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The use of social networks to improve student engagement and implement a research-led curriculum

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The use of social networks to improve student engagement and implement a research-led curriculum.

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Abstract

Integrating research and teaching in higher education is a challenging yet important issue. Whilst evidence suggests that research quality in economics often correlates negatively with student satisfaction, incorporating research into the curriculum generally enhances student motivation and grades. We implemented an Instagram account as a supplementary resource across 4 courses in 2 universities. The account aimed to (1) introduce research-led teaching activities, (2) boost engagement, and (3) connect teaching to students' real lives. Our findings reveal a positive link between student interaction with the account and improved percentile ranks, higher final grades, and successful course completion. This effect was notably stronger among students with specific learning difficulties.

Keywords: social networks; education; engagement; research-led teaching

JEL classification: A11; A2.

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1. Introduction and Literature Review

The COVID-19 pandemic forced universities to rapidly source alternatives to conventional in-person teaching delivery. The latest results from the Student Academic Survey in 2023 suggest that a large percentage of students now prefer blended learning based on a combination of face-to-face and digital teaching[5]. Perhaps more importantly, the pandemic highlighted the necessity for innovation in a traditional system that was lagging behind this generation of student's appetite for a more digital-led teaching approach.

This paper studies the use of social networks as a way of (1) introducing research-led teaching activities, (2) increasing engagement, and (3) relating teaching to students' real lives. We study the effect that using social networks has on students' engagement and economics literacy beyond the course material—dynamically adapting to the needs of the current generation of students.

During the academic years 2022/2023 and 2023/2024, we introduced an Instagram page (@dailylifeecon) to complement the learning experience of students in various economics courses at the University of Manchester and Lancaster University. We used Instagram features in several ways. Using posts, reels (short videos up to 90 seconds), and stories (posts available for 24 hours), we engaged the students ahead of the lecture, trying to attract their attention and motivate them to increase engagement; we linked the content to case studies and academic papers promoting an active research-led curriculum, and, complementary to academic teaching, we outreached economics to the public. Our findings indicate that student interaction with the Instagram account was positively associated with improved percentile ranks, higher final grades, and successful course completion, with particularly strong effects observed among students with specific learning difficulties.

The digital provision at the university level, combined with a more traditional teaching approach, has shown to be beneficial for both students and lecturers (Mishra et al., 2020). However, it has also made more evident the weak points of the traditional system, such as the disengagement from the students (Chipchase et al., 2017; Pham et al., 2022). In recent years the scale of discontent that students have with the way they are taught economics at university has given rise to several societies which call for an overhaul of the way their subject is taught[6]. This is particularly relevant now, especially in UK institutions, as students finance over 50% of

[5] https://advance-he.ac.uk/knowledge-hub/student-academic-experience-survey-2023
[6] https://www.theguardian.com/education/2014/may/04/economics-students-overhaul-subject-teaching

the school's and departments' costs[7], so it seems natural that more weight and importance is put into the teaching focus aspect of the UK universities.

The subject of economics has one of the highest staff-to-student ratios. However, the overall weighted average unit cost for a full-time provision is one of the lowest at the subject level[8]. The vast funding coming from the students in the Economics Departments is used to cover the teaching cost, departmental running costs, student-related central services, corporate services, and estate and sustainability, but also to provide research time and funding for academic staff. This last point emphasises the need to bring together teaching and discipline-based research (see, for example, Jenkins and Healey, 2009; Serrow, 2004).

Past research across academic disciplines suggests that the integration of research in higher education teaching has positive results in both student motivation and final grades in different areas (see, for example, Boyer, 1990; Kinkead, 2003; Land and Gordon, 2013). Whilst this indicates that, from the student perspective, research-led teaching may be a worthy goal for UK universities, in practice, there are multiple approaches to research-led teaching which have different implications for the student learning experience. Zamorski (2002) suggests that there are two options when introducing research into higher education teaching: (1) students act as an audience, and (2) students are actively involved in conducting and critiquing a research activity. Within these two categories, Healey and Jenkins (2009) go one step further and make subdivisions for the implementation of research-led teaching: (1) students passively learn about the research discipline, (2) students engage in the discussion, (3) students develop research skills and techniques, and (4) students undertake research and inquiry. Many of these options require an active learning activity that involves the students. Some authors show how the re-use of past data is vital when combining research and teaching (Griffiths, 2004; Haaker and Morgan-Brett, 2017), trying to make teaching relevant to students' real lives (Pfeiffer and Rogalin, 2012).

However, in practice, although economics teaching claims to be research-led, this is largely implemented in a passive learning style and is sometimes inappropriate for the level, leading to a disconnect between educational theory and effective student engagement. This is particularly relevant in large lectures, where multimedia support can help mitigate this issue (Roberts, 2017). We propose the introduction of social networks, specifically Instagram which students regularly use, to introduce research-led teaching in the curriculum. To help students

[7] https://www.hesa.ac.uk/data-and-analysis/finances/income

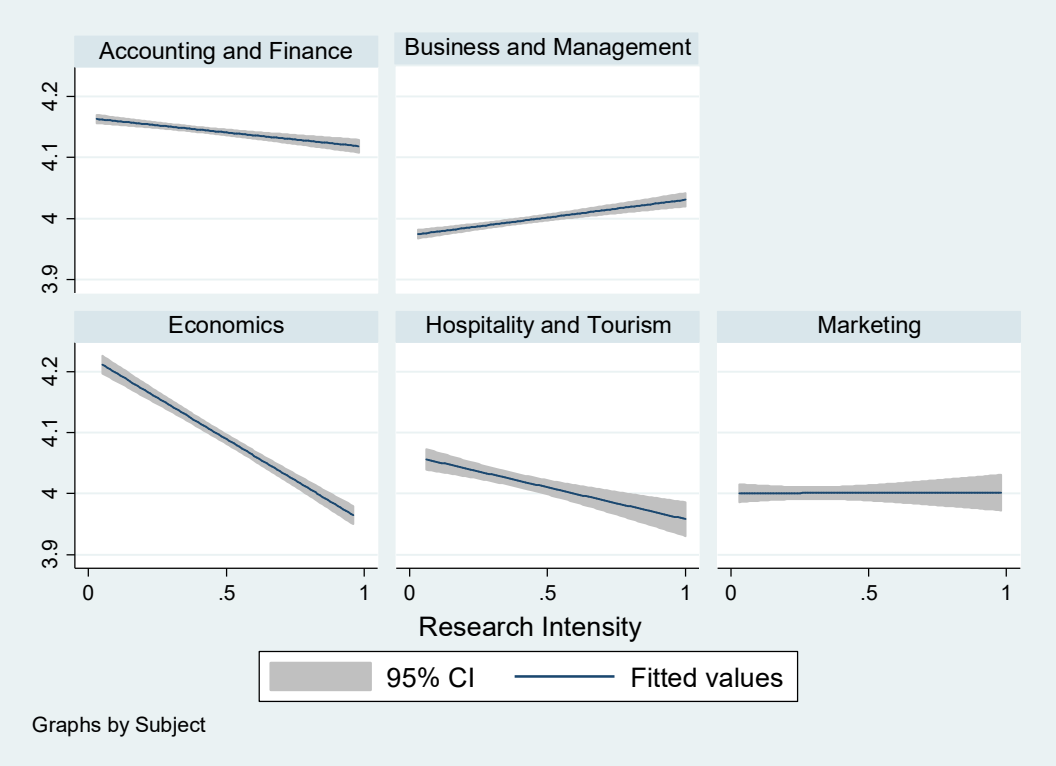
[8] Medical, dental, and veterinary science is the subject group with the highest weighted average unit cost) (KPMG LLP, 2019).

engage with the curriculum and relate to economic concepts, we use examples and situations that we encounter in our daily lives.

2. Motivation

The UK National Student Survey (NSS) gathers final-year students' opinions on the quality of their courses[9]. The NSS measures final year students' satisfaction related to student's academic experience, such as quality of teaching, learning opportunities, assessment and feedback, academic support, organisation and management, learning resources, learning community, and student's voice. Yearly this is conducted across 130 UK higher education institutions for different disciplines. On the other hand, the Research Excellence Framework (REF) measures research intensity as the proportion of staff involved in research. The REF is a system used to assess the quality of research in UK higher education institutions. The REF is conducted every 6 to 7 years. Figure 1 displays the linear relationship between student satisfaction and research intensity for different subjects. Whilst the relationship is clearly subject dependent, Economics has a clear negative correlation.

Figure 1: Relationship between student satisfaction and research intensity (2008 to 2021)



Notes: The vertical axis measures Student Satisfaction. Students are asked to rate from 1 (definitely disagree) to 5 (definitely agree) their overall satisfaction. The horizontal axis measures the Research Intensity as the proportion of staff involved in research within a department. Source: NSS and REF datasets.

[9] https://www.officeforstudents.org.uk/advice-and-guidance/student-information-and-data/national-student-survey-nss/

The REF measures different aspects of research quality and impact and above, we consider research intensity, which is the proportion of staff involved in research within a department. However, even though research intensity is correlated with research quality, we also analyse the statistical significance of the relationship above and whether the same relationship can also be found when looking at research quality in the relevant subjects. Using an Ordinary Least Squares (OLS) methodology, we look at the relationship between the variables using the following model:

$$S_{it} = \alpha_0 + \beta_1 R_{it} + \beta_2 \delta_{ij} + \epsilon_{it} \qquad (1)$$

where S_{it} represents the student satisfaction for subject *i* and year *t*. R_{it} measures research intensity or quality for subject *i* and year *t*. δ_{it} is a set of dummy variables to control for subject and year-fixed effects. ϵ_{ijt} is the error term. Table 1 shows the results, columns 1 and 2 consider all the subjects, and columns 3 and 4 show the results for the Economics subject area. In columns 1 and 3, the independent variable is research intensity, and in columns 2 and 4, research quality. We can see that the correlation between student satisfaction and research intensity or research quality is statistically significant. In the case of research quality, it is positive when we consider all the subjects, but it is negative, similar to the results relating to research intensity, for the specific subject of economics, indicating a disconnection between research intensity and quality and student satisfaction across institutions for economics.

Table 1: OLS Student Satisfaction, Research intensity, and Research quality

	(1)	(2)	(3)	(4)
VARIABLES	Student satisfaction	Student satisfaction	Student satisfaction	Student satisfaction
Research intensity	-0.0677***		-0.276***	
	(0.00526)		(0.0139)	
Research quality		0.0191***		-0.0102**
		(0.00173)		(0.00441)
Year fixed effects	YES	YES		
Subject fixed effects	YES	YES		
Constant	4.079***	3.998***	4.147***	4.050***
	(0.0106)	(0.0111)	(0.0276)	(0.0277)
Observations	17,373	66,228	3,188	11,065
R-squared	0.130	0.271	0.132	0.169

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. The dependent variable is the student satisfaction for subject *j* and year *t*. Column 1 and 2 considers all the subjects, and columns 3 and 4 are the results for the economics subject area.

Different factors may be relevant to these results, particularly why students may rank lower in economics compared with other disciplines. Students' expectations when entering the course may not match the actual content, indicating a problem of moral hazard (Akerlof, 1970). While

it is not the purpose of this paper to analyze these details, this discrepancy serves as a motivation to adapt our teaching to a more engaging and active research-led curriculum.

3. The Use of Social Networks to Implement a Research-led Curriculum

The landscape of academia has witnessed a transformative shift with the integration of social networks in the past years, offering new avenues for scholarly communication, knowledge dissemination, and student engagement. The importance of the use of technology has become even more relevant during and following the COVID-19 pandemic. A range of studies has delved into this phenomenon, contributing to a comprehensive understanding of its multifaceted impact.

The benefits of the use of social networks in academia have been demonstrated for both students and academics. Nandez and Borrego (2013) investigated the motivations and profiles of users of academic social networks. They found that social networks facilitated interactions among academics and PhD students, who harnessed the platform to connect with peers, share research findings, and access scholarly resources. Meishar-Tal and Pietersen (2019) also highlight their popularity among academics as a platform for self-promotion, professional knowledge acquisition, peer community belonging, and interaction.

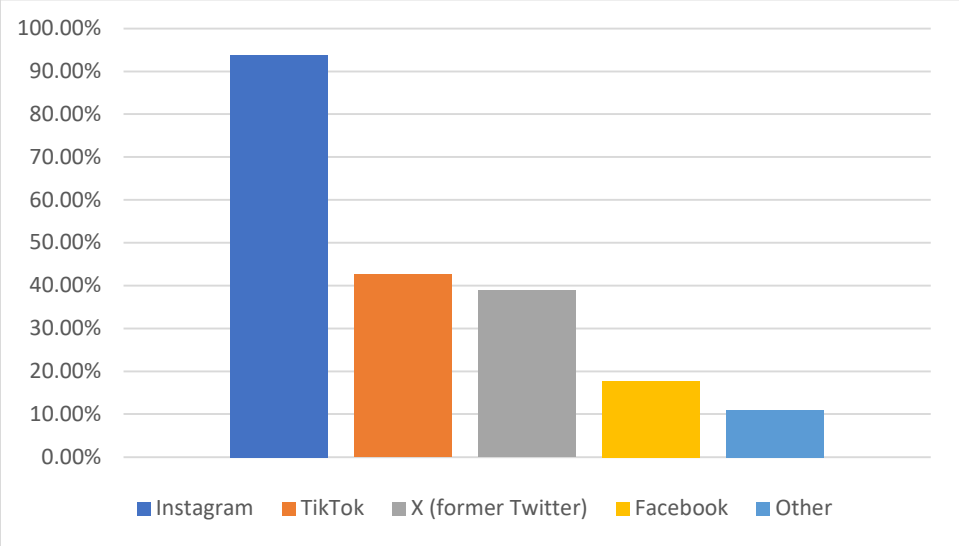
The trajectory of academic integration of social media has extended beyond physical classrooms. By leveraging social media tools, educators have facilitated diverse forms of learning engagement, ranging from collaborative learning and reflective practices to inquiry-based learning, extending into the realm of distance education in different disciplines (Deng and Yuen, 2010; George and Dellasega, 2011; Junco et al., 2010). These activities have provided insights into the increased collaboration, communication, and interaction that social media platforms can offer whilst also helping educators embrace diverse tools like blogs and wikis to facilitate collaborative learning and community building among students (Guy, 2012).

Dabbagh and Kitsantas (2012) and Middleditch et al. (2022) advocate the use of Personal Learning Environments (PLEs) enabled by the social media platform X (formerly Twitter), to aid formal learning while allowing and promoting self-learning. Their pedagogical frameworks underscored the potential of PLEs in shaping compelling educational experiences. The use of X as a means to facilitate large-scale case discussions has been showcased in different studies (Jones and Baltzersen, 2017; Al-Balhrani and Patel, (2015,2017).

Emerging from this research, our paper studies the use of Instagram to bridge academia and students' real lives. In doing so our approach aims to connect research-led teaching activities,

engagement enhancement, and real-world relevance through reels, posts, and case study repositories. This aligns with Generation Z's affinity for Instagram as a valuable educational tool[10]. In this context, it's noteworthy that despite the need for Instagram users to sign up, its widespread usage among Generation Z[11] highlights the role it already plays in students lives. The results of our pre-exposure questionnaires[12] confirm the platforms popularity with our students indicating that Instagram is their most used platform social networks they regularly use (see Figure 2). Nevertheless, whilst Instagram's widespread adoption emphasizes its potential as a prominent educational platform, our proposal is easily transferable to other social networks making it adaptable to future trends in the sector.

Figure 2: “Which Social Networks do you regularly use?”

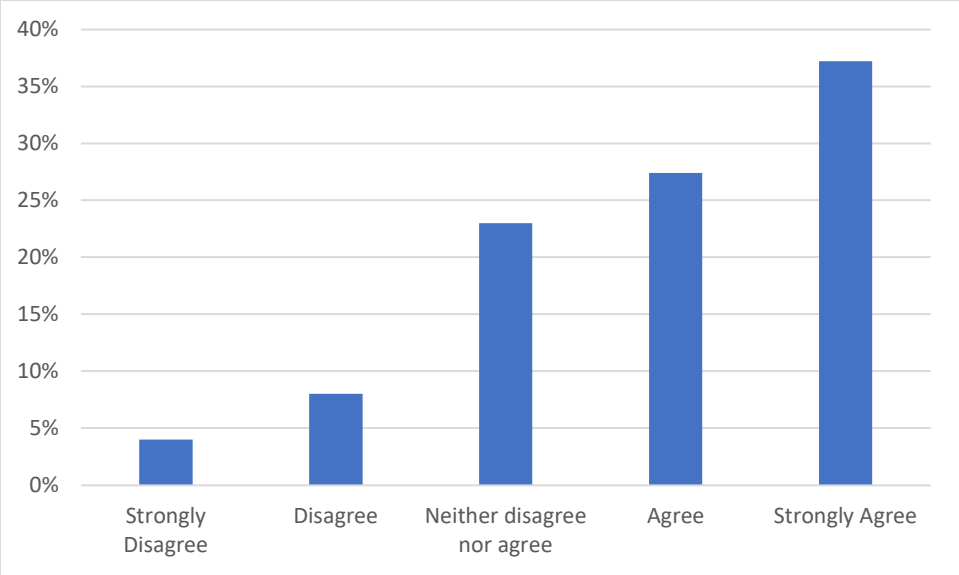


Note: Surveys from different sources confirm these results. A Morning consulting survey data collected in 2024 shows that, after YouTube (whose purpose is different compared to the platforms in Figure 2) Instagram is the most widespread social network for all genders[13]. Other surveys, such as Statista, provide very similar recent data, highlighting YouTube as the most used social platform by Generation Z and Instagram as the second most used.

It was important for us to gauge whether students also saw a potential for using social networks in the classroom to traditional teaching. Figure 3 displays the response to this question which was broadly positive with the majority of students (64.6%) agreeing and only 12% disagreeing with the use of social networks as a complementary tool to their learning.

[10] See recent Rethinking Economics groups evaluation reports of universities across the UK and some globally such as the US: https://www.rethinkeconomics.org/edu-material/
[11] Generation Z current ages between 13 and 25 years old
[12] 121 students answered the pre-exposure questionnaire between the University of Manchester and Lancaster university.
[13] Find the Morning consulting results here: https://later.com/blog/gen-z-social-media-usage/

Figure 3: “I regularly use social networks, and I think it is a good idea to complement traditional teaching”



3.1 Economics Around the City (@dailylifeecon)

For the Academic years 2022-2023 and 2023-2024 we introduced an Instagram page (@dailylifeecon[14]) as a complementary tool for students learning in the courses: Principles of Microeconomics 2 (University of Manchester); Managerial Economics I (University of Manchester); Microeconomics 4 (University of Manchester); and Monetary Macroeconomics (Lancaster University)[15]. The four courses were taught in the undergraduate economics programs of their respective university. However, students from different degrees could take some of these courses as optional. The courses were also taught across different years in the degrees, Principles of Microeconomics 2 – year 1, Managerial Economics I and Microeconomics 4 – year 2 (with some year 3 exceptions), and Monetary Macroeconomics – year 3. A total of 1,478 unique students were taught across the courses and both academic years[16].

Students were not obliged to follow the page; this was complementary material which they could access on a voluntary basis. Additionally, only content that was relevant to the teaching material was embedded in the teaching interface system[17]. However, students who follow the

[14] https://www.instagram.com/dailylifeecon/
[15] During the academic year 2023/2024, we also introduced the Instagram account in the postgraduate course Money, Banking, and Finance at Lancaster University. However, as we don’t have data for both academic years, this course was not included in the dataset.
[16] 258 students took both Managerial Economics I and Microeconomics 4. The timing of the interaction with the account for these students allowed us to relate to the relevant course.
[17] The Teaching Interface System refers to the online platform used for course management, such as Blackboard or Moodle. This platform includes the content relevant to the course material.

page on Instagram are more likely to be exposed to the content on a regular basis, independent of whether the content on a specific week is related to their course. We also provide free access to a resource website with additional material linked to the Instagram content where the students (and educators) can access case studies and other material, which explores the concepts in more depth[18].

Instagram allows for a variety of content through posts, reels and stories. Instagram stories are short visual posts available 24 hours which we used for quick questionnaires ahead of lectures as a means to introduce or get students thinking about the topic. For example, the day before the students were learning about inflation in Monetary Macroeconomics, the lecturer uploaded a story asking them in a poll about the increasing prices of their students' shopping baskets. This not only gave them an idea about what the lecture will be about that day, but also how it's relevant to their daily lives. In contrast we used Instagram posts (which remain on the platform and are up to 2000 characters long) and reels to increase engagement and promote a research-led curriculum. Case Studies 1, 2, and 3 explain in detail how this was done.

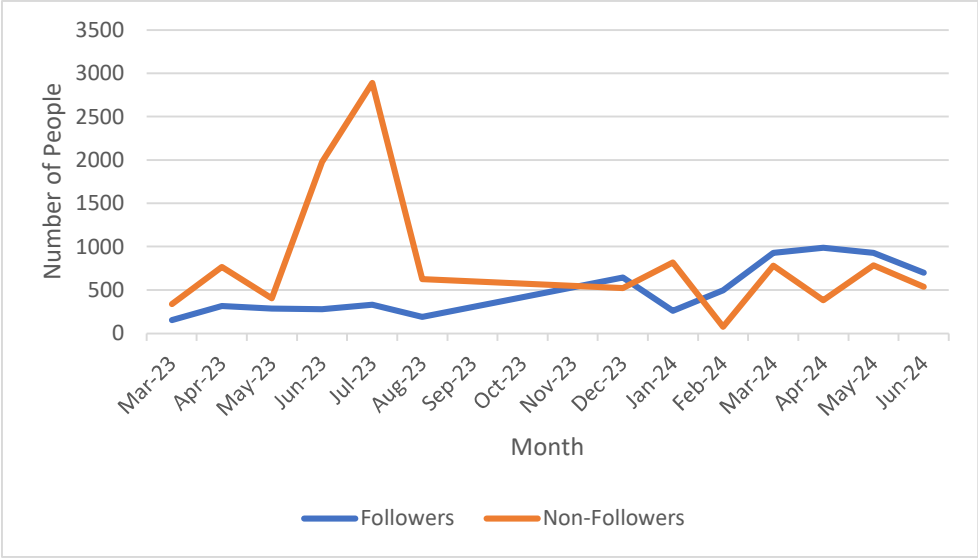
A creator's Instagram account allowed us to collect monthly data related to engagement and accounts our content reaches. Figures 4 and 5 display the number of unique users who have seen our content (accounts reached). We collected data on the weekly interactions per post and subject for both followers and non-followers[19], which could involve not only students but also other interested users. Figure 4 shows that especially observing the pattern of followers, they reach the content even when the teaching term has finished; we find this particularly interesting as it shows the increasing interest in economics when the concepts are related to the students' real lives. In a post-exposure questionnaire to our students at the end of the course[20], students were asked whether they were following the account and, if not, if they were still accessing and interacting with the content; 53.7% of students who answered the questionnaire were not followers. However, 38.8% of those students reported they still interacted with the account during the course.

[18] https://sites.google.com/view/dailylifeecon/home

[19] 19.4% of the students followed the account. There are 36 followers who we can see from their profiles they are students at either the University of Manchester or Lancaster University, and we cannot match them with the students' lists as their Instagram handle is different to their real names or their name is not in our student's list. There are some followers who are not our students, as it is an open account outside people to our courses can also follow or interact with the content.

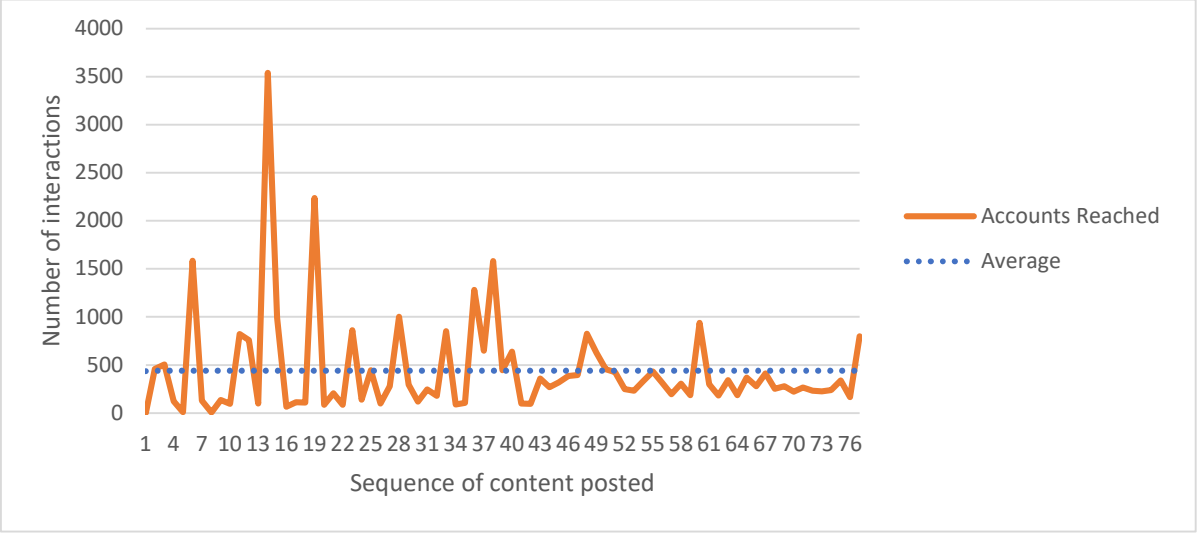
[20] 81 students filled in the post-exposure questionnaire.

Figure 4: Monthly accounts reached by followers and non-followers



Note: Accounts reached are for specific months and are non-cumulative. Data for specific posts is available in Figure 5. Figure 4 shows various levels of engagement even after the lectures and the course have finished. It highlights the popularity of the content among students, particularly from followers, where the engagement is relatively stable.

Figure 5: Specific accounts reached by post



Note: The horizontal axis shows the sequence of content posted which are the posts/reels in a sequential order. On average, each piece of content posted (including unique views if it is a post and unique plays if it is a reel - - video) reaches an average of 441.35 users. Accounts reached for a post or video are cumulative from the time of publication until the day we collected the data; we collected the data one week after posting the content. The peaks correspond to reels/videos, which have been proven to be much more popular. If we include impressions (not unique views) and replays, the average increases to over 800 users per post.

We linked content to case studies and/or articles, which are accessible via the Instagram page, creating a resource not just for students but also for educators. At the same time, we outreached economics to the public. Case Studies 1, 2 and 3 below show how this was done. Furthermore, Instagram allows you to classify content in highlights. For this reason, for

someone who accesses the page, it is easy to quickly identify which posts and reels are linked to case studies or academic articles/papers.

3.1.1 Case Study 1: Contenting in advance to encourage engagement and attendance.

We use the Instagram features to engage the students ahead of the lecture, allowing them to participate in the lecture content or feed-forward examples of what they will learn during the session. Managerial Economics I is a challenging course made up of around 400 students from different disciplines with different levels of skills in terms of statistical background. A teaching method that works well, in this case, is to build the lectures from practice to theory to help students understand and engage better with the content (Hawtrey, 2007; Nepal and Rogerson, 2020).

For this course, there is a lecture on Demand Estimation, which includes regression analysis. Twenty-four hours ahead of the lecture, we published a story on Instagram asking the students to select which variables they thought were more likely to affect students' performance. The story made clear that this question was related to the following day's lecture (Figures 6a and 6b)[21].

[21] 97 students engaged with the questionnaire before the lecture.

Figure 6a: Story 1

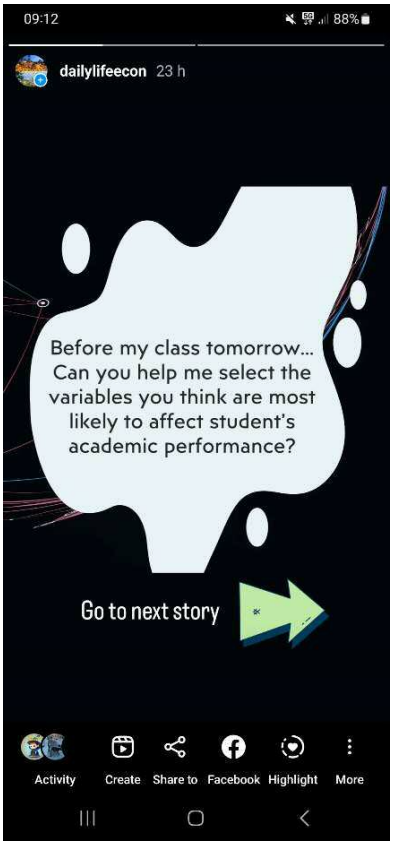
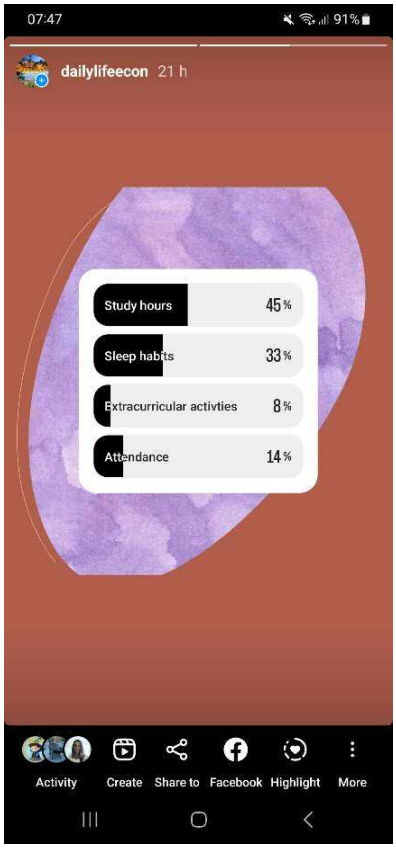
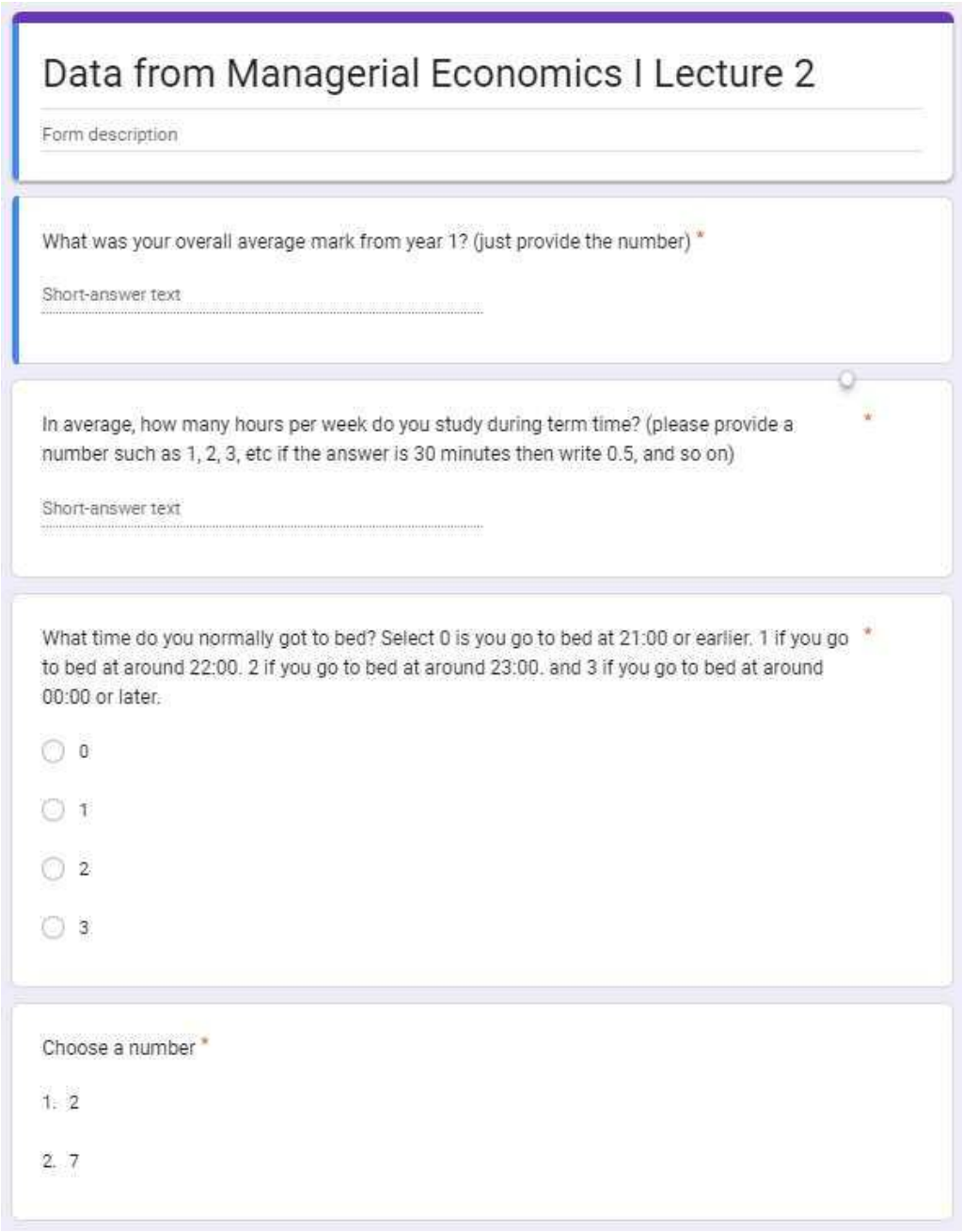


Figure 6b: Story 2



The following day, we started the lecture with the Instagram story results and asked them to fill in an online form questionnaire with questions that elaborated on their findings (Figure 7). The link to the questionnaire and QR code was posted on both the lecture slides and the learning platform.

Figure 7: Questionnaire for regression results



Note: 190 students filled in the questionnaire

With the results immediately available, in class we downloaded the results in Excel format and ran a regression. The results were then used to explain the econometric theory and methodology. In this way, we didn't just use the social network to attract student's attention to the lecture content that week; but it facilitated the active participation of students co -creating aspects of the lecture content.

3.1.2 Case Study 2: Content Linked to Case Studies

The Edgeworth box is a concept studied in intermediate microeconomics to explain the trade of two finite resources between two distinct economies or individuals. However, it isn't easy to find real-world examples that simplify this concept. The concept of the Edgeworth box was taught in Microeconomics 4.

We created a reel which depicted the situation of two campers in a campsite as a quasi-natural experiment to explain the concept of the Edgeworth box. In the reel/video (Figure 8), there are two campers: the Spanish Camper and the English Camper preparing lunch. The Spanish Camper is preparing patatas bravas, and the English camper is preparing Cumberland sausages. However, a perfect lunch for both campers would be better off with a combination of both dishes. The video then shows how the campers trade moving within the box.

Figure 8: A screenshot of the “Edgeworth box: a culinary experience” video, in which the two campers trade Cumberland sausages and patatas bravas.

Below the reel, there is a caption that gives context to the reel and prompts viewers to take further actions, such as accessing the case study, if they are interested in learning more (Caption 1).

Caption 1: Caption to the “Edgeworth Box: A Culinary Experience” video

> *“Did you know that the Edgeworth Box is a powerful tool used to showcase how the exchange between two individuals can boost one person's well-being without hurting the other? This leads to a win-win situation, enhancing overall social welfare from a given set of resources!*
>
> *It's all about that Pareto improvement – making everyone better off without making anyone worse off!*
>
> *During our summer break at a campsite in Spain, we can illustrate the basics of the Edgeworth Box, shedding light on the fascinating world of general equilibrium theory!*
>
> *Let's dive into the world of economics while soaking up the sun and learning something new! Are you ready to unravel the mysteries of the Edgeworth Box with us?*
>
> *For economists or those curious minds who would like to know more, you can access a complete case study in the case studies bank (link available in bio).”*

After engaging the students with the reel and relating the concept to a daily life situation, a case study can be accessed to give further details. In this sense, the reel is used as both as a means to relate to concepts to the real world, but also as a starting point to understand complex concepts in more depth. Using the campers' example, more specific economic concepts were addressed and further details on how each moment of the reel relates to economics theory were elaborated on. A bank of case studies is available via the Instagram page bio, which include questions and suggested answers, making them helpful educational resources[22].

3.1.3 Case Study 3: Content linked to academic papers or articles.

The concept of interest rates and how they affect decision-making in the economy is taught in different macroeconomics courses at different levels. This was taught in a final year undergraduate level for the course Monetary Macroeconomics.

It can be difficult for students to engage with research if they don’t see the application or they don’t understand the relevant concept. Following an article in *The Conversation* published by Tayler (2023) about how the Bank of England’s interest rate increases affect different people from different economic backgrounds, we created a reel where a young renter, a mortgage

[22] Access the case study for the “Edgeworth Box: A Culinary Experience” here: https://drive.google.com/file/d/1oSvkW5TB61vCL40gNUymsIiHx7tItjtT/view. The rest of the case studies related to the Instagram Account can be accessed through here: https://sites.google.com/view/dailylifeecon/case-studies

holder, and a pensioner with investments briefly explain, while having a drink in a bar, how the policies of the Bank of England are affecting them (Figure 9).

Figure 9: A screenshot of "A Young Renter, a Mortgage Holder, and a Homeowner with Investments enter into a Bar"

In this case, the caption will give context but also send the students to the relevant article, which will give them more information about how the policy affects each group and the methodologies used to research each case (Caption 2).

Caption 2: Caption to the A Young Renter, a Mortgage Holder, and a Homeowner with Investments Enter into a Bar" video.

> *"A young renter living paycheck to paycheck, a father with a new mortgage, and an outright homeowner with investments enter a bar. Do you want to know how the increase in interest rates is affecting them?*
>
> *A reel based on "How the Bank of England's interest rate hikes are filtering through your finances" by William Tayler (Lecturer at Lancaster University) at The Conversation*
>
> *On September 22nd, the Bank of England will decide whether to increase interest rates again…but that's a conversation (or a reel) for another day.*

Although the reel was based on an article published in a specialized magazine, we have similar examples of posts and reels based on academic articles[23].

3.2 Students' Performance: Methodology, Results, and Feedback

As explained in Section 2, some students reported interacting with the account at different stages during the courses, although they were not followers. Like followers of the account, non-followers are able to actively interact with the content in the form of likes and/or comments. We use an OLS regression to analyse the effect that either being a follower or interacting with the account has on the student's percentile rank in the course. Specifically, we estimate the following equation:

$$_{ijt} = \alpha_0 + \beta_1 \ _i + \beta_2 \ _{ij} + \beta_3\delta_j \ + + \beta_4 \quad + \quad _{ijt} \quad (2)$$

where the suffix *i* represents the student and *j* represents the subject (Managerial Economics I; Microeconomics 4; Principles of Microeconomics 2; or Monetary Macroeconomics).

$_{ijt}$ is the dependent variable and represents the percentile rank of student *i* in course *j*, in academic year *t*. The percentile rank was calculated as the student's ranking in terms of their final mark in the course compared to the total number of students for that course. The percentile rank goes from 0 to 1, with a lower percentile rank indicating that a student has performed better than a larger proportion of their peers.

$_i$ is a dummy variable which equals 1 if student *i* is a follower of the account and 0 otherwise.

$_{ij}$ accounts for the number of interactions which includes active engagement with the account of student *i* for subject *j*. This includes comments or likes.

δ_j is a set of dummy variables at subject level and $_t$ is a set of dummy variables at academic year level.

We then study whether being a follower or actively engaging with the account affects the probability of failing or getting a mark above average[24]. Using a probit model, we estimate the following equations:

[23] https://sites.google.com/view/dailylifeecon/academic-articles-or-specialised-magazines

[24] The average final mark for each course was calculated. Marks are given over 100. The average mark for Managerial Economics I academic year 22/23 was 65.96, and for the academic year 23/24 was 69.94. The average mark for Microeconomics 4 academic year 22/23 was 58.22, and for the

$$_{ijt} = \alpha_0 + \beta_1 \ _i + \beta_2 \ _{ij} + \beta_3\delta_j + + \beta_4 \quad + \ _{ijt} \quad (3)$$

$$_{ijt} = \alpha_0 + \beta_1 \ _i + \beta_2 \ _{ij} + \beta_3\delta_j + \beta_4 \quad + \ _{ijt} \quad (4)$$

Where $_{ijt}$ and $_{ijt}$ are categorical variables which take values of 0 or 1. $_{ijt}$ equals 1 if student *i* had a final mark below 40 in subject *j* and academic year *t*, 0 otherwise. $_{ijt}$ equals 1 if student *i* had a final mark above average in subject *j* and academic year *t*, 0 otherwise.

As a robustness test to control for the past performance of the students, we introduce the percentile rank in previous related courses that students have taken. For Microeconomics 4 and Principles of Microeconomics 2, we calculated the average of past Microeconomics courses, which were pre-requisite. For Monetary Macroeconomics, we collected data on the marks in the previous macroeconomics course, which was a pre-requisite. Finally, Managerial Economics I is more of an interdisciplinary course with no clear pre-requisites or pathways, so we collected the average mark in the full previous year. We then calculated the percentile rank of student *i* compared with the rest of the students.

Table 2 shows the results for equations 2, 3, and 4. Column 1 presents the results for equation 2, columns 3 and 4 for equation 3, and columns 5 and 6 for equation 4. Columns 2, 4, and 6 include the control for the percentile rank of student *i* in past related courses.

We observe that being a follower has a statistically significant negative effect on the percentile rank, indicating that students who are followers tend to have lower percentile ranks, thus performing better compared to their peers. When we introduce past performance of the students in column 2, the coefficient is lower but still statistically significant, indicating that past performance accounts for some of the effect but does not fully explain the relationship between being a follower and better performance.

In columns 4 and 6, we observe that students who follow the account are less likely to fail the course and more likely to achieve a mark above average. This effect remains statistically significant even when past performance is controlled for. The number of interactions is statistically significant in columns 3 and 4, indicating that increased student interaction is associated with a higher likelihood of passing the course, independent of being a follower. Significantly, whilst followers receive updates on our activity and are more likely to be

academic year 23/24 was 60.68. The average mark for Monetary Macroeconomics academic year 22/23 was 58.55, and for the academic year 23/24 was 63.30. The average mark for Principles of Microeconomics 2 academic year 22/23 was 59.6, and for the academic year 23/24 was 65.64.

consistently exposed to the content, the algorithm of Instagram will also expose content to non-followers of the account, especially when they are regularly watching reels/ posts.

Appendix 1, Table 1.1 shows the results when the final mark is considered as the dependent variable in columns 1 and 2, and the average final marks of related subjects are used as a control in columns 2, 4, and 6.

Table 2: OLS and Probit regression results

VARIABLES	(1) Percentile Rank	(2) Percentile Rank	(3) Grade below 40	(4) Grade below 40	(5) Grade above average	(6) Grade above average
Follower	-0.122***	-0.0934***	-0.0293***	-0.0139*	0.164***	0.131***
	(0.0179)	(0.0188)	(0.00676)	(0.00751)	(0.0288)	(0.0320)
Number of interactions	-0.00202	-0.00450	-0.00405***	-0.00544***	0.00859	0.00554
	(0.00726)	(0.00940)	(0.00124)	(0.00184)	(0.0108)	(0.0144)
Past Percentile Rank		0.428***		0.131***		-0.586***
		(0.0243)		(0.0215)		(0.0420)
Constant	0.523***	0.294***	0.0488***	-0.0138	0.631***	0.952***
	(0.0183)	(0.0216)	(0.0144)	(0.0135)	(0.0301)	(0.0353)
Subject fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Robust s.e.	YES	YES	YES	YES	YES	YES
Observations	1,736	1,383	1,736	1,383	1,736	1,383
R-squared	0.028	0.210	0.016	0.064	0.027	0.144

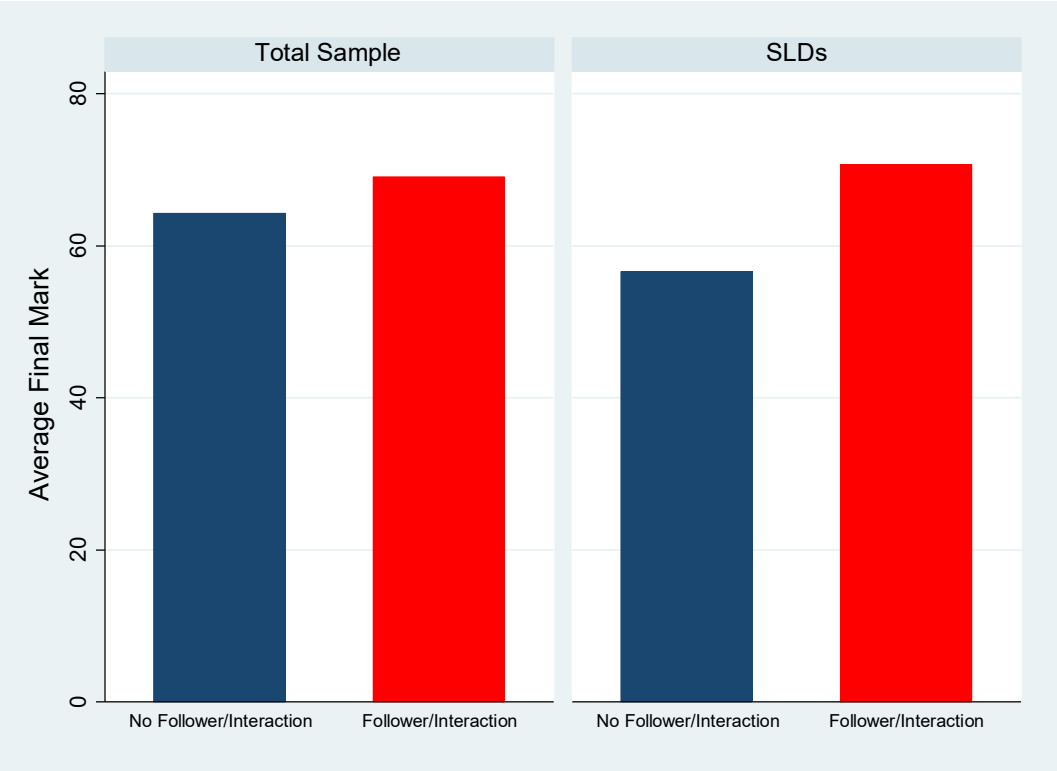
Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. The dependent variable in Columns 1 and 2 is the percentile rank of student *i* in course *j*. The dependent variable in columns 3 and 4 is a categorical variable, which takes value 1 if the final mark of a student is less than 40, and 0 otherwise. The dependent variable in columns 5 and 6 is a categorical variable, which takes value 1 if the final mark of a student is above the average mark in the subject and 0 otherwise. Columns 2, 4, and 6 include the control of students past performance in related courses.

The results presented in columns 1, 3, and 5 show a positive relationship between engaging with the Instagram account and the percentile rank of students in the course. This is consistent with the research by Manan et al., (2012) and Veletsianos and Navarrete, (2012), who also find a positive correlation between social media engagement and academic performance. When we control for past performance in the courses (columns 2, 4, and 6), the results remain statistically significant, which suggests that the observed effects are not solely due to inherent differences in student engagement or keenness but that engagement with the Instagram account may also contribute independently to better academic outcomes[25]. Whilst factors such as socioeconomic status, access to resources, and prior educational experiences could also play a role, we would have expected these factors to also affect past performance (Junco et al., 2010).

[25] Nevertheless, we still have to consider that there may be other effects, such as students' backgrounds, which might influence both their likelihood to engage with the Instagram account and their academic performance.

The University categorises some of our students as students with specific learning difficulties and/or disabilities (SLDs). These students are given extra support for coursework and exams, commonly in the form of extra time for completion. Around 6% of the students in our dataset are categorised as SLDs students. Students in this category are more likely to prefer alternative teaching methods or extra help to support traditional teaching (Brady, 2010, and McCarthy, 2009). Figure 8 shows that students who follow and/or interact have, on average, higher final marks than those students who don't follow or interact with the account. Moreover, we can observe that this difference is significantly higher for SLDs who follow and/or interact with the account.

Figure 8: Average Final Mark No followers vs Followers for Total Sample and SLDs



Focusing on the SLDs subsample we analyse the effect that either being a follower or interacting with the account have on the percentile rank for SLDs students. Since we can observe which SLDs students were following us or interacting with the account; we can consider them as a treatment group. Specifically, and following equation (2), we estimate the following model:

$$_{ijt} = \alpha_0 + \beta_1 \ _i + \beta_2 \ _{ij} + \beta_3 S \ _{ij} + \beta_4 (S \ * \ )_{ij} + \beta_5 (S \ * \ )_{ij} + \beta_3 \delta_j + \beta_4 \ _t + \ _{ijt} \quad (5)$$

$S \ _{ij}$ is a dummy variable which equals 1 if student *i* in subject *j* has been categorised as a SLD student in academic year *t*, and 0 otherwise.

$(S \ * \ )_{ij}$ represents the interaction between $S \ _{ij}$ and $\ _i$. This variable will be 1 if student *i* in subject *j* has been categorised as a SLD student and follows the account, and 0 otherwise.

$(S \ * \ )_{ij}$ represents the interaction between $S \ _{ij}$ and $\ _{ij}$. This variable will equal the number of interactions of student *i* in subject *j* if the student has been categorised as a SLDs student, and 0 otherwise.

Table 3 shows the results for Equation 5. We can see that SLDs students are lower in the percentile distribution compared to the rest of the students in the subject. However, the interaction of the variables SLDs and Follower has a significant positive effect on SLDs students' percentile rank, indicating that being exposed to the account and the extra resources provided is positively correlated with a higher final mark for those SLDs students who follow the account. These results remained significant even when we controlled for students' past performance.

Similarly, SLDs students are more likely to fail the course or receive a grade below average, as observed in columns 1 and 2. In this case, the interaction term between SLDs and Follower is also statistically significant, meaning that following the account increases the likelihood of passing the course and achieving a mark above average. When we introduce the past performance of the students, the results remained significant, except for column 6, where past performance explains the effects of being an SLDs and following the account. However, it still doesn't explain the positive effect of being a follower for the full sample.

Unlike the results in Table 2, the number of interactions per subject does not have a significant effect on SLDs students. This could be because they are more passive followers of the Instagram account but may still benefit from the additional resources provided. Appendix 1, Table 1.2 shows the results when the final mark is considered

as the dependent variable in columns 1 and 2, with the average final marks of related subjects used as a control in columns 2, 4, and 6.

Table 3: OLS and probit regression results – SLDs students

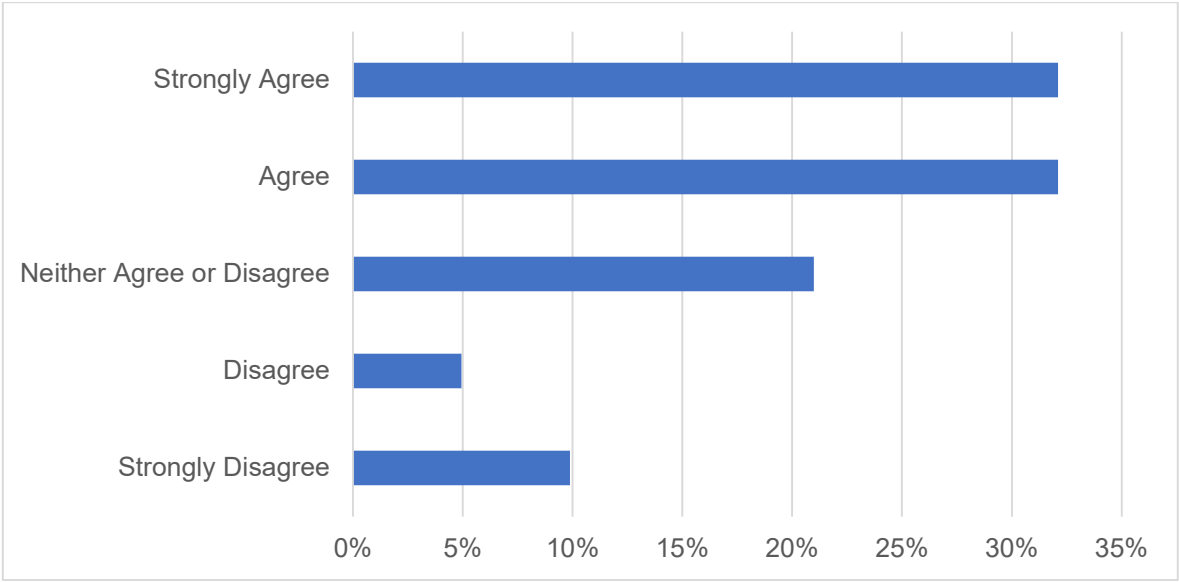
VARIABLES	(1) Percentile Rank	(2) Percentile Rank	(3) Grade below 40	(4) Grade below 40	(5) Grade above average	(6) Grade above average
Follower	-0.116***	-0.0893***	-0.0273***	-0.0123*	0.153***	0.121***
	(0.0186)	(0.0191)	(0.00597)	(0.00647)	(0.0302)	(0.0332)
Number of interactions	-0.00338	-0.00823	-0.00288***	-0.00384**	0.00995	0.00883
	(0.00736)	(0.00945)	(0.000939)	(0.00150)	(0.0108)	(0.0146)
SLDs	0.127***	0.0530	0.0977**	0.0943**	-0.204***	-0.0907
	(0.0365)	(0.0346)	(0.0402)	(0.0474)	(0.0573)	(0.0608)
SLD*Follower	-0.148*	-0.157*	-0.0888**	-0.106**	0.194*	0.223
	(0.0758)	(0.0946)	(0.0382)	(0.0442)	(0.116)	(0.144)
SLD*Interactions	-0.00124	0.0801	-0.00813	-0.00224	-0.00101	-0.103
	(0.0407)	(0.0561)	(0.00701)	(0.0114)	(0.0581)	(0.0864)
Past Percentile Rank		0.419***		0.125***		-0.567***
		(0.0252)		(0.0208)		(0.0437)
Constant	0.521***	0.303***	0.0557**	-0.0200	0.494***	0.794***
	(0.0317)	(0.0290)	(0.0256)	(0.0237)	(0.0554)	(0.0543)
Subject fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Robust s.e.	YES	YES	YES	YES	YES	YES
Observations	1,684	1,333	1,684	1,333	1,684	1,333
R-squared	0.038	0.209	0.028	0.077	0.034	0.139

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. The dependent variable is the final mark of student *i* in subject *j*. The dependent variable in columns 3 and 4 is a categorical variable, which takes value 1 if the final mark of a student is less than 40, and 0 otherwise. The dependent variable in columns 5 and 6 is a categorical variable, which takes value 1 if the final mark of a student is above the average mark in the subject and 0 otherwise. Columns 2, 4, and 6 include the control of students' past performance in related courses.

Using post-exposure questionnaires after the courses finished, we collected feedback on the impact that the Instagram account had on the student's learning journey[26]. Most of the students found the account helpful in explaining economic concepts related to their course (Figure 9), and it helped them to relate the theoretical economic concepts to real-world situations (Figure 10).

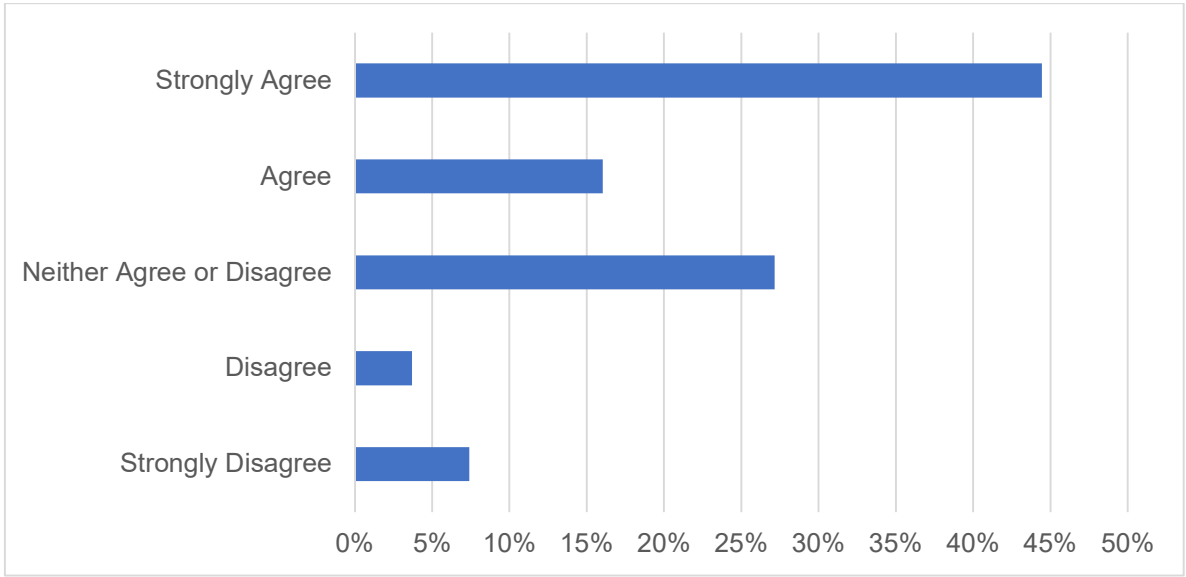
[26] 81 students answered the post-exposure questionnaire between the University of Manchester and Lancaster university.

Figure 9: “I found the content in the Instagram account helpful in explaining economic concepts”



Note: students were asked to indicate how much they agree with the following statements regarding the impact of following our Instagram account and their understanding of economics. 64% found that the content in the Instagram account helped them to understand economic concepts

Figure 10: “The account helped relate economic concepts to real-world situations”.



Note: students were asked to indicate how much they agree with the following statements regarding the impact of following our Instagram account and their understanding of economics. 60% found that account helped them to relate economic concepts to real-world situations.

Students also had the option to add additional comments, and we received unofficial feedback via email or other forms of contact. Table 4 summarises the most comments written by the students about the account.

Table 4: Students' feedback about how the Instagram account helped them or their general opinion.

Opinion	Percentage of students
Creative or refreshing	77%
Making concepts relevant to real-life	69%
Approachability or engagement	69%
Understanding complex concepts	62%
I will share the content with friends	54%
Good opportunity for feedback	46%

In general, students find the inclusion of the Instagram account relevant to their daily lives and a creative or refreshing way of approaching economics content. They also find that it can help them understand complex concepts with a smaller percentage mentioning that it was an excellent opportunity to feed-forward the content to be taught in class.

Students who followed the account and were exposed to the content on a regular basis had higher percentile ranks compared to their peers, implying a potentially beneficial influence on their academic achievements. Student feedback consistently emphasised the Instagram account's ability to enhance their understanding of complex concepts, connect economics to real-life scenarios, and create a more engaging and accessible learning environment. This underscores the relevance of social networks as a tool to promote research-led activities and increase student engagement.

4. Conclusions

The transformative impact of the COVID-19 pandemic on higher education prompted a revaluation of traditional teaching methods, particularly within the context of economics education. Survey results reveal that a significant portion of students now prefer a blended approach that integrates both face-to-face and digital learning. The pandemic has highlighted the need for innovation in the educational system to align with the digital preferences of the younger generation.

This paper explored the integration of social networks, specifically Instagram, as a tool to introduce research-led teaching activities, enhance student engagement, and connect

academic concepts with real-world scenarios. Although the integration of research into teaching practices has long been an aspiration for universities, achieving the optimal balance between research and teaching is an ongoing challenge. This study addressed this challenge by leveraging Instagram to bridge the gap between academic research and student engagement.

The results of our study reveal noteworthy findings. Instagram's dynamic features, including posts, reels, and stories, successfully engaged students with economics concepts by making them relatable to their daily lives. Introducing concepts through real-world scenarios and utilising Instagram's multimedia capabilities allowed for innovative, research-based teaching practices. Additionally, integrating academic articles and case studies into the platform's content enhanced its relevance and utility.

Our study demonstrated that engagement with the Instagram account has a positive effect on students' percentile ranks, suggesting a positive impact on learning outcomes. Importantly, we controlled for students' past performance, which confirmed that the observed effect was not solely due to prior academic achievements. The results are particularly relevant for SLDs students, who on average perform worse than their peers. For these students, engaging with the Instagram account not only closed this performance gap but also enhanced their percentile ranks, indicating that the account provided additional support and resources that contributed positively to their academic success.

Student feedback consistently highlighted the Instagram account's effectiveness in enhancing their understanding of complex concepts, relating economics to real-life situations, and creating a more engaging and approachable learning experience.

The implementation of social networks in academia, as exemplified by our Instagram initiative, offers a promising path forward for enhancing teaching practices and fostering meaningful connections between students, educators, and subject matter. As the educational landscape continues to evolve, embracing innovative approaches like social media integration can address the challenges posed by the changing preferences and expectations of student cohorts. While the integration of research into teaching remains complex, harnessing the power of platforms like Instagram can bridge the gap and create a more enriching and accessible educational experience for students. Furthermore, our findings indicate that the content also attracted the non-student population, providing them with a fresh perspective on economics and highlighting the platform's potential to engage broader communities.

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Appendix 1

Table 1.1: OLS and Probit results. Final mark

VARIABLES	(1) Final mark	(2) Final mark	(3) Grade below 40	(4) Grade below 40	(5) Grade above average	(6) Grade above average
Follower	4.516***	3.101***	-0.0293***	-0.0122	0.164***	0.139***
	(0.604)	(0.647)	(0.00676)	(0.00787)	(0.0288)	(0.0323)
Number of interactions	0.191	0.354	-0.00405***	-0.00554**	0.00859	0.00507
	(0.259)	(0.349)	(0.00124)	(0.00235)	(0.0108)	(0.0146)
Average past final mark		0.465***		-0.00414***		0.0130***
		(0.0354)		(0.000706)		(0.00104)
Constant	64.37***	34.23***	0.0488***	0.302***	0.631***	-0.129*
	(0.847)	(2.340)	(0.0144)	(0.0506)	(0.0301)	(0.0689)
Subject fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Robust s.e.	YES	YES	YES	YES	YES	YES
Observations	1,735	1,382	1,736	1,383	1,736	1,383
R-squared	0.131	0.349	0.016	0.098	0.027	0.132

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. The dependent variable in Column 1 and 2 is the final mark of student *i* in subject *j*. The higher the final mark, the better the students' performance in that subject. The dependent variable in Columns 1 and 2 is the percentile rank of student *i* in course *j*. The dependent variable in columns 3 and 4 is a categorical variable, which takes value 1 if the final mark of a student is less than 40, and 0 otherwise. The dependent variable in columns 5 and 6 is a categorical variable, which takes value 1 if the final mark of a student is above the average mark in the subject and 0 otherwise. Columns 2, 4, and 6 include the control of average students' past performance in related courses. We can observe that the results are very similar to those reported in Table 2 in terms of statistical significance and the importance of being a follower on overall performance. A difference from Table 2 is that column 4 shows that being a follower is not statistically significant when we include the average past performance of students. However, the number of interactions remains statistically significant in this case, increasing the likelihood of passing the course.

Table 1.2: OLS and Probit results. Final mark. SLDs students

VARIABLES	(1) Final mark	(2) Final mark	(3) Grade below 40	(4) Grade below 40	(5) Grade above average	(6) Grade above average
Follower	4.214***	2.938***	-0.0273***	-0.0108	0.153***	0.131***
	(0.612)	(0.630)	(0.00597)	(0.00687)	(0.0302)	(0.0336)
Number of interactions	0.240	0.416	-0.00288***	-0.00354*	0.00995	0.00696
	(0.258)	(0.355)	(0.000939)	(0.00210)	(0.0108)	(0.0151)
SLDs	-6.509***	-3.808*	0.0977**	0.0900*	-0.204***	-0.104*
	(2.006)	(2.081)	(0.0402)	(0.0462)	(0.0573)	(0.0615)
SLD*Follower	6.624**	6.344*	-0.0888**	-0.100**	0.194*	0.199
	(2.850)	(3.584)	(0.0382)	(0.0430)	(0.116)	(0.140)
SLD*Interactions	0.0306	-2.212	-0.00813	-0.00175	-0.00101	-0.0830
	(1.220)	(1.820)	(0.00701)	(0.0109)	(0.0581)	(0.0846)
Average past final mark		0.454***		-0.00412***		0.0126***
		(0.0370)		(0.000707)		(0.00109)
Constant	64.72***	37.67***	0.0557**	0.287***	0.494***	-0.240***
	(0.837)	(2.564)	(0.0256)	(0.0521)	(0.0554)	(0.0829)
Subject fixed effects	YES	YES	YES	YES	YES	YES
Year fixed effects	YES	YES	YES	YES	YES	YES
Robust s.e.	YES	YES	YES	YES	YES	YES
Observations	1,683	1,332	1,684	1,333	1,684	1,333
R-squared	0.141	0.347	0.028	0.114	0.034	0.127

Note: Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. The dependent variable in Column 1 and 2

is the final mark of student *i* in subject *j*. The higher the final mark, the better the students' performance in that subject. The dependent variable in Columns 1 and 2 is the percentile rank of student *i* in course *j*. The dependent variable in columns 3 and 4 is a categorical variable, which takes value 1 if the final mark of a student is less than 40, and 0 otherwise. The dependent variable in columns 5 and 6 is a categorical variable, which takes value 1 if the final mark of a student is above the average mark in the subject and 0 otherwise. Columns 2, 4, and 6 include the control of average students' past performance in related courses. We can observe that the results are very similar to those reported in Table 3 in terms of statistical significance and the importance of being a follower on overall performance for SLDs students.