model undergraduate research. It can be very labour intensive for faculty (Winn 2005). Depending on how teaching is organized, mentoring students on research can take longer in preparation and/or delivery than conventional lectures and classes. There are risks associated with the power of faculty over undergraduate students (see Lips 1999): using students as "unpaid" researcher assistants, and the associated temptation to rely on student research to maintain a publication record.

Gresty et al. (2013) suggest a further risk: that "teachers can lose control of the research

process by encouraging students to be partners in the activity". While recognizing, along with Sadler et al. (2010: 148) that seeing things go wrong in research can be positive, they nevertheless suggest that "students may struggle with the process, obtain little useful data and end up with a negative perception of research" (Gresty et al. 2013).

Other risks might be associated with the gender and ethnic equality aspirations of the undergraduate research. Kardash (2000) suggested that women were less likely to benefit from increases in understanding of scientific concepts through undergraduate research than men: men were more likely to claim an improvement in their "ability to form research hypotheses" than women (but Russell et al. 2005: 26). Moreover, Ishiyama and Breunig (2003) found that "collaborative research appears to have more of an effect on high ability students". Research has tended to find evidence of that undergraduate research helps achieve greater minority retention in education (although the findings here vary in defining the strength of this effect compare Lopatto 2007, Nagda et al. 1998 and Russell, Hancock and McCulloch 2007). If one considers that the faculty time taken with undergraduate research is generally greater than for other kinds of teaching and that some types of student might stand to benefit disproportionately from it, then undergraduate research could have some socially regressive impacts.

### **The LSE GV314 Course**

The GV314 course was not designed specifically to bring the short and long term impacts as set out in the empirical literature. However, the empirical social science literature does



associate a range of positive impacts with a course of this kind, so we can look to see what evidence there is to support these findings here. In order to do this, we need a brief description of the course and how it is put together.

GV314 is a final year undergraduate course taught in a small class with a maximum of 15 students at the London School of Economics. It lasts a full academic year, with 20 weeks teaching over two trimesters from October to March with examinations in June in the third trimester. The students it attracts are doing BSc honours degrees in Government, whether as a single major or joint with Economics, Philosophy or History. All students are in the final year of their three-year degree. Participation in the course is entirely optional and recruitment is first-come-first-served. In its early years (2004/5 and 2006/7) it ran with under 10 students and in the later years (2009/10, 2010/11, 2011/12 and 2012/13) with a dozen or over (the maximum was 14).

The course is built around a research project. I set out the broad thinking behind the project, largely through specifying the type of respondents we might target for our survey. Conducting a self-administered survey is a *sine qua non* for the project as it is written in the course specification. Once class starts we discuss what we want to find out from our respondents. Of course, the prior selection of respondents, for example academics who appear frequently on the media or interest group representatives who respond to government consultations, narrows the range of intellectual questions likely to be pursued in the project. The target respondents for the survey are selected bearing the following considerations in mind: relatively little should be known about them already

(as this means that we are more likely to be able to get something published); there is reason to believe a reasonable number of them might respond to a questionnaire; the research can be largely completed within five months (students start in September and have to have the data for March); and the questions that can be asked of them hold some promise of yielding interesting empirical material for supervisor and students alike.

The surveys we have completed cover (with a brief outline of the basic question in italics):

- lawyers who work in municipal government *why they work in the public sector for a fraction of the salary they can get in the private sector*
- local community groups *how they lobby municipal governments*
- people who respond to formal government consultations *how much influence they have on policy*
- special advisers to government ministers *who they are and how they influence policy*
- academics commissioned to write evaluation reports for government *whether government "leans" on them to produce acceptable results*
- academics who appear on the media *how academics get on radio and TV and what they talk about*

Thinking about the survey for September usually means sorting out a topic in the previous spring. I approach colleagues for views about the feasibility of the topic and how much interest there is likely to be in an article or research note based on a survey in this area. This is also when I start to arrange, as best one can, the necessary permissions

and establish as far as possible whether there is likely to be an acceptable response rate. Since 2009 interviews have become a normal part of the research and students have tended to do two interviews, usually of the people who respond to the survey instrument. Assessing the likely availability of interview respondents is now an important part of the pre-course planning for the course.

Each the classes -- one two-hour session each week for all 14 or so members of the class - - in the first term (Michaelmas, October to December) is split in two. The first half deals with book-learning issues. Each week there is a session (on matters such as survey design, response rate, sampling, interviewing) where one or two students prepare a paper based on the reading and we spend the remainder of the first hour discussing the literature. There is a tea break (we stay in the classroom for this) and in the second half we discuss the research project. The timing is somewhat flexible -- with emergencies or pressing issues we may spend longer on the project than on the book learning -- but usually we stick to the even amount of time spent on each.

In the second term (Lent, January to March) the two-hour sessions are more fluid. Most of the time is taken up discussing progress and issues arising from the research. In addition to the free discussion I give six sessions (of variable length) based on topics that I want to cover: the practicalities of analyzing data (including two two-hour sessions on basic SPSS, concentrating on crosstabulations) and writing up research (a session each on how data should be incorporated into analytical discussions and on basic statistical significance and association measures, above all Chi squares). I also cover the academic

publishing market and what journals look for in an article. These come at different times depending on how far along the research has come and whether we have any difficult problems with it that demand our time.

Assessment is based on a) an examination, taken in June, based on the book learning of the first term, which accounts for 50 per cent of the entire overall grade; b) an individually written assessed essay based on the book learning which accounts for 25 per cent of the entire overall grade and c) A individually written research report, based on the data collected in our survey (and any interviews) which accounts for the remaining 25 per cent of the assessment. There is no assessed collective/group project work. Grading is done on a blind double marking basis, with all pieces of work additionally being seen by an external examiner (i.e. an academic employed by another university).

The research is usually published. We publish under the name "LSE GV314 Group" and individual names, including mine, appear in strictly alphabetical order indicating equal co-authorship. We have had articles published in *Public Administration* (twice); the *British Journal of Politics and International Relations*; *Parliamentary Affairs*; *British Politics* and *Local Government Studies*. One of our reports, on whether governments "leaned" on academic researchers commissioned to evaluate their policies, was covered in *Times Higher Education* (31 October 2013, p. 7) and the satirical magazine *Private Eye* (15th November 2013, p. 9). As our students graduate in July, long before any chance to write up a report for publication, the publication is drafted after they graduate; usually around October or November (they graduate in July). I do the draft, send it to

all students who participated. Some (though very few) comment in some detail, I revise the draft, send it round again then submit it. All correspondence with the journal and additional drafts are circulated to the co-authors.

The literature on undergraduate research suggests that some features of this course might be particularly strongly expected to show the expected benefits of this type of teaching. The length of the course was identified by Craney et al. (2011: 252) as having an impact, with longer courses having, quite understandably, a stronger impact on outcomes than shorter ones. Authenticity, another characteristic believed to increase the impact of the undergraduate research experience (Craney et al. 2011: 144) the ability to show students that what they are doing is a "real" piece of research rather than something dreamed up to let students practice on something that does not matter, is much easier to demonstrate with a published record. The collective authorship is in part designed to minimize students feeling they are "slave labor ... extra hands who did repetitive work and learned specific skills but did not contribute intellectually" as this is associated with a diminution of the impact of undergraduate research (Craney et al. 2011: 147-8). A two-hour weekly meeting of participants means the collaboration lacks the intensity of contact that might be expected of one of Feldman, Divoll and Rogan-Klyve's (2013: 225) "tightly organized groups", but it might be expected to produce some of the learning gains they argue this form of research group produces as it is further away from a "loosely organized group" where "students work individually; for example, they do fieldwork ... then work individually on their analysis. Rather than having group meetings, the lead researcher will meet with students individually to discuss their progress and provide guidance".

### **Assessing the impact of an undergraduate research course**

It is hardly surprising that Seymour et al's (2003) review of the literature on undergraduate research produced, out of 51 studies, only nine where "the hypothesized benefits are both claimed and well supported", with this "well supported" term including six with under 100 respondents and none using data from respondents reflecting on the impact of their experiences on their lives and careers after they have graduated. Since 2003 there have been some more satisfactory studies, but there remain nevertheless huge problems involved in trying to establish the impact of undergraduate research and many reviews of the literature contain discussions of the shortcomings of most research strategies. Let us mention some of the most important.

First, getting comparable control/experimental samples of students who have done undergraduate research and those who have not over an extended time period is very difficult. Second, much of the data used to analyse impact, especially longer-term impacts experienced after graduation, is based upon perceptions of impact and benefits rather than verifiable measures that are independent of the respondent. Third, since undergraduate research is to a large extent a voluntary experience for undergraduates, and more highly motivated students tend to sign up for it (Russell et al. 2005: 33), there are problems of determining causality of any effects of undergraduate research -- whether variables shaping the predisposition to sign up for undergraduate research is what creates its benefits (Sadler et al. 2010). Third, while the impacts of undergraduate research are claimed to be long term, memories of educational experiences as an undergraduate fade

quickly. Indeed, one study that had managed to get satisfactory control/experimental samples found that for 22 per cent of those claiming undergraduate research experience, there was no record that they had ever done any (Bauer and Bennett 2003: 218). Fourth, and related, the further one looks after graduation for an impact the more variables one has to control for to estimate the independent effect of undergraduate research over other post-graduation socialization, learning or personal experiences and the more difficult the research task becomes. Fifth, generally post graduation studies are subject to a "halo" effect in which good experiences as a student lead one to a range of positive feelings about the effects of one's courses which can make difficult any attempt to assess particular strengths and weaknesses of any one of them (see Pike 1999). Sixth, and related to this, there is a clear selection bias in writing a paper at all or doing any research on a form of teaching since nobody is likely to want to advertise a course that is disliked by students. Few will want to publish details of their teaching disasters.

The evaluation of GV314 faces perhaps the most fundamental problem of all, common among studies of undergraduate research; small sample size. Only 68 people have ever studied GV314. This, of course also limits the value of seeking a control group as a reasonable expectation of a response rate of around 45 respondents (it ended up above this) meant multivariate analysis would be unlikely to yield significant results. This is a common feature of evaluations of undergraduate research, of the 22 empirical studies cited in Sadler et al. (2010), only six were based on samples of over 200 students/alumni. Of these only two involved respondents who had already graduated (Russell et al. 2005 and Bauer and Bennett 2003). These two significant examples which explored the impact

of undergraduate research on experiences after graduation were not cheap: each of the two studies received \$500K or more in current prices by way of National Science Foundation funding. Yet even with these two studies that looked at longer term impacts there is a reliance on student perceptions rather than independently verifiable effects.

Considering the range of existing studies suggests that any evaluation that establishes with even a moderate degree of confidence that undergraduate research brings some or all of the claimed benefits is likely to be costly and methodologically tricky. To try to produce one in the case of GV314 despite these barriers would be of dubious value. It would be unable to offer generaliseable statements about the benefits of undergraduate research because it would be based on only one course and there is only one person teaching it. Yet before acknowledging these obstacles to evaluation and retiring from the field it is worth thinking about what we would want an empirical study of GV314 to do for us.

We can start with the observation that there are dozens of empirical studies, some more convincing than others, that demonstrate, as far as it is possible so to do, that undergraduate research has positive impacts on students during their studies, and fewer that show positive impacts after their studies. Sadler et al's (2010) impressive and careful analysis of 22 major studies of undergraduate research (which includes a further 31 studies looking at research apprenticeships for high school students and teachers) offers evidence of a range of positive results (see also Seymour et al's (2003) review of 54 studies of the subject). Thus the question for empirical research in this context is not



whether GV314 can be used to prove that undergraduate research is beneficial (it cannot), but rather: does the evidence suggest that the reasonably well documented benefits of undergraduate research are being realised through GV314?

There are three areas in which this body of research has tended to suggest consistently positive results that can be explored here using the more limited data available in GV314 (see Sadler et al. 2010; Russell et al. 2005): motivation to pursue a career in science, the acquisition of skills useful in subsequent careers and generalized satisfaction with the experience of undergraduate research.

The evidence by way of assessing whether the advantages of undergraduate research can also be seen in GV314 is based on a survey conducted in April 2014. It was sent to the 68 students from the six cohorts of students who had studied GV314 since 2004. Given that response rates for studies of graduates tend to be low (for Bauer and Bennett's (2010) study it was 42 per cent) and that the universe was small, the questionnaire was kept very short and simple. With three reminders, 57 responded, a response rate of 84 per cent -- the two early years (starting 2004 and 2006) had response rates of 63 per cent, the latter four years (starting 2009 to 2012) all above 82 per cent.

### **The GV314 alumni survey**

The respondents, 29 of whom (51 per cent) were male, went into a range of different occupations. Just under half (28 or 49 per cent) went on to further study (22 had gone on to do a masters, 3 to do a PhD and 9 had studied for a professional qualification).

Government, finance, consultancy and public relations were among the most common destinations for GV314 graduates (Table 1). The varied destinations of students suggests that the course has not had much of an influence on career choices. One respondent wrote “GV314 was unlike any course I did as part of my undergraduate degree and it gave me a real taste for 'proper' research and played a significant part in me deciding to study further”. Yet it is hard to see anything in the course that would dispose students to go into government or financial services. Nevertheless, the available figures do not rule out a marginal influence on career choice. While around 22 per cent of LSE Government Department graduates according to the GEMS (Graduate Employment Market Statistics) survey go on to do further study, less than half the percentage of GV314 students, the absolute numbers remain tiny and the GEMS figures refer only to those whose immediate destination is further study, so the figures are not comparable anyway.

**Table 1 Employment sector of GV314 students spring 2014**

	N
Government	10
Finance, banking, insurance	9
Consultancy	7
Media, public relations	6
In full time education	6
Education and training	4
Law	4
Community and social services	3
Industry and engineering	1
Other	4
Not in employment	3

Perceptions of the contribution of GV314 to their education and career are likely to be affected by a significant halo effect. Overall GV314 gets a very positive evaluation.

When offered a choice of four statements, 52 (93 per cent) agreed that GV314 was both "enjoyable and useful", 3 (5 per cent) argued it was "enjoyable but not useful" and 1 (2 per cent) that it was "not enjoyable but useful" (none agreed it was neither enjoyable nor useful). There was no unambiguously negative judgment on the course to be found in any of the responses. Indeed, as we will see, the reverse is the case. The 21 write-in comments were without exception positive, many saying things along the lines of: "This was the most enjoyable course I studied whilst at university by a long mile" and "I thoroughly enjoyed the course and even more on reflection". It is, however, a more plausible hypothesis that the halo effect flows in the opposite direction to the conventional path of teacher to course. Since my personal undergraduate teaching scores are generally 0.75 points on a seven-point scale (with general bunching of scores between 1 and 3) higher (=less satisfaction) than those received for GV314, any positive judgments about the teacher are likely to be reflections of enjoyment of the course. This suggests that the format of undergraduate research might be robust enough to produce greater student satisfaction scores for many teachers.

One of the most elaborate studies of the subject (Bauer and Bennett 2003) suggested that students might claim to have experienced undergraduate research when they had not. A quarter of students in its sample claimed to have recalled doing undergraduate research without there being a record of them ever having done it. Moreover, it appears at least possible that significant numbers of those having experienced undergraduate research might not recall having done it. Therefore one must question how far experience of undergraduate research is remembered by postgraduates. We cannot easily test how much

of GV314 students remember, but when asked how much they remembered 31 (54 per cent) claimed "most or all" of the course, 25 (44 per cent) "some", 1 (2 per cent) "little" and none chose the "remember nothing" option. Unsurprisingly only one in ten of the early cohorts (2004, 2006) claimed to remember most or all, for the later years (2009-2013) the most/all option was chosen by two-thirds. When asking whether students remembered more about this course than others they had studied, 48 (84 per cent) said that their recollections were more distinct for GV314 than for other courses they took. As one put it "when I look back on my 3 years at university, it is GV314 that stands out for me by far the most. The opportunity to work in a small group directly with a professor is invaluable for a Bachelor's student whilst the exposure to senior decision-makers is a key developmental tool that no other course can offer". 9 (16 per cent) said it was no more or less distinct (none indicated the "less distinct" option). The proportion saying "more distinct" did not decline over the years. GV314 appears at least memorable.

**Table 2 Uses of GV314 post graduation**

<b>Agreed with statement ...</b>	<b>N</b>	<b>%</b>
The things I learned in GV314 have come in useful in work I have done since graduation	46	81
Having done GV314 strengthened my CV	43	75
Having studied GV314 helped me get a job or a place on a course	20	35

While all but three students (95 per cent) found the course "useful", the questions probed in what ways it was useful by asking whether respondents agreed with the statements in Table 2 (other options were disagree and neither agree nor disagree). The largest

number, 81 per cent, found it useful for the work they did after graduation, whether in employment or further study. This is close to the 75 per cent in the Russell et al. (2007) follow-up survey of US graduates who claimed that their undergraduate research experiences were useful for their work in their subsequent careers. One student wrote, for example, “I learned more directly applicable lessons on GV314 than any other course I took at LSE. I have referred back to the course a number of times in my career since graduating”. 43 (75 per cent) agreed that it strengthened their CV.

Only a minority, 20 or 35 per cent argued that it helped them get a job or a place on a course. Whether this is a high or low figure shows the limitations posed by the absence of a relevant control group such as a group of LSE Government alumni who have done a methods course without any significant undergraduate research component. However three of the write-in comments specifically mentioned that GV314 helped secure a job. For example one said;

I managed to secure a good job in the charity sector within 6 months of graduating, despite my limited experience. Since starting I have been told my knowledge of surveys was what caused my employees to select me over a more qualified and experienced candidate. My organisation had received funding to develop a large survey (16,000 recipients) but the project had stalled, I have been working on it and am due to send it out next week.

When asked which particular aspect of the course they found useful there was not much variation between many of the answers (Table 3). The least useful (regarded as useful by

26 respondents or 46 per cent) was getting the research published. This is understandable since no start was made on getting the research published until well after the students had graduated, none volunteered when asked if they wanted to have a go at writing some or all of the paper and no more than three students across all years have ever responded substantially to drafts sent to them. While publication might be an important part of a course because it makes the whole thing “real”, helps establish some degree of equality between teacher and students and maintains teacher interest, the direct learning from it is small. One student wrote: “the one suggestion I would make to this course would be to have greater emphasis on the procedure of actually getting work published, and greater participation in this.” However another wrote “I took immense pride from having my work published and it gave me a link to LSE well into my career that I treasured.”

The practical tasks of analysing and writing up research, conducting interviews as well as designing the project and the questionnaire were all regarded as useful by over three quarters, only the routine of administering the survey was marginally less valued (70 per cent found it useful). One write in comment argued

I worked as a business consultant in [a large global firm] for many years and a lot of the basics of how to structure interviews, design surveys and picking apart answers are critical

Another suggested

Although I haven't directly taken many of the skills and used them in my current job, less direct skills like thinking critically about where stats/questionnaire responses have come from, and being more confident looking at empirical data and

drawing my own conclusions from it I have used.

And a third

In my whole three years at LSE GV314 was one of the few courses I actually took which developed multiple skills; from communication (interviewing researchers) to analytical skills (statistical analysis of gathered data).

**Table 3 What students found useful in GV314**

	N	%
Analysing survey results	47	82
Writing up empirical results	47	82
Interviewing	46	81
Designing a research project	44	77
Designing a questionnaire	43	75
Administering a survey	40	70
Getting research published	26	46

When asked if there were any things students thought should have been in the course but were not, the only two replies were: "Some more in-depth quantitative analysis would have been appreciated but I understand that this might not have been feasible" and "conducting good qualitative research; relevant job positions post-course".

## **Conclusions**

None of this is proof that this particular course works and less that graduate research is the distinctive component to this course that make students say that they found it useful in their subsequent careers. It could, of course, be down to the teacher, though the available evidence from teaching scores suggest this is unlikely. Large-n

control/treatment comparisons are the closest one can come to establishing the impact of undergraduate research, albeit that they tend to rely upon reported perceptions and at best can only distinguish in broadest outline the different types of experiences of undergraduate research grouped together to produce large n samples.

Even if one accepts that there is at least a *prima facie* case that undergraduate research can produce good results, it may not be an easily generaliseable model. One commentator suggests

those who write accounts of project-based courses is typically one of small groups of highly motivated students, putting in extra hours to meet deadlines, working on the project through vacations, and continuing with the research when their formal commitment to the course has ended. These considerations raise questions about the feasibility of extending this approach to courses which are compulsory and to courses taken by larger numbers of students, and of conducting a project-based course without making inordinate demands upon both students' and tutors' time which is typically one semester (Winn 1995).

One should not overplay the effort that students are required to put in. It is possible to run GV314 with approximately the same amount of effort from students as they would put into any course. Yet the voluntary character of the course is likely to be decisive, as is the full year duration. It is not only that prior motivation and an extended experience are known from other studies to have an impact on the learning outcomes from undergraduate research. The simple fact is that a decent research project cannot be



conducted through *corvée*. One might reasonably expect a willing undergraduate to get more by way of personal development or primary source material out of a research interview than one pushed into doing it. Moreover, it is hard to design and produce a decent piece of research in ten weeks. Securing and conducting interviews, and designing, testing, administering and analysing questionnaires themselves cannot easily be condensed into a 10-12 week term or semester, and the writing up must come on top of all that.

Our assessments of our own effectiveness as teachers rely heavily, but not exclusively, on formal quality/satisfaction survey results. The regular quality assurance surveys have tended to support the view that GV314 generally works well. There are also the kinds of measures based on our perceptions as teachers – whether we like teaching the course, whether the sessions with students are fun or a drag, whether we feel that the students are getting much out of it. There are also less subjective measures of whether the students get much out of it by way of grades through formative and summative testing. On the basis of these measures too I have never doubted the course works well.

The great joy in all of this is there appears to be a dominant view among academics and university administrators that "student ratings primarily reflect effectiveness of the instructor rather than the influence of the course" (Marsh 1987; Marsh and Dunkin 1997) and good results are considered the result of the individual inspirational teacher rather than the subject or the generic method of teaching. There is good reason to think this is not the case with undergraduate research. If I were forced to offer my own interpretation

of what accounts for the good results it would not be false modesty to say that much of it is explained by the ability to free ride on the enthusiasm and capability of a small self-selecting group of highly motivated students, the flexibility to cover almost any subject with them and the excitement of finding out together something of interest that people did not know before.

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<sup>1</sup> An earlier version of this paper was presented at the American Political Science Association Annual Meeting, Washington DC, August 2014. I am grateful to Carolyn M. Shaw of Wichita State University for her constructive comments on the paper. I am also grateful to George Edwards and Martin Lodge (LSE) and Philip Cowley (Nottingham) for their help and advice. I thank the students who have taken GV314 over the years for responding to the survey.

<sup>2</sup>This is somewhat more specific than the term "research-led teaching" or "research led learning" which became a popular term in the UK after the early 2000s where it seemed to have a much vaguer meaning to include the unremarkable practice of university teachers using "examples from their own research in their teaching practice" (Patrick et al. 2011).

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