Accessibility and Relevance of Quantitative Methods in Economics

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Introduction

This paper argues for a review of the Economics teaching of quantitative methods in two directions. On the one hand, to improve its accessibility and relevance which are often argued to be one of the pillars of the decolonisation of curricula across disciplines. And on the other, hand, to include other methodologies to reflect the heterogeneity of schools of thought in the discipline.

This paper invites a reflection of how undergraduate and postgraduate econometrics is taught, as we face unprecedented data processing and computational and technological powers, and in a world where information is widely available and often confounded with knowledge. It will firstly discuss and illustrate how teaching guided by models of learning and keeping the student and learning outcomes in mind can be successful and adaptable alternatives to the status quo, and a step towards decolonisation.

Secondly, the Economics QAA benchmark (Quality Assurance Agency, 2023) only acknowledges Econometrics as a sufficient research method in the Economics curriculum. However, developments in the scope and relevance of heterodox and alternative to mainstream schools of thought in Economics require the discipline to recognise the value of other methodologies as core to progressing knowledge, and to actively engaging and influencing the direction and continuing relevance of the discipline into the future.

Keywords: Decolonisation, equity of knowledge acquisition, student centred and active-based learning models, Pluralist and Heterodox Economics, inductive and deductive methods, quantitative and qualitative methods, exploratory and confirmatory research designs, constructive alignment,

1. Stripping layers of obscurantism from Econometrics and statistics teaching

It is often argued that effective and transformative decolonisation in teaching and research requires tackling three pillars: accessibility, representation and accuracy. While other papers in this volume will make a strong case for the importance of transformative representation, inclusion and rightful acknowledgement of knowledges, and for accuracy or the absence of historical and power-driven biases (see e.g Zwiener-Collins et al., 2023 and Olsson, 2023) in the teaching of quantitative methods in Social Sciences, this paper focusses on the practice of decolonisation via the accessibility and equity of knowledge acquisition. Education is often argued to be a tool for upward mobility and poverty reduction (Boateng, 2014) but it can be used to deepen social hierarchies (Bourdieu, 1973), especially if curricula remain taught as when they were first developed, in a context where education was the privilege of a few, often wealthier and white men. This section will argue for the need to review the ways in which we teach quantitative methods in the UK, with the goal to strip away any unnecessary language, notation, or level of obscurantism which heavily relies on a path dependent elitist educational route, but which will be argued to be only peripheral in the teaching of key learning outcomes. To do so, both well tested models of teaching as well as models of learning are important, and so are considerations of resources and technologies available to teach. As discussed in Hofmeister and Mccullick (2016),

> Teaching models […] encompass theory, student and teacher interactions, domain priorities, instructional themes, research support, and valid assessments. Models allow teachers to deliver material using more organized, theory- and evidence-based approaches. Expert teachers often have an eclectic

> approach that incorporates models as well as techniques not contained within models, but new and less skilled teachers may need models to ensure they are not "missing" critical components of teaching that lead to learning. (p. 271)

And may I add, evaluating the effectiveness of teaching may require its conceptualisation.

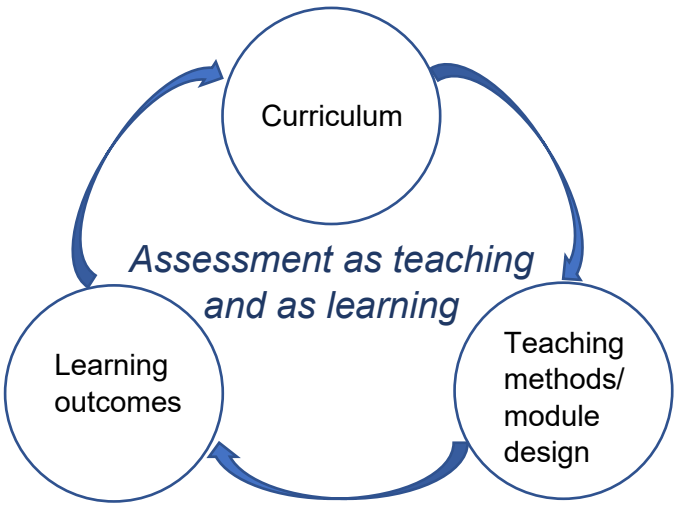
While most teaching in the UK is done in classrooms and lecture theatres, the learning by students benefits from alternatives to traditional lecture-based teaching, and tutor-led exercise-solving support. This overcomes the difficulties learners with lower social economic status or access to resources, as well as those for whom mathematics is too devoid of content to be relatable (all of which indirectly and disproportionately affect Black, Asian and Minority Ethnic (BAME) learners more), find in succeeding at mathematics (Aguilar, 2021). In particular, since most teaching is based on textbooks which require previous knowledge of mathematics and statistics, and of its language and notation, and is often led by this assumed shared language.

Kolb's learning cycle model (1984) defines learning as a process of abstract and concrete activity, building on reflection, making mental connections to related topics, making decisions, acting and then reflecting upon consequences of action. This model encourages active and enquiry-based learning, personalised learning, and is often enhanced by experiential and collaborative activities. Current curricula and teaching are often heavily content driven and do not leave room for creating learning spaces for students as individuals or in a group.

According to Biggs (2003), effective teaching however requires learners to build up and construct their own learning, with a clear sight of the direction of travel. With Biggs' notion of constructive alignment, teaching becomes the facilitation of learning and not an end in itself. Biggs' constructive alignment mirrors the principles of self-directed, self-reflective, student-centred learning and teaching in Nunan and Lamb (1996).

Assessment, formative and summative, become an integral part of the learning journey, and are used to further and deepen learning.

Assessment which is designed and planned together with the triad below becomes as much teaching as it is learning.



With a constructive alignment approach to producing a module, assessment - both formative and summative - culminates in both teaching and learning.

Fialho (2024) discusses the perspective of the educators when thinking about the decolonisation of quantitative methods teaching. A key difficulty is the letting go of the syllabus as a guide to teaching, and to focus instead on the key learning outcomes they should achieve, or on which they are being assessed. For instance, and as an example, let's consider two approaches to teaching hypothesis testing, when the learning outcome is the *application* of a statistical test to different problems:

a) Presenting the test statistic to students, deriving its statistical distribution, and by defining type I and type II error, explaining the confidence and critical regions, the critical value, and the workings of the test. Once the theory is explained, students can practise by repeating the mechanics of the statistical test for different applications.
b) Presenting a problem which requires a test; students experiment with generating a relevant sample, and try samples of different sizes, and from distributions with different variability to see how these parameters matter for the shape of

the distribution (and ultimately, for the power of the statistical test); using simulations, students can see the impact of the shape of the distribution on where the test statistic lies relative to the true value; the mechanics of the test and general result are then drawn out from this set of activities.

The content is heavier in approach a) while the attainment of the key learning outcome is deeper in approach b).

Accessibility of quantitative methods, in particular of econometrics, and in a context where ICT technologies and generative AI facilitate access to and replication of existing information, requires the development of critical engagement and a break in the transmission of the same content from cohort to cohort of students as well as of educators. Content-heavy statistics and econometrics curricula need to be reviewed and stripped down to core learning outcomes to equip learners with a more relevant and accessible skill set, and ultimately to comply with the 21st century skills framework (Joynes et al., 2019).

2. How can Economics remain relevant and generate new knowledge?

Many cohorts of students graduating in UK universities have repeatedly used Econometrics as a way to test an economic theory. Research results are often discussed in terms of the strength of the evidence in favour or against a null hypothesis, and the analysis and discussion section of an applied economic paper will analyse if any statistical evidence survives a thorough list of robustness checks. This is brought into question in this paper for several reasons. Methodologically, because confirming or rejecting a pre-existing hypothesis adds little to the knowledge and scrutiny economic theory requires to remain relevant in a fast-changing world. Recent events and crises have shown that economic theory and policy respond weakly (if at all) to evidence which established theories cannot explain. During the 2007-2008 financial crises, many renowned economists and policy advisors had very little to say about the emergence of this crisis, other than *we did not see it coming*, or

the notorious Greenspan “I found a flaw” quote (Beattie and Politi, 2008). While both the economics teaching curriculum in terms of economic theory, as well as the policy instruments used in practice were modified as a result of the crisis, little has occurred in terms of questioning the knowledge generating systems of higher education institutions (or challenging the structural power relations as Davidson (2024) defines these), which continue to rely almost exclusively on econometrics, and almost exclusively on confirmatory and deductive approaches.

The argument that the economics curriculum and economic theory cannot be decolonised while knowledge progresses mostly with confirmatory analysis conducted on global north’s data is an argument recently made by many scholars (Held, 2019). And here Global *North* is being used as a shortcut for countries such as the US, UK, Germany, or Australia, whose data populates the vast majority of published work in top Economics journals. Many scholars have challenged this perpetuation of relevant knowledge by using data from the Global South instead and by signalling the extent to which data and research done on the Global South is often a form of colonisation itself (Davidson, 2024). So until research opens up and invites knowledge generation based on evidence and the realities from the Global South, and while data itself and what and how variables are measured need to remain *comparable* to existing data produced in the Global North, advances in knowledge remain limited and not contested enough. As an example, standardizing the measurement of work across the globe, has meant leaving unpaid work out of the definition of work which, in the Global north, is concerned and for historical reasons, only with work performed to generate national income and output. Leaving out unpaid work and unpaid care is a disservice to large segments of the world population whose work is not compensated via marketable exchanges, and in particular to women for often being the ones staying at home. Only recently the International Labour Organization (ILO) is reviewing its definition of work to include unpaid work, including unpaid care), after two centuries where dominant research approaches have defined work as paid employment (Watson, 2024).

Heterodox and pluralist Economics is the umbrella term for all other than mainstream Economics. Keynesian Economics, while popular between the end of the Second World War and the global economic crises in the 1970s, has been revived by post-Keynesianism and neo-Keynesianism. Marxist Economics has been added to the curriculum of some universities. And so has Schumpeterian ideas. These alternative schools of thought not only use econometrics quite sparingly, they also rely on a wide array of data formats, and a wide array of research methods beyond econometrics, which include primary and secondary qualitative methods, as well as quantitative computationally intensive agent-based modelling (Mearman, 2012). And while ideas from heterodox Economics are permeating universities, left wing party electoral programmes, and central banks' economic models, the discipline's quality assurance benchmarks lag behind by not recognising the value of training current and future Economics graduates with alternatives to econometric deductive methods. According to Sabaratnam (2011),

> Decolonising strategies, through pluralising the subjects of inquiry, offer an intellectual platform for making good the ambition of a discipline that has been trying to transcend its imperial, colonial and racist roots. (p.17)

Social inquiry cannot be pluralised and remain relevant if methods of inquiry are not.

3. Conclusion

This paper has made two contributions. By discussing experiential and constructivist methods of learning, it proposes an improvement in the accessibility and equity of quantitative methods teaching in the Social Sciences and in Economics in particular, via a focus on learning outcomes and more student-centred teaching strategies. This shift would comply with the 21st century skills framework this discipline is still mostly unresponsive to.

The second contribution is to emphasise the need to decolonise the Economics curriculum also via the engagement with alternative to mainstream schools of thought which cannot be done without

reviewing the methods of inquiry of the discipline. As long as the Economics benchmark only recognises Econometrics as the research method all Economics degrees need to engage with, and excludes the need to engage with the multiplicity of methods in social enquiries, decolonisation remains an option and not a moral transformative reform.

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