

## **Adding A Bit More Creativity to the Graduate Economics Core<sup>1</sup>**

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*The intuitive mind is a sacred gift and the rational mind is a faithful servant. We have created a society that honors the servant and has forgotten the gift. -- Albert Einstein*

Graduate economic education, especially the first year core program, is, by all accounts, a grind. The process has a bootcamp-hazing nature to it, a nature that can squeeze any nascent sparks of creativity out of most students. Its current structure is generally justified by the need to bring students up to speed in the analytic techniques used by modern economic researchers. The argument is that this core immersion approach lets students start publishing earlier, and increases economic output. Not everyone is convinced. Publishing articles is not the same as doing creative research, and there is concern among some economists that graduate school has become a way of producing efficient journal article publishers rather than efficient producers of economic knowledge.

While I expect many economists will agree that more creativity is needed in graduate economic education, I also suspect that many will be worried about added measures to increase creativity in the core; they see it more as a second or a third year problem. They see the first year as the time to bring students up to speed technically. I believe that is the wrong approach. In my view, the core involves introducing students to what is common to all economists. In my view what is common is not all students having a producer's knowledge of a set of techniques, which is what the current core provides. Rather it is having a consumer's knowledge of those techniques along with a knowledge of the broader economic cannon that informs economist's thinking.

The core involves teaching students how economists approach problems, how they creatively use models, mathematical and statistical techniques, data sets, and careful observation to provide insight into problems. Thus, it is in the core where the creativity is most central. The core should be most heavily focused on breadth, not depth. The students should learn depth, but more of that depth should come in the second and later years of their training, once the students have a broad overview of the field, an understanding of the difference between creative research and mundane research, and once they have narrowed down their interests so that the techniques they are learning are the ones that will actually be using in their research.

The structure of graduate training has evolved over time, and is not the product of the conscious decision by the profession, or even by the individual programs that what is being taught in the core should be considered the core. In fact there has been little discussion about what is meant by the core. At a recent Creativity Workshop, a group of professors and graduate students came up with the following definition of the core--the

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<sup>1</sup> I would like to thank Casey Rothschild and Avinash Dixit for helpful suggestions on an early version of this paper.

knowledge and skills that should be common to all graduating economists.<sup>2</sup> Arriving at the definition was easy; determining what the definition included was hard. The reason why is that economists play many different roles in society—teaching undergraduates, public policy, explaining economic issues to non-economists, doing what I call hands-on research (research designed to be read by non-economists policy makers), doing hands-off (research designed to be read by other economists), applied policy research, doing hands-off theoretical research, and many more.<sup>3</sup>

Elsewhere, (Colander, 2010) I have argued that in determining what is common to all economists too little weight is given to the skills and knowledge needed by undergraduate teachers and hands-on applied policy researchers, and far too much weight is given to those skills needed by hands-off academic researchers in the current structure of the core. By that I mean that the current core training is designed almost solely to train students to become producers of hands-off research, not to train students to become knowledgeable consumers of that hands-off research, so that they can translate the insights from that hands-off research into their hands-on research and teaching. I will not address those issues here, but instead will concentrate on the problem of creativity for those students the core is designed to train—future academic hands-off researchers.

Currently, the core is designed to bring incoming students up to speed as quickly as possible in the techniques and skills these students need to publish journal articles. Its structure is not designed to foster creativity, but instead tends to produce what I call “efficient journal article writers.” This strong focus on publication leads students to judge research by backward looking quantitative measures such as quality weighted publication and citation indexes, not by forward looking creativity measures. This tendency to judge researchers by quantitative measures can be seen in the comments of graduate students on a blog popular with economics graduate students when Elinor Ostrom won the Nobel Prize. One such comment was: “She has an EJ, two JEPs, two JEBOs and a couple more of that sort. Enough for tenure between the top 100 and 200.” Most were incredulous that she had won.

The problems that the core presents are different for different types of students. For those students who come in with strong training in analytic techniques used in the core, [because they have undergraduate training that was primarily designed to prepare them for graduate school (typical of many European undergraduate programs)], or because they took a Masters Program which covered much the same material (typical for many Latin American students), the first year core courses often involves repetition of material, rather than preparing them for the difficulties they will face when they start

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<sup>2</sup> The pilot Creativity Workshop was held in the summer of 2010 and was sponsored by the American Economic Association’s Committee on Economic Education, the Teagle Foundation and the Tobin Project. It had students from eight top graduate programs. We added the term “graduating” because the knowledge and skills that are seen as common to all economists likely change over time, and it is reasonable that what is seen as core changes with it.

<sup>3</sup> In a recent speech Ben Bernanke (2010) differentiated a science, an engineering and a management aspect of policy. The hands-off characterization would relate to science; the hands-on would relate to engineering. Hands-on research is generally done by government and business economists and academic consultants working of a specific problem. Hands-on research should be separated from management work, which involves implementation, not research.

their research. These students typically do well in the core, but then often are a bit more likely than others to hit a block when it comes to transferring the knowledge and skills they learned in the core to doing their own research.

For those students whose undergraduate education did not directly prepare them for graduate economic education (often because they went to an undergraduate program in economics that was designed to teach a wider range of liberal arts skills rather than to specifically prepare them for graduate school, as is the case for a number of US students), the current core all too often does not give them a true sense of the power of the techniques, nor the ability to use techniques creatively. The problem is that it is impossible to cram in that much technical knowledge into the time allotted to it. This leads to students learning the techniques superficially, but not having the level of comfort with that technique necessary to use it creatively. They learn more by memorization than by actually learning. This memorization approach succeeds when the exams consist of similar questions to those they have faced in problem sets. As one student told me, “I faked my way through a lot of the math part of the courses in classes that I didn’t care about anyway. (Colander, 2009, pg. 177) When asked what she meant, she explained—“you do it, but not really understand it.”

Such strategies become possible, in part because the core exam is usually graded by the same professor who taught that portion of the core if it is a separate exam, or because the class exam counts as the core exam. Since the exam has a time limit, the core exam questions often turn out to be “problem set lite” questions, and bright, analytical students, which all the students at top schools are, can answer the questions using the technique without really understanding the technique.

Besides not providing students with an overview of the many techniques available, the current way in which the core is taught provides students with little incentive, time, and energy to think about broader ideas, or to explore even higher level techniques. The opportunity cost of getting students to be able to reproduce a particular set of techniques is that they are not introduced to the wide range of techniques available, and the broader questions the use of a technique raises. The current training leads them to be much more likely to dot i’s and cross t’s in a particular technique in their research, rather than to explore alternative techniques.

For example, in the macro core, students learn how to solve simple dynamic programming problems (starting from the Ramsey model), and spend quite a bit of time learning programming techniques. On one level, this makes sense: to get to the “frontier” of macro research, one has to learn these foundational techniques. What is omitted is a discussion of why macro ended up using these techniques. What little history of thought there is boils down to the history of technical developments that current work builds on. But the reason techniques are used has (or at least should have) little to do with technical innovation, and much more about the *problems* that motivate those innovations. What other approaches have been tried? What types of questions is this general approach going to tend to be ill suited for? Is there anyone doing work on other approaches?

Whether you regard this other work in macro as the cutting edge (as I do) or as an intellectual backwater (as I am sure some others do), students should be *aware* of issues in non-linear and chaotic dynamics, statistical mechanics, and agent based modeling approaches by the time they are done with the macro core. Then the students can decide what is intellectual backwater and what is cutting edge.

In the micro core, students generally do not move beyond classical game theory in the core, which means that they are not introduced to some of the more creative advances in game theory such as evolutionary and epistemic game theory in the core. While it is true that to have a producer's knowledge of epistemic game theory one needs to previously have a producer's knowledge of classical game theory, that is not true for a consumer's knowledge. To many, epistemic game theory is intuitively much more satisfying than classical game theory, and a knowledge that such work is going on can motivate students to learn classical game theory as a stepping stone to an approach they might find more satisfying. The producer's knowledge of classical game theory can come in later specialist courses where the students, by the fact of having chosen to take these specialist courses, will be much more motivated to learn the techniques and use them creatively.

In econometrics, the same issues hold. The core courses in econometrics often concentrate on asymptotics of large sample statistics. This is necessary, and given that students often have had two or three econometric courses coming into the program, probably less problematic than is the case in the macro, or even the micro, core. But the producer's knowledge of the econometrics—the actual proofs—are topics that can be covered in the second and upper years, which would allow all students to get a consumer's overview of the broader set of techniques than currently are covered in the core—issues such as small sample econometric techniques, autometrics, or fractal cointegrated vector auto regression. The students could also be provided with problem sets and exercises that presented them with the heuristic problems created by using incorrect or inexact proxies.

There is no way, in the time period available in the core, that students could be introduced to the many possible cutting edge techniques available in a way that they could reproduce them. But they could be introduced to a range of techniques as consumers of the techniques. They could be shown: “Here is what creative economists are doing; we don't expect you to do it at this point, but you should be aware that it is being done, and design your studies so that you will be doing such research in one of these areas (or is some other area that you discover) in the future.” In my view, the goal of the core courses should not be to teach students to reproduce techniques. Rather it should be to provide students with an overview of the many techniques and approaches available. They should come away from the course with an overview of the the advantages and disadvantages of the many different techniques which they might use as they prepare to move on to the research phase of their training. Thus, my first suggestion for increasing creativity in the core is:

- **Professors teaching in the core should be encouraged to see their job as introducing students to the wide range of cutting edge techniques and**

**approaches that can be used to study economic questions, not just to prepare them to be producers of a specific set of technique. More of the technical training in techniques can be transferred to the field courses.**

Training designed to make students into consumers of cutting edge research, rather than to make them producers of research would make different use of problem sets and have different exams. Specifically, the exams would be less focused on reproducing a particular technique that the students learned in the course and did in the problem sets. Instead, it would focus more on explaining how a technique might be used to solve a particular problem, or might be used in a novel way that it previously hasn't been used. Technique-focused problem sets would become less important, since the exams would not be as closely tied to them, and more focus would be given to problem sets that are designed to show students how to set up a formal model and how they would use that model to answer a particular question.

Let me be clear. I am not advocating the elimination of learning techniques in the core, nor the elimination of problem sets that incorporate specific techniques. I am advocating giving more weight to the creative element of setting up and contextualizing a model, and less weight in the core problem sets to actually solving the model using the techniques used in class.

In order to understand context, it is helpful to have a sense of the evolution of ideas and skills, and how the ideas and techniques currently used developed. For example, it would be helpful for students to know that Keynes' initial work emphasized uncertainty, agent interdependency, and that there were researchers, such as Richard Goodwin, who were attempting to fit Keynes' ideas into a non-linear dynamic framework. Similarly, it would be helpful for students to know that Coase's work was designed to be an attack on the entire edifice of Pigovian Welfare economics, not to be what it became—a blanket argument against government intervention. The core currently provides students with little context for the techniques or current knowledge that students learn; students are not encouraged to see the current work in historical context, which would more naturally lead students to explore alternative techniques and approaches. This leads to a second suggestion.

- **Professors teaching in the core should be encouraged to see an important part of their job as providing context for the knowledge and techniques that they are presenting to students. This would involve more integration of reading of classic literature in the core than currently exists, and possibly the creation of a subsection of each of the core courses that is designed to provide context for the techniques presented in the other subsections.**

Teaching this contextual core will likely take more time and be less related to the research the professor is doing. In many ways the current structure of the core developed as it did to make it easier for those teaching in the core. It combined their teaching and their research, and reduced the preparation costs. I recognize that the change I am suggesting will likely involve significant effort and work on the part of the core faculty, and those providing it should be seen as providing a central service for the department. It

should be rewarded accordingly by the department. Great teaching is as, or more, important than great research in building a great department. It is great teaching that develops students who can carry on a department's legacy. For example, when Robert Solow was asked what his greatest contribution was to the profession, he said his teaching, and he is revered by his former students for that teaching.<sup>4</sup>

The previous two suggestions involve a change in what is taught to students. In many ways, what is taught is less important than what is learned by students, and what is learned depends in large part on the nature of the core exam—who writes it and who grades it. Thus, another way to increase creativity in the core is to change who makes up and grades the core exam.

For the core exam to have a reasonable hope to be a core that captures what is common to all economists, the core would have to be made up by a representative sample of economists, and would have to be graded by them as well. At one point most programs, at least in principle, saw the core exams as being made up and graded by the entire department. Through inertia, that changed in most programs so the content and grading of the core is done only by those individuals teaching in the core. The department's control extends primarily to deciding who teaches in the core.

In a recent consideration of graduate education by an AEA designated committee, the COGEE Commission (Krueger et al. 1991) suggested that the departments reassert their control, and take a larger role in designing and grading the exam. That hasn't happened. The content of the core is determined by a small group of faculty who teach the core course, and often grade that part of the core that they teach. This structure has implications. It leads students to study that professor's approach heavily, and to spend far less time on other approaches.<sup>5</sup>

Even if the first two suggestions I made were not followed, if the grading of the exam were changed, so that either a group outside examiners chosen from a group of economists whom the department believes represent the common knowledge that they want to the students to have, either made up the exam, or graded the exam made up by the professors in the course, what students learn in the core would change considerably. Instead of preparing for an exam of problem sets lite, as they do now, the students would prepare for a much broader and less predictable exam, studying all the writings of the set of likely examiners. That broader set of writings is more likely to be true "core" material than what students learn now. This change in study incentives would introduce students to more ideas, and encourage future creativity. Thus, my third suggestion is:

- **Departments should change the preparation and grading of core exams so that the core exams are made up by a wider group of economists than those teaching the core. In cases where the core and the exam have become one,**

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<sup>4</sup> One former student described a course in which Solow came in and asked what the students wanted to learn. He collected a list, and then, started a beautiful lecture on the first topic mentioned, and continued with beautiful lectures for the entire course.

<sup>5</sup> In a number of cases, the core and the course exam have become one.

**they should be separated, with the course exam becoming pass fail, and more weight given to the core exam.**

### **Less Radical Suggestions**

The above three suggestions involve major changes in the core, and I am under no illusion about their chances of implementation. I present them mainly to encourage discussion and creative debate about the core within departments. In the remainder of the paper, I discuss a number of less radical suggestions that may help increase the creativity in the core while leaving it substantially as is it now. These additional suggestions include:

- **Develop a clearing house that allows professors and policy makers, and other consumers of economic research to suggest interesting and feasible dissertation topics.**

Creativity is not an individual act; it is a collective act, and the trading of ideas is an important element of creativity. Creativity is enhanced if the different elements needed for creativity—the technical understanding of the problem, the institutional background of the problem, the data sets and empirical techniques available to answer the question—all come together. To bring these various elements together a clearing house web site of economic dissertation topics could be developed under the guidance of the AEA's Committee on Economic Education or some other representative organization. Professors and policy makers could submit dissertation-type economic questions that they believe need answering and hence that might serve as dissertation topics, along with a brief discussion of why the question is important, and the data available to consider the question.

Others could be encouraged to comment on these proposals, stating whether they believe the ideas are both feasible and interesting. A discussion with faculty could be held for students completing the core about whether any of the topics are feasible, and a group of faculty at each school could whittle down the postings to a much smaller list of topics that the professors at a school feel are worth consideration. This list could be discussed in an informal research planning seminar that might even be expanded to be an additional course offered in the core, or a second year course. In this seminar each student could be required to present an idea or ideas that they have for dissertations, and the seminar would provide feedback on the idea—what work has been done in it, whether it is feasible, what models they might use, what empirical methods they might explore. This seminar could also have upper level students and younger faculty come in and briefly discuss how they went about and chose their dissertation topic, and how they are doing on it.

- **Introduce a “Creativity Day” one day each semester**

High tech companies have recognized the need for integrating bottom-up creativity into the worker's activities, and have developed a number of ways to instill it. One way is to stop their workers from doing their normal projects and spend one day a

week thinking about, discussing, and researching, issues and problems that they think are important, rather than the projects to which they have been assigned. The day is sometimes called a Google Day, because Google uses it, but so too do many other companies such as 3-M.

The idea could be adapted to graduate economics programs, in which one day each semester could be chosen, or randomly selected, as a Creativity Day. During that day all classes would be cancelled, and instead of attending classes students would be given the opportunity to read outside their normal studies, and to consider problems that they believe need solving. Alternatively, the students could be given the assignment to come up with and provide an outline of how they would go about researching a potential dissertation topic. The students could also be left on their own, and encouraged to present and discuss their ideas with other students. The goal of this exercise would be to encourage bottom-up learning to complement to top-down learning structure in which professors guide what students are learning.

- **Make the Core Questions Much Harder and Creative, but Add More Choice to the Core Exams**

Above, I discussed current structure of the core exam encourages what I called the “faking it” problem, where the students don’t really learn the techniques in a deep way that would allow them to use it in a creative way, but rather learn them in a superficial way that allows them to pass the exam. The reason why this “faking it” strategy works is that the exams are problem set lite exams; if the professor actually asked a question that required a creative use of a technique to answer it, most of the students would fail. In many ways, the current graduate core system has to some degree become a “we pretend to learn” and “they pretend to teach” system.

Making the core exam much harder and failing most students would not be good for morale, nor would it be good pedagogy, and I am not suggesting it. With the rigorous selection methods and filtering of students at all top schools, just about all students should pass the core. Thus, if one asks hard question on the core, one would need to allow much more choice on that exam than is currently allowed. Students could choose, say, one of six questions (of various types and styles) which might cover different aspects of the course, and different types of understanding. Some questions could be based on problem sets; others could be more creative. Still others could require a deep knowledge of the literature. Such a change in the structure of the exam would significantly change student’s study strategy, and lead them to think more creatively about the material.

- **Create a Creativity Bootcamp for students when they finish their core exams.**

If programs do not want to change the nature of their core program, but believe that they want to add more creativity to their program, they could create a Creativity Bootcamp that students would be required to attend either after completing their core exams or after completing their second year of study. This creativity Bootcamp could be designed to provide context to students by discussing the history of the ideas they learned, and provide a survey of more advanced techniques, and how creative researchers are



using those advanced techniques to try to answer questions. The Bootcamp could be specific to a school, but ideally would be joint with a number of other schools, so that students can interact, and perspectives and alternative techniques could be shared. The pilot Creative Workshop held in 2010 suggests that such a program is feasible and worthwhile.

- **Add a self-directed summer reading list (and create a test of that reading)**

Any feasible bootcamp will be too short to actually present students with more than an introduction to the many ideas out there. To make it more meaningful, it could be combined with a core reading list that would be required reading for the creativity workshop. This reading list could be broad-ranging and be designed to introduce students to both different ideas, and history of the ideas that all students should know. Providing students with this reading list would be generally seen as desirable by students. Students recognize that their studies are often limited and narrow, and many intend to read more broadly, but under the pressure of time, generally do not get around to it. There could even be exams on this reading list, which need not be graded, but would be provided to prospective employers who ask to see them.

- **Provide Funding for Student Designed Debate Idea Face off Day**

One of the reasons for the lack of creativity is that students are not really presented with the rough and tumble debates that bring out creativity, or at least get the creative juices flowing. They seldom see a “go for the jugular” debate between the strongest advocates of views. Instead, they generally see one side create a straw dog of the other position, and destroy it. The problem is that academic fighting often involves “gentlemanly” fighting rather than street brawls. Academic punches come in slow motion. The advantage of this “slow motion” approach to academic debate is it is much more conducive to careful thinking and civility. The disadvantage is that it too often leaves the real issues at debate unsaid, or leaves them between the lines. All too often the true views of economists do not clash.

The primary exception to this approach was the Chicago approach that goes back to John Laughlin, Milton Friedman and George Stigler, remnants of which still remain today. That Chicago approach had its problems, but it did help foster creativity. To introduce more of that approach to graduate school, once a semester, students could be allowed to design a panel discussion program in which they bring in a researcher or group of researchers from another school or institute that they believe might raise fundamental questions for the approach they have been taught. These researchers would provide a presentation of their alternative approach, and then an internal professor would respond. Examples of face offs that I have in mind might be David Hendry debating Thomas Sargent, Alan Kirman debating Patrick Kehoe, Gary Becker debating David Laibson, or Edward Leamer debating Avinash Dixit. These debates could be videoed and made available to students at other programs.

- **Interprogram Student Exchanges**

For a profession, one of whose central insights is that there are enormous gains from trade, there is far too little focus given to how trading of ideas can be expanded. If the “debate face-offs” among professors are too controversial for programs, some interchange of views can be achieved by increasing the interaction among students from different programs. This could be done by a formal exchange of students from different programs, where students from one program travel to an alternative program for a week, a month, or an entire semester, or by a program such as joint Creativity Bootcamp, jointly supported by a group of programs, where students from different programs can interact and exchange ideas. Post doc provide some of that now, but there could also be Pre Docs as well.

- **Coffee Hours (Friday Night Beer and Wine Evenings)**

Let me conclude with my least contentious suggestion. Education is much more than formal class work. The reality is that informal discussions are often more productive in learning than is formal classroom discussion. The more informal interaction between students and faculty, the better for creativity and for learning generally. Thus, even if programs don’t adopt any of the above suggestions, each department should develop, support, and subsidize programs that encourage and promote informal interaction among faculty and students. Possible venues for interaction include inviting students to visitor lunches and dinners, afternoon Frisbee or soccer, after seminar Friday night beers, Thursday night pizza, Wednesday wine, Monday coffee hour.....

## **Conclusion**

The most important role that economists play is their teaching. Teaching is the replicator dynamics of the profession. The structure of what is taught significantly influences how future economists think and how they approach problems. Given its importance, far too little time is devoted to teaching. To me, and to many economists that I speak with, the current structure of graduate education, particularly the core, does not teach what most economists believe should be common to all graduating economists. It is both too hard and too easy—too hard if students were really required to understand the material they are being taught in a way that they can use it creatively—too easy in the way it is tested, which allows students to pass the exam, without having a deep understanding of the techniques. If more focus were given to creativity, and a better balance between techniques and creativity were found, the core training of economists could be significantly improved.

Even though I don’t know what creativity is, I do know that it is important. I believe that if they were adopted, the suggestions in the paper would increase the creativity in economic programs, and lead students to value creativity more than they currently do. I am under no illusion that they will be adopted. But even if none of the suggestions are adopted, I believe the conversation about them will be beneficial, and may lead to alternative suggestions and programs designed to increase creativity in economists.

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