To what extent can flipped learning strategies enhance the success of SRL in A-level economics

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To what extent can flipped learning strategies enhance the success of SRL in A-level economics?

Abstract

This research looks to support the deeper learning of A-level economists through assessing the merits of flipped learning to improve the use, and success, of self-regulated learning (SRL). With a focus on autonomy, self-efficacy and self-assessment cycles, successes were expected not only through improved academic results but also by enhancing students' wider transferable skills for use beyond 6th form education.

The research was conducted with a lower 6th form cohort of A-level economists over an initial two week intervention period. A second phase was scheduled, but the COVID-19 pandemic halted these plans due to the nationwide closure of schools in March 2020. The research not only sought to uncover whether students' learning outcomes would improve, but also to study the behaviours and motivations which influenced their success.

The research revealed that most students used SRL successfully and experienced improved learning outcomes, however, there was a noticeable decline in usage of one element of the SRL framework as the intervention progressed. The data showed that motivational influences played a significant role in reducing the effective use of self-assessment tools, resulting in diminishing learning outcomes. This impacted all students in the sample, including those displaying mastery behaviours.

It is suggested that a full adoption of flipped learning is not advisable given the cognitive load and implicit need for independent decision making, resulting in declining use of SRL. However, a short term adoption of flipped learning within a blended approach to education should enhance both learning outcomes and wider problem-solving skills.

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Introduction

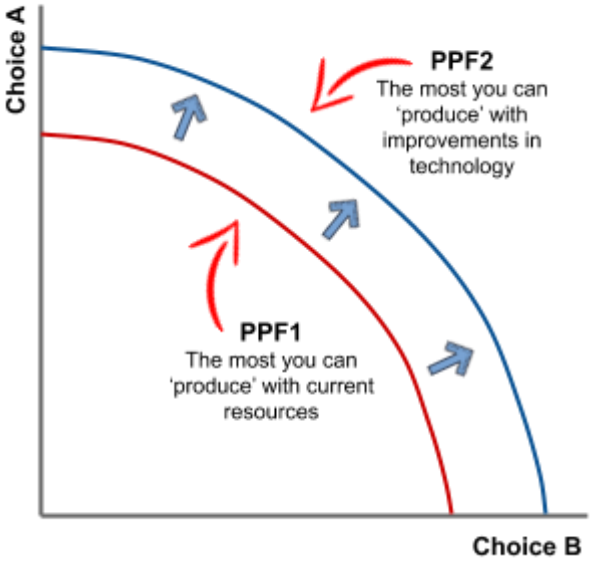
Technology has changed our world at an unprecedented pace, bringing both opportunities and problems. Within education, the rapid evolution of technology has brought about many beneficial changes, not least in its ability to break down barriers of communication and facilitate access to limitless information resources. However, parents and educators are also fearful of the addictive attraction to scrolling infinitely through social media websites such as Instagram, Facebook and Twitter, and hours of video content on Youtube and TikTok (Mancall-Bitel, 2019; Rice & Wye, 2020). Students are no longer distracted from their school work by their friends looking to play a game of football after school, rather, they now have 24/7 instant access to a global network of friends, acquaintances and 'influencers' (BBC, 2019). This poses a problem for education as students have never before been required to prioritise work above such a range of options at their fingertips, and thus self-regulate against so many competing desires to pursue their own learning.

In economics, two of the first concepts studied are that of the 'basic economic problem' and 'opportunity cost.' The 'basic economic problem' states that when resources such as time are scarce, people must make choices between competing objectives. Therefore, in making any choice, there is an opportunity cost of the next best option which cannot be achieved. The benefits of the rejected option are lost. Similarly, access to technology in the palm of students' hands poses limitless choices resulting in a constant need to make such decisions, and deal with the subsequent costs. Evidence suggests a self-regulated learner should be able to manage these choices more effectively in comparison to those responding primarily to external regulation (Rutherford *et al*., 2018). The theory also applies to teachers who must consider their pedagogical choices with the recognition that in choosing one teaching approach, others cannot be used. Therefore it is vital to understand which strategies have the biggest impact for the best choices to be made. As Sanders and Horn (1998) aptly note, the actions of a good teacher will have long lasting impacts on a student's life, much like the negative impacts of a bad teacher. This study

details the consequences of one of these 'decisions' by analysing the effectiveness of a self-regulated learning (SRL) framework, through the use of flipped learning.

Economists proceed to learn that the concept of opportunity cost can be illustrated with the help of a Production Possibility Frontier (PPF) (Figure 1). When we use all of our resources efficiently we produce at any point on the PPF line, our maximum potential output, as opposed to inefficient production inside of it. However, with technological advances, the productive possibility increases, or more simply, we are able to achieve a greater output with the same inputs. Perhaps, then, to extend the theory to education, the rapid expansion of technology might act as a catalyst to enhance educational success, for example; through facilitating improved presentation of ideas, better feedback opportunities and more fluid communication. Technology might aid the teaching process without requiring additional time or resources from the teacher or student in the long term. An example of this is flipped learning, which has received increased interest in light of the accelerated evolution of technology (Woolf, 2010). Flipped learning can be simply understood as inverting the traditional classroom and homework model so that knowledge acquisition is completed independently out of class by students. This frees up class time to be used for deeper, productive, knowledge-guided activities supported by the teacher (He *et al*, 2016). Whilst Farrell and Danby (2015) note that flipped learning is nothing new, the development of technology has made it much more accessible through popular video learning websites such as Khan Academy, TED-Ed and YouTube (Roach, 2014). An assessment of flipped learning as a teaching strategy will help to understand whether the impacts are positive and significant enough to prompt a change in the delivery of education.

Figure 1 - The Production Possibility Frontier



I work in a selective independent boarding and day school in Cambridgeshire. Economics is taught at 6th form and is one of the most popular subject choices with a cohort of approximately 70 students. Those who typically study Economics are usually proficient in learning the new concepts and theories behind the subject but too often this formative knowledge is insufficient to construct thoughtful, analytical and considered arguments that correctly position theories into a real world context. Personal observations reveal that students typically rely on formulaic writing styles and reciting theoretical knowledge which falls short of demonstrating creativity or thoughtful analysis, missing the top end of assessment grades. Numerous discussions in department meetings, and with other subject teachers in the school's Teaching and Learning Group, support these assertions. In addition, when speaking with teachers across the country, both in person and online, most agree that this is also an area of difficulty for their students. Therefore, although my school setting is atypical, being seen at the 'elite' end of the education provision in the UK, the problems experienced appear to be typical across a range of schools. Research is thus relevant and useful to all economics teachers, and potentially other subject teachers.

My aim was to understand whether self-regulated learning (SRL) through flipped learning strategies would help to support a deeper and broader understanding of subject material, fostering a greater ability to critically examine more challenging problems. The intention was that flipped learning could then be implemented in teaching to develop successful learning in both the short and long term.

A literature review on the topic of SRL and flipped learning focused on four questions:

1. What constitutes success in A-level economics?
2. What is Self-Regulated Learning (SRL) and why is it desirable?
3. How does flipped learning support SRL?
4. What role does motivation play?

Literature Review

1 Success

Within the field of education, success can be a contentious term, often holding different meanings for different people, and thus it seems logical to seek clarity before continuing. For my A-level economists, success would often be understood as top marks in an essay assignment or an A* in their final exams. Some might position success as simply being better than their close friends or family who act as a yardstick for their learning. Others might judge success against their predetermined goals and aims. Success is thus comparative. From a teaching perspective, whilst there must be a recognition of the importance of exam success as it opens up doors to a wider variety of future paths, there are also broader understandings of success which are just as valid. These include intangible competencies or behaviours, such as being a 'nice guy' or a supportive and listening friend, or more focused towards learning practice. Within the context of this study, the focus was on the direct learning capabilities and outcomes of becoming critical thinkers, problem solvers and team players (O'Flaherty and Phillips, 2015). Within the classroom this might be seen through paying attention, planning ahead, and organising behaviour appropriately (Rutherford *et al*., 2018), but these behaviours and attitudes are likely to have longer term and more transferable relevance. Thus, success in this context can be understood as long term learning through engagement (Barkley, 2010) rather than short term achievement through outcome. I believe that, as O'Flaherty and Phillips (2015) also argue, we need students to leave school with the ability to reflect, question, conjecture, evaluate and make connections between ideas. I am reminded of an interview question for a top level graduate scheme to filter and assess the skills of the best applicants which asked "how much cash is there in all of the cash machines in the UK?" Whilst applicants were obviously not expected to know the answer, they were expected to deconstruct the problem into its logical components and come to a reasonable conclusion based on very little knowledge. The question highlights the attributes most prized by

employers; how someone deals with unfamiliar circumstances and draws on reasoning to reflect and evaluate problems, without panicking or falling into a state of confusion. Arguably a student who has not previously had to think this way is unlikely to be able to reasonably give such an answer as it relies on a broader and more intangible set of skills (Snow, 1989).

1.1 Deep and surface learning

Snow (1989) argued that the desired end goal of learning is that a learner is equipped to display articulated, deep understanding of a domain, possess the ability to reason and explain aspects of that domain in causal terms, and to adopt multiple viewpoints about a phenomenon. Within the narrow context of economics, this goal is just as relevant to the broader context of life-long learning, and thus seems like a fitting understanding of 'success'. Marton and Säljö (1976) divided learning into two categories: deep and surface, or superficial learning. Deep learners are understood to be agents of their own learning; formulating plans, setting goals, questioning the principles behind a text or theory and using the logic of argument in pursuit of detailed comprehension (Entwistle, 2000; Evans *et al*., 2003; Vandevelde *et al*., 2017; Rutherford *et al*., 2018). Surface learners, conversely, are focused on reproductive conception, accumulation of knowledge and the memorisation and repetition of information to meet procedural requirements (Marton and Säljö, 1976; Smith *et al*., 2005b; Laird *et al*., 2008; Phan, 2009; Reason *et al*., 2010). Cacioppo *et al.* (1996) made a similar point but formed the division between 'cognisers', who seek, acquire and think about information, and 'cognitive misers', who rely on others and social comparison to find meaning. When comparing Snow's desired end goal of learning with Marton and Säljö's types of learning, it appears that deep learning is more aligned with good learning for both economics and longer term transferable skills. However, I question the simplicity of this neat division. Within economics, there are areas of the course where a surface learning model would suffice, for example with certain formulas or definitions. This type of knowledge is essential but only in these specific circumstances as there are limited connections required and few criticisms of the process. In the right context, therefore, this

atomistic learning would be perfectly reasonable and effective. Thus the choice of deep or surface learning should depend on the task (Reason *et al*., 2010). This is echoed by Rozendaal *et al.* (2001), who suggest that surface and deep learning should not be perceived as the ends of the same continuum, but rather can be used alternately. For example, surface learning could function as a precondition for deeper learning or could be implemented as an approach to revision to memorise earlier deep learning (Palmer, 1998). In spite of these questions surrounding whether they should be seen as a strict dichotomy, the theory appears to suggest that deep learning should still be regarded as an end goal in most circumstances, which certainly echoes the prevailing analytical and evaluative skill requirements in A-level Economics.

1.2 Orientations

Whilst a deeper learning approach appears most closely aligned with conceptions of success in A-level economics, it must also be recognised that learning processes are intrinsically linked to student behaviours and achievement goals, which feed into beliefs about their learning. Most research highlights two notable achievement goals, that of mastery and performance (Nicholls, 1984; Dweck and Leggett, 1988). Both goals concern the pursuit of competence and assessment of personal skill levels, but they do so in different ways. A performance-oriented student would look to compete with, and outperform, their peers based on comparative reviews, whereas a mastery-oriented student would strive to develop their knowledge and ability, assessed against their own standards (Senko and Miles, 2008). Whilst, on first impressions, mastery might appear to be the most beneficial orientation given the internal pursuit of progress, there are arguments that either can bring encouraging outcomes as mastery could lead to an unfocused approach. For example, a mastery-oriented student might use flawed internal assessment of their skills and knowledge and therefore fall short when externally scrutinised, whereas a performance-oriented student might be more aware of external assessment as they are also comparing themselves to others. There are mixed results in the research as to which is better for learning outcomes (Dweck and Leggett, 1988; Ames,

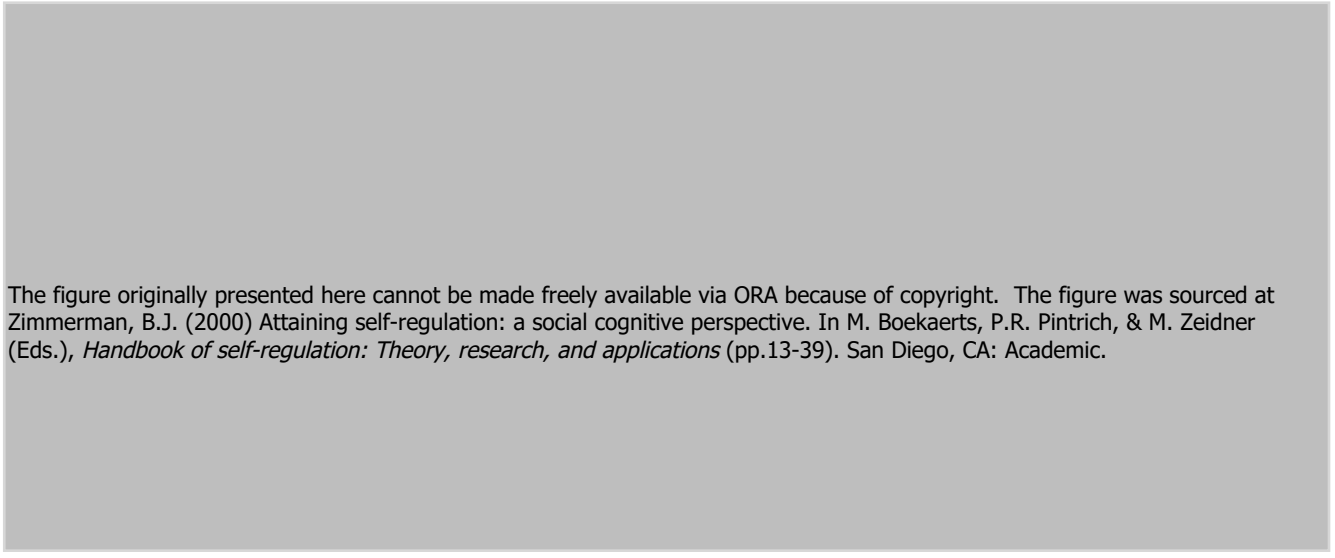
1992; Senko and Miles, 2008); however, there is agreement in that performance-avoidance goals are not conducive to success. Such orientations are linked to anxiety, poor study habits, help-avoidance and self-handicapping (Elliot and Church, 1997; Urdan and Midgley, 2001; Wolters, 2004). Whilst these motivational influences are discussed later in the literature review, it should be recognised that successful outcomes come from both performance and mastery goals, at least in the short term when focusing on exam results. However, an appreciation of the broader success criteria within mastery goals should be noted as mastery can foster innovative behaviour from intellectual curiosity. Success is not just about 'out-competing' others but also about striving for bigger and better outcomes even when there is no competition (Dweck and Leggett, 1988). Perhaps then, success defined through mastery can be more closely associated with becoming experts in narrowly defined fields or reaching the top of their particular specialism, whereas performance goals would be useful in more competitive pursuits.

Overall, whilst success is not precisely defined in the literature, within the context of A-level economics, success will be understood as the pursuit of broader learning to critically assess concepts and theories, create and build connections between ideas and to evaluate importance within the context of a dynamic real world. I argue that success through this definition is focused overwhelmingly on deep learning whilst recognising the need for moments of surface learning. Successful economics students are likely to pursue either performance or mastery goals but the top students, who move beyond the external assessment of exam specifications, are likely to be mastery-oriented. Therefore, the aim to improve success within A-level economics should focus on deep learning strategies and, primarily, encouraging the pursuit of mastery. The combination of these success descriptors should allow students to achieve exam success as well as broader contextual understandings of success.

2 Self-Regulated Learning (SRL)

If success is critically analysing a subject through seeking patterns, purpose and significance, then strategies to meet these aims are needed. Self-regulated learning (SRL) is frequently advocated as a suitable model. Rozendaal *et al.* (2005) suggest that surface learning is primarily linked with external regulation, through external rewards and praise, whereas deep learning is principally aligned with self-regulation. SRL and deeper, successful learning, appear to be fundamentally connected through students creating personal feedback-loops as they reflect on their successes and subsequently pursue improved results. Evans *et al.* (2003) echo this assertion suggesting that SRL is completely incompatible with the majority of surface learning, as students do not revise or expand their learning from an initial position.

Through an active construction of knowledge, self-regulated learners use a range of cognitive, metacognitive and resource management strategies to guide and monitor their learning (Zimmerman, 2000). Often depicted as a self-evaluative cycle (Figure 2), motivational and cognitive processes are routinely scrutinised throughout learning tasks



(Zimmerman, 1990). In practice, three phases are used to simplify the process; the planning phase, the learning phase, and the self assessment phase (Ness and Middleton, 2012; Roscoe *et al.*, 2013). SRL can thus be seen as a compelling strategy for successful

learning by reconstructing an abstract concept into a practical process which students can implement in the classroom.

During the planning phase, students must think metacognitively to analyse the required learning and map out a plan to meet it; they set goals and then seek appropriate background information (Roscoe *et al.*, 2013). Successful learners begin at the foundations of the learning process to calculate what information is required and how best to meet those needs, whereas an unsuccessful learner might skip this phase completely. Consequently, students are presented with the problem solving process prior to actually gaining any 'knowledge'. This skill is important because it replicates the experiences of working life where, although not possessing expertise in every field, employees are encouraged to negotiate the parameters of their knowledge to pursue solutions to an array of problems. Students learn that obstacles can be overcome through utilising the SRL framework and subsequently will maintain effort, regardless of their former achievements or perception of ability (Schunk and Ertmer, 2000; Pajares, 2008).

The learning phase involves attempting to solve the assessed problems through implementing the previously planned tasks. Chi (2009, p74) suggests that outstanding cognitive strategies are "active, constructive, and interactive" as students integrate knowledge, both new and previously held, to build their understanding through reasoning and inference. Students might form ideas from 'gut feelings' or more substantive sources but gradually they will determine how to locate valuable information most appropriately and, importantly, to develop a network of ideas which arranges and prioritises information according to perceived significance. Thus, the learning phase is not primarily focused on knowledge acquisition but also on processing and categorising that knowledge.

Finally, students reach the self-assessment phase. This requires a metacognitive evaluation of students' successes and failures, and subsequently, to use their judgement to revise future targets and strategies (Roscoe *et al*., 2013). Significantly, this means students can gauge the limits of their understanding (Glogger-Frey *et al.*, 2017) and,

consequently, identify areas for improvement. Although self-assessment represents the third and final phase of SRL, the observations feed straight back into the learning process to adapt and improve the previous phases, thereby further enhancing learning. Unfortunately, research suggests that this phase is highly likely to be undervalued and ignored, reducing success, as the cognitive burden builds and motivation slumps (Evans *et al*., 2003). Students might feel like they have 'finished' and therefore undervalue the final self-assessment. Assuming motivation is maintained, however, self-assessment should enable students to build self-efficacy as they play an active role in their own learning through understanding how best to reach goals in a logical manner, resolving bad habits and reducing inefficient working practices.

2.1 Teaching SRL

It is imperative to note that without explicit teacher implementation SRL is unlikely to be utilised, at least to its full extent.

> "Learning is not attained by chance; it must be sought for with ardor and attended to with diligence"
>
> Abigail Adams (in Howe, 2003, p4)

SRL is often seen as a cognitively arduous approach to learning (Evans *et al*., 2003; Smith *et al*., 2005) because it involves repeated analysis, evaluation and problem solving, and therefore its use by most students will depend on the facilitation and encouragement of the teacher (Vansteenkiste *et al.*, 2012). Although SRL is a trainable process (Zimmerman *et al.*, 2002), it appears necessary for students to build up from an original state of confusion, and therefore will need to be confronted with more complex tasks within a demanding learning environment (Vandervelde *et al*., 2017). Teachers will almost certainly need to make alterations to their style of teaching to create such an environment. In doing this teachers might be able to promote the intrinsic reasons for learning, build confidence in their students' ability to be a master over their own learning and lastly, reposition learning as a controllable process (Vansteenkiste *et al.*, 2012; Mega *et al*., 2014). Ironically, to

encourage student control, teachers need to create a more chaotic learning environment where the learning process might be seen as less controllable for the teacher, but in doing so should allow students to move from a position of dependence to one of greater independence and autonomy. Without independence, inevitably students will have less opportunity for problem solving. Vansteenkiste *et al.* (2012) argue that teachers should support this development by using inviting language such as “you can” rather than controlling language such as “you should”. In effect, the teacher moves from a modeling role to a coaching position (Vandervelde *et al*., 2017) allowing for additional support time and enhancing the agency of the students. However, Vansteenkiste *et al*. (2012) note that this ‘chaotic’ learning is not completely devoid of teacher involvement, rather, it focuses on minimising controlling tasks and language to support the students’ need for autonomy and agency which ultimately lessens the frustration caused. For example, it is highly unlikely that with unlimited freedom, students will set appropriate goals and learning expectations independently as they do not fully grasp the scale of the learning. Teachers, therefore, must act as a facilitator providing structure, meaningful rationale and effective scaffolding to aid the learning process (Vansteenkiste *et al.*, 2012). One might argue that this represents a bigger challenge to the teacher given the apparent unpredictability of the learning. Teachers have less control of the learning and therefore must react to a wider range of problems and questions, necessitating more extensive knowledge and broader preparation. This is perhaps a greater problem for novice teachers, than those who are more experienced, who may be less skilled in anticipating potential issues and reacting appropriately to challenges (Çakmak *et al.*, 2019).

Understanding the process and facilitation of SRL is helpful, but critically, assessment is necessary to judge the outcomes. SRL will take time and effort, both from the student and the teacher, and therefore, to make it worthwhile, the improvements in learning outcomes and additional benefits must exceed the costs. These advantages can be split into two groups: the short to medium term, and longer term.

2.2 Desirability of SRL

From the perspective of both the student and the teacher, learning outcomes in the form of exam success must be recognised in the short and medium term. Ultimately, A-level exam results shape the future of the students at least in the medium term and therefore hold significant weight. Zimmerman (2008), in addition to many others (Pintrich, 2004; Beishuizen and Steffens, 2011; Richardson *et al*., 2012), have found positive relationships between the use of SRL strategies and academic outcomes in traditional learning. Within the identified skills of SRL, there appears to be a particularly strong improvement in metacognition, effort regulation and time management (Richardson *et al*., 2012). These are all especially important for A-level economics due to the increased contextual complexity and autonomy of learning (Kitsantas, Reiser, and Doster, 2004). Thus, the positive correlation might be even more pronounced as students are better able to retain, integrate and transfer information at higher rates than students using surface-based learning approaches (Laird *et al*., 2008). In fact it could be argued that the use of SRL in education will bring even greater results in the future. As the dominance of the internet grows in our lives and the quantity of data multiplies at a staggering pace, Lee and Tsai (2011) argue that it is now imperative that students become more autonomous and self-regulated in their learning to prepare for future demands. Whilst the positive learning outcomes are apparent now, the future growth in technology and online knowledge should only enhance the potential success from effectively using SRL. Sorting and deciphering information, biases, perspectives and reliability will become a central challenge for the students of tomorrow. If education aims to 'future-proof' learning, then providing skills to deal with future trajectories must be essential.

Beyond these benefits there are also the social, emotional and motivational advantages in the short and medium term which might arise from the implementation of SRL. Given student preferences for autonomy and agency, the use of deeper approaches to learning such as SRL can improve satisfaction in the learning experience (Tagg, 2003; Laird *et al*., 2008). Through establishing, pursuing and fulfilling a learning goal, students encounter

motivational and emotional benefits as they discover a sense of purpose and enjoyment in the learning process that other learning styles, such as surface approaches, fail to deliver (Pintrich, 2004). It seems logical then that with greater satisfaction and enjoyment, students are more likely to pursue longer term goals to stretch their learning further, perhaps aiming for mastery within their subject area. Consequently, students might also change the path of their learning as they follow their interests to utilise a broader range of information sources (Hidi and Renninger, 2006). Some sources will be rejected out of choice, based on their evaluation of the merits, rather than confusion (Senko and Miles, 2008). In drawing on a wider range of materials, adding breadth to their learning, students will grow in their capability to rationalise their study and focus on the key information (Gogger-Frey *et al.*, 2017). Importantly, SRL should engender greater interest and satisfaction, improving learning outcomes, as students are more willing and comfortable to stray outside of the normal directed resources, broadening and deepening their understanding (Pintrich and de Groot, 1990). However, it must also be noted that mastery-oriented students may become so fixated on a topic that they stray along intriguing, yet tangential, lines of research. Consequently, students may gain an alternative knowledge that puts them in no better position to meet predetermined learning outcomes (Senko and Miles, 2008). In the context of economics and the strict specification of A-level exams, there is every risk that this broader learning may go unrewarded, albeit, this learning will be useful, interesting, and deep but within the context of examination the desired learning outcomes in the form of marks and grades may not be as positive as expected (Broekkamp *et al*., 2002). However, this might just strengthen the case for good teacher planning and scaffolding to encourage the process yet maintain direction to ensure key criteria is not ignored.

Whilst the noted benefits, in the short and medium term, primarily result in academic success, the longer term benefits could be just as useful in the working world. Thus, many would argue they hold even greater importance (Cleary & Zimmerman, 2004) and could be better understood as competencies or transferable skills. For example, SRL requires

students to build the skills of invention and problem solving to overcome obstacles in pursuit of logical and effective solutions (Glogger-Frey *et al.*, 2017). Many employers within the service economy are looking for those who can solve problems under pressure, draw on competing pieces of information and come to reasoned conclusions (The Economist, 2013). The practice of SRL thus allows students to find comfort and control in the disorientation of confusion and uncertainty (Mega *et al*., 2014). In essence, students learn to work through problems with calm rational logic rather than chaotic uncertainty. SRL enables students to identify the boundaries of one's knowledge, in a way that direct instruction does not (Sanchez *et al*. 2009), and therefore they are able to reach a more rational conclusion than if they had not established these parameters. Loibl *et al.* (2017) echo this in arguing that without an enhanced awareness of knowledge gaps, invention and problem solving is almost impossible. This is particularly important when moving into an area of study or work where more independence is necessary (Cleary and Zimmerman, 2004), with fewer opportunities to be redirected by peers or colleagues. Through SRL, a self-reflective approach is developed which helps monitor progress and efficiency in all areas of life, not just education.

Beyond individual reflective skills, the use of SRL is often promoted within a collaborative setting and therefore students' teamwork and communication are enriched. When working with others, one is forced to present coherent arguments that draw on both the information and the mood of the audience to pitch convincing contributions (Lau *et al*., 2008). One has to organise their understanding, elaborate on their answers and examine their own ideas to ensure they are accepted by others in the group. Without such skills, individuals would be less able to adequately navigate the working environment in many offices where negotiation, intelligence and 'people skills' are required in equal measure (Smith, 2013). The majority of people do not work independently but rather act within a wider team, at least in part of their role, and therefore will benefit from the self-regulated experience as part of their education.

Whilst the latter focus has been on the soft skills and competencies of working life, the assumption is that these would be of equal value in the school setting, particularly at A-level as students seek more independence (Vandevelde *et al.*, 2017). However, given the focus of this study on A-level student outcomes, attention will primarily be given to the more immediate success indicators, most notably grade outcomes. This does not diminish or ignore the value of the longer term outcomes; however, the scope of this study cannot do justice to a full investigation of such wide ranging results. However, it is recognised that all of the identified skills and competencies will undoubtedly have a positive impact on A-level learning outcomes and therefore they are included in their impacts, if not explicitly referred to. These benefits of SRL are now assessed through the use of flipped learning strategies.

3 Flipped learning

Flipped learning became widely used as a concept in education literature in the early 2000s, often referred to as 'inverted learning' (Ryan and Reid, 2016). It is frequently contrasted to the traditional classroom model, whereby a teacher instructs students on a range of new concepts and then allows them to process this learning in independent homework tasks. Students are expected to independently apply new theory to examples, thus requiring wider analytical thinking. Contrastingly, 'the essence of the flipped learning pedagogy is to stage learning of new material before class to free up class time for more in-depth explanation, practice, and productive use of knowledge' (He *et al.*, 2016, p61). Thus the typical division of student work is upended (Vignare, 2007). The current use of flipped learning as a concept, however, has evolved and is often used synonymously with the use of technology and online instructional videos which can be viewed from home (Woolf, 2010), something that was not available to previous generations. Online resources are used primarily for teaching the lower-order skills which can then be built on with the support, guidance and expertise of the teacher in lessons (Prunuske *et al.*, 2012). The

popularity of flipped learning has risen simultaneously with the exponential growth in online video technology and, notably, specialist providers such as Khan Academy or subject-specific Youtube channels, such as EconPlusDal for A-level economics. In addition, teachers can now create their own tailored online lessons on tablet computers capturing live explanations with whiteboard style illustrations and notes, to be subsequently viewed in the students' own time. Adoption of such resources has increased at breakneck speeds in the light of school lockdowns due to the Covid-19 pandemic (World Economic Forum, 2020). Technology has thus opened up, and promoted, the possibilities of flipped learning in education.

3.1 Flipped learning and SRL

Bergmann *et al.* (2012) suggest that flipped classrooms share a number of characteristics:

1. Students transform from passive listeners to active learners.
2. Technology often facilitates the endeavour.
3. Class time and traditional homework time are exchanged so that homework is done first and class time takes on a fluid structure to help personalise instruction.
4. Class time is used either to help students grasp especially challenging concepts or to help students engage in higher orders of critical thinking and problem solving.

These characteristics hint at the benefits of flipped learning, in line with SRL. Flipped learners become active users of a diverse range of information sources, incorporate depth through application to the real world, and aim to critically reason to solve complex problems. Although very similar in their outcomes, it should be noted that SRL and flipped learning are not necessarily synonymous; however, they are often combined in action with an appropriate learning design (Broadbent and Poon, 2015). The three phases of SRL are often used within flipped learning, either implicitly or explicitly, as the student is forced to plan, learn, and judge the effectiveness of their learning whilst self-learning new theory in their own time. Similarly to SRL, researchers suggest that flipped learning improves

self-efficacy, agency and ownership of the learning process as students are forced to master core knowledge independently and therefore take responsibility for the quality of that learning (O'Flaherty and Phillips, 2015). Subsequently, students are likely to be more engaged and autonomous and, hopefully, see the rewards of their own learning in practice. More able students, for example, might see the benefits of completing a task efficiently and moving on rather than having to wait for others in a traditional classroom environment. Flipped learning thus improves the accessibility and flexibility of learning (Waschull, 2001; He *et al*., 2016). However, flipped learning is not just for the higher ability students. One of the core advantages of flipped learning is that students can learn at their own pace, directing their efforts in line with their individual needs, pausing and rewinding the video when required (Davies *et al*., 2013; Roach, 2014). In pausing and rewinding students are acting in a self-regulated way, reviewing and repeating the learning process where they lack confidence in their understanding. In addition, practical and motivational benefits are evident as students do not feel like they are wasting their teachers' time or embarrassing themselves in front of their peers (Khan, 2011). In the early stages of learning a new topic, the student can often feel confused and vulnerable; however, with this type of learning a student is able to focus on the key material without 'falling behind' or being asked high pressure questions like "do you understand" (Khan, 2011). Subsequently, these unsettling moments for the students are less likely to arise in the first place given that the learning does not follow the average class pace. Therefore, students will feel more confident as further learning is constructed on top of the foundational knowledge. In addition, flipped learning can also feed back into the long term SRL as students can revisit learning weeks or months down the line with the same instructional quality rather than relying on often incomplete notes. The 'homework' part of the flip therefore encourages self-directed learning, greater agency and control, and more self-efficacy; however this only represents half of the flipped classroom.

Bergmann *et al.* (2012, p1) notes that classroom time with flipped learning is more significant arguing that 'it is the interaction and the meaningful learning activities that occur

during the face-to-face time that is most important.' This part of the learning compells students to make different contributions to solve problems, perhaps as part of a team, with

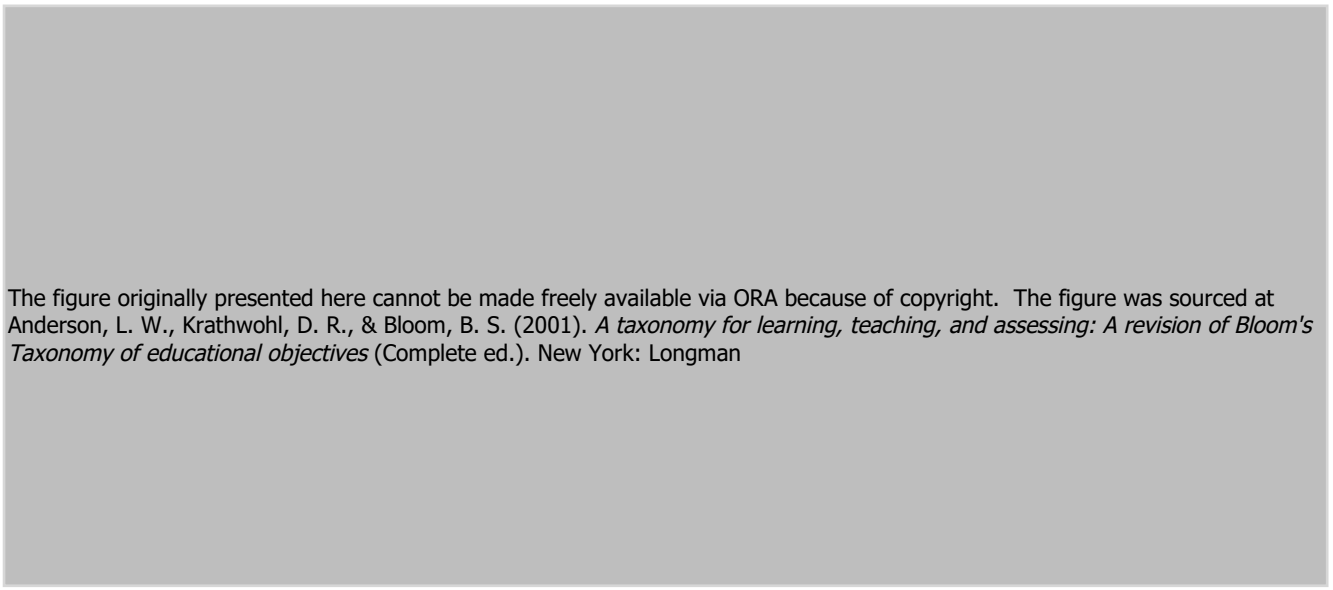


Figure 3: Bloom's taxonomy (revised) from 'A taxonomy of learning, teaching and assessing: A revision of Bloom's Taxonomy of educational objectives" (Anderson et al., 2001)

the teacher giving instant feedback and support, thus meeting student needs for reactive and immediate learning (Baepler *et al.*, 2014; O'Flaherty and Phillips, 2015). Consequently, class time is more powerful as the teacher can give precise support and remedial assistance when dealing with more complex higher order tasks (Davies *et al.*, 2013), as highlighted in the revised 'Bloom's Taxonomy' (Figure 3) above as Level 4, 5 & 6 processes. The value of the teacher, as the expert, is enhanced as their knowledge and wisdom can be tailored more appropriately to the students' needs during the most challenging stage of learning (Khan, 2011). Within class, students still follow the SRL framework but benefit from the additional resource of the teacher who supports the students' pursuit of their self-determined goals, rather than being directed externally. The teacher moves from 'sage on the stage' to a 'guide on the side' (King, 1993; Chi *et al.*, 2018). The repositioning of the teacher does not diminish, but evolves, their role to become more flexible and adaptive, freeing up time to support those most in need of assistance or extension. They become a facilitator, particularly when combined with team work, to encourage and assist learning of both content and skills. Subsequently, students

thrive within an active and collaborative learning environment, as they grapple with the content and discuss ideas with their peers to solve problems (Baepler *et al*., 2014; Roach, 2014). Knowledge and skills are honed through the combination of the student and teacher reaching consensus, rather than students thoughtlessly following the external authority of the teacher (Barkley *et al*., 2014). Subsequently, they benefit from wider skills of teamwork and communication, in addition to the powerful synergies of accumulated knowledge found through drawing together many learners. Thus, in freeing up time for more in-depth study and questioning, flipped learning appears to support SRL in building a deeper critical understanding of new learning.

3.2 Uncertainties with flipping

In spite of the benefits of flipped learning, appreciation must be given to the increased planning and preparation time required by teachers, especially in finding or creating suitable resources. This may represent a significant barrier to using such strategies in a notoriously time-poor profession (Roach, 2014). Goffe and Kauper (2014) found that the predominant reason for maintaining a lecture-based teaching style was due to preparation and time costs, with 16% of teachers mentioning time as a hindrance. Perhaps this is compounded by the motivational barriers of branching away from the teachers' usual delivery style, and thus comfort zone, which might have been honed and perfected over a number of years in the profession. In some cases, barriers could be even greater given that the online resources may not have been specifically created for the task, without the involvement of teachers or curriculum experts (Chi *et al*., 2018). In addition to the time required to create new and specific content, teachers would potentially need intermediate technological skills, and specialist devices and software. Thus, the time burden and skill deficiency could reduce adoption in spite of the potential benefits.

Additionally, given the need for student autonomy and control, a large proportion of the success also lies with the students themselves. Chen (2016) found that students were, like teachers, sceptical and resistant to the new style of learning in the early stages of a

change, often preferring the familiarity of the traditional learning approaches. Through relinquishing control by giving autonomy to the students, subsequent lessons are effectively left at the mercy of students' diligence, planning and motivation. As a result, students would often arrive at lessons unprepared as they did not appreciate the importance of the pre-class study, viewing it as 'extra work' as opposed to a simple shift in workload (He *et al*., 2016). Consequently, O'Flaherty and Phillips (2015) found that teachers would have to deal with even greater diversity as some students understood concepts whereas others had not even looked at them. He *et al.* (2016) noted that this trend grew more common as the complexity of the pre-class learning expanded in tandem with the students' other courses becoming increasingly demanding, which they labeled as 'unintended non-compliance'. Subsequently non-compliance, both unintentional and intentional, resulted in negative impacts on both the under-prepared and well-prepared. Teachers would have to revisit the core knowledge in greater detail, slowing down the learning, but also preventing the well-prepared students from extending and advancing their understanding (He *et al*., 2016). In this light, there appears to be a juxtaposition between giving students autonomy and the need to maintain tight control over their completion of pre-class work. Balance must be found in ensuring that ineffective work from the few does not negatively impact the majority. Although managing behaviour and distractions in lessons is a common problem for teachers, non-compliance in flipped learning appears to be a bigger obstacle as it happens outside of the classroom, a domain beyond the direct control of the teacher.

Perhaps this points to why there is limited evidence of significant long term impacts of flipped learning in the literature, with positive impacts diminishing over time (Hamdan *et al*, 2013; He *et al*., 2016). In fact, in the study conducted by He *et al.* (2016), findings suggest that, as time goes on, attitudes regarding flipped learning tend towards the extremes, resulting in some students praising the improved quality of student-teacher interaction whilst others ask "when will I be taught again?" Fundamentally, educating and inspiring students of the benefits prior to implementing a flipped structure appears necessary before

they make misguided arguments about the quality of their learning, and in doing so fulfil their own prophecy. However, He *et al.* (2016) argues that novelty might be a better reason for the improvement and subsequent diminishing impacts, seeing the outcomes as a sign of the 'Hawthorne Effect' where a change in the operating procedure increases worker productivity just because it is new and different (Cook, 1962). Perhaps, then, flipped learning should not be used to overhaul teaching practice to improve SRL but rather should be one of many strategies to promote positive learning outcomes. Whether through novelty or interest, the benefits are still clear, at least in the short term, and therefore with the right motivations and willingness from teachers and students it could bring about positive change for A-level economists.

4 Motivation

The word 'motivation' originates from the Latin verb *movere*, which means 'to move', and so as a starting point motivation refers to the ability to move forward (Schunk *et al.*, 2014). It encapsulates why we act in certain ways; our thoughts, actions and behaviours (Weiner, 1992). From the perspective of education, it can be understood as 'students' energy and drive to learn, work effectively and achieve to their full potential at school, and the behaviours that follow from this energy and drive' (Martin, 2002, p35). Whilst some argue that homework should be enjoyable and challenging (Stern, 2009), others suggest that too much challenge results in frustration and decreased motivation (Davies *et al*., 2013).

Although this vast topic is cited in influencing a broad range of circumstances and subject areas, making it hard to decipher (Smith *et al*., 2005a), when interpreting motivation within the specific context of flipped learning and SRL, attention must be given to how it impacts student autonomy and resilience. Rather than passively listening with the hope of remembering information, students engaging in flipped learning are required to actively participate, consider, review and evaluate. Thus, it can be a mentally taxing process for students as it requires greater processing and perseverance, as suggested by cognitive

load theory, the premise that working memory has a limited capacity and that overloading it reduces the effectiveness of learning. (Sweller, 1988; Evans *et al*., 2003). Appreciating the impacts of motivation, therefore, is fundamental in fostering successful learning outcomes through SRL and flipped learning as students' actions and thoughts shape the learning outcomes. The implicit reliance on student autonomy means that motivation must not simply be seen as important, but as a fundamental precondition for deeper, more successful learning (Rozendaal *et al.*, 2005). Simply, success is pinned on student motivation (Wang *et al*., 2013).

Subsequently, the question must be asked about how to use motivation to elicit the most positive response to the demands and challenges of SRL. Motivational influences, both positive and negative, will shape the outcomes of SRL strategies through interest, persistence and anxiety related behaviours (Rozendaal *et al*., 2005). Devoid of significant positive motivation, students will typically pursue a surface strategy (Ahmed *et al*., 2013), or even give up all together, resulting in non-compliance. Consequently, the adoption of SRL is built on the foundations of interest and desire. Duckworth (2017) echoes this sentiment when arguing that 'nobody works doggedly on something they don't find intrinsically interesting'. In addition, she suggests that 'grit', or long term perseverance, is a much better predictor of success than any other measure of talent or skill (Duckworth, 2017). Without interest, a student is unlikely to have long-term perseverance in any activity and consequently, without positive motivation, the likelihood of engaging in SRL is dramatically reduced. Mega *et al.* (2014), when studying SRL and motivation, found that the effect of motivation on academic achievement was double that of SRL. In requiring students to solve problems, pursue new knowledge and extend their explanations, the foundations are laid for even greater temptation not to comply. Students do not just need the 'will' and the 'skill' to succeed (Pintrich and De Groot, 1990), they also need the 'thrill' (Ahmed *et al.*, 2013). Greater internal motivation, or 'thrill', is needed to overcome negative motivators such as anxiety and self-handicapping in order to support the autonomy of SRL.

4.1 Intrinsic and extrinsic motivation

Within motivation discourse, there is a separation between intrinsic and extrinsic motivation (Ryan and Deci, 2009). Whilst extrinsic motivation develops from external reward structures, intrinsic motivation is understood to derive from an internal desire or interest, promoting autonomy and controlled action (Deci and Ryan, 1985). Thus, intrinsically motivated students regulate their actions to meet goals that feed and extend their interest. Consequently, intrinsic motivation is predominantly associated with interest (Hidi & Renninger, 2006) as enjoyment and value are established in completing a task (Wigfield and Cambria, 2010) and from general academic achievement (Pekrun *et al*., 2011). Positive emotions are thus essential in motivating favourable academic outcomes, in contrast to negative emotions such as hopelessness which relates negatively to achievement (Pekrun *et al.*, 2011). However, it would be inaccurate to suggest that pure enjoyment is a prerequisite of intrinsically motivated students, rather that, in appreciating the future value of a task, one cultivates positive motivation in the present. Intrinsically motivated students respond not only to their current calculated utility but also to perceptions of future utility (Eccles *et al*., 1983). It thus seems pertinent that, to promote SRL, intrinsic motivation should be prioritised through enhancing students' perception of the personal value of learning tasks, both in the present and future. An intrinsically motivated student recognises that, in spite of frustration and difficult learning tasks in the short run, significant benefits are found in the long run which endorse their increased exertion. A teacher, therefore, should encourage their students to recognise and aspire to these long term outcomes. When students have this internal belief and motivation, they are more likely to be self-regulating (Linnenbrink & Pintrich, 2003).

In contrast, extrinsic motivation is developed through external forces, often in the regulation of behaviour by the teacher, the opposite of self-regulation. It is more commonly associated with surface learning as students are conditioned to conform to an expected process but not to personally question or assess their learning. Rather, the teaching may be focused on reaching an end point or controlling class behaviour, resulting in passivity

(Smith *et al.*, 2005a). Extrinsically motivated students, consequently, are unlikely to develop long term perseverance and self-regulation strategies as purpose is achieved in the moment through extrinsic reward influences (Thomas *et al*., 2007). Ultimately, students lose their autonomy and a long term perspective is marginalised to conform in the short term. Worryingly, this might further extenuate the cycle of negative motivation and declining learning outcomes, as the lack of autonomy might bring about further anxiety, low confidence, procrastination and work avoidance (Wolters, 2003; Pekrun, 2006). A focus on building intrinsic motivation and minimising extrinsic motivators seems necessary to bring about the gains of SRL. Evans *et al.* (2003) suggest that, without intrinsic motivation, students are unlikely to even attempt to use SRL, and therefore motivation should be carefully considered by teachers when planning lessons.

4.2 Cultivating motivation

Students who believe they are capable will use SRL in spite of previous achievement, difficulties or ability (Schunk and Ertmer, 2000; Pajares, 2008). Consequently, the actions of the teacher become an important obstruction or aid to deeper learning and therefore teachers should aim to cultivate a favourable atmosphere as a function of their teaching (Marsh, Martin and Cheng, 2008). They should identify and appreciate both the motivational orientations and the behaviours of their students (Martin and Marsh, 2003). Motivational orientations can be understood as beliefs or emotions whereas student behaviours are associated with actions and processes to reach a goal (Martin, 2002). If teachers are successful in promoting SRL students will grow in academic resilience, which is understood as the process of, capacity for, or outcome of successful adaptation despite threatening or challenging circumstances (Howard and Johnson, 2000).

However, Reason *et al.* (2010) suggest that being in an environment which encourages SRL will not of itself benefit students, since effort must also be present. For students to be willing and able to deal with learning obstacles, Martin (2002) highlights self-belief, or self-efficacy, as the primary motivating factor (Bandura, 1997; Schunk & Pajares, 2009). A

student's self belief, consequently, becomes one of the leading predictors of both enjoyment and achievement at school (Marsh, 1990; Bandura, 1997; Martin and Debus, 1998; Schunk & Pajares, 2009). Positive orientations prime students to wholeheartedly commit to learning tasks and adopt a favourable attitude to their studies, leading to improved focus, commitment and resilience: three characteristics which are essential for successful SRL. Thus, students reposition success away from external regulation and redirect focus towards an opportunity for growth through a 'personal best' culture (Covington, 1992). This is most evident in the self-assessment phase as students are more inclined to set stretching goals that systematically raise expectations, promoting a marginal gains approach to learning in pursuit of expert status (Duckworth, 2017). Thus, the positive motivation orientation feeds into better behaviours for SRL. If teachers can promote these orientations, students are more likely to adopt SRL strategies.

Understanding that self-efficacy facilitates cognitive engagement is important (Schunk, 1985) as students will display higher self-regulation, to boost their chances of academic accomplishment, with growing self-belief. Such orientations lead to improved behaviours, but also behaviours can alter the orientations. Martin (2002) asserts that encouraging students in establishing goals and aiding the processes of planning, reviewing and overcoming obstacles will improve general motivation, and subsequently foster the evolution of positive self belief. This is particularly important for flipped learning where autonomy is fundamental to success. However, successful use of these deeper learning strategies is only evident when the learning task warrants their use (Smith and Colby, 2007) and thus, to cultivate SRL, careful planning is important. Teachers play an essential role, therefore, in constructing the right motivational atmosphere and learning tasks to facilitate and encourage effective use of SRL.

Teachers must cultivate the right motivational atmosphere by encouraging resilience, independence and personal challenge, otherwise a flipped learning approach could result in no change or even negative learning outcomes as students disengage. Teachers should welcome an environment that gives students the opportunities to seek challenges, take

responsibility and reflect on their progress, whilst maintaining and promoting positive motivation (Paris and Paris, 2001).

5 Conclusions

Whilst there is a wide variety of research into SRL and flipped learning, there is still much debate over the overall success of such strategies in terms of learning outcomes. Some research is focused on economics (Chen and Lin, 2012) whilst other research on A-level or high school students: however, there is a lack of research specifically combining both. Therefore, further exploration in this study is warranted to fill the void, which can then be compared to the greater wealth of research around the topic.

Success was seen to be multifaceted with numerous interpretations in specific scenarios. In the context of A-level economics study, however, the focus was on successful learning outcomes which mostly demanded positive exam results at the end of the course, but also recognised learning practice and progress as key metrics. The demand for deeper learning, as opposed to surface learning, promoted active student engagement in their work, often building towards the goal of mastery. As this is linked to both outcomes and behaviours it can be understood to be the most appropriate form of success in the A-level economics context. SRL represented a key strategy which could facilitate the student in building towards these outcomes, by prioritising the autonomy of the learner and meeting self-assessed goals. It is recognised that complete autonomy may not be desirable for all students but, with scaffolding and review, teachers could monitor and encourage the right learning outcomes. Contrary to traditional teaching methods, flipped learning represented a useful approach to encourage the goal of autonomy whilst maintaining control and developing effective feedback loops between the teacher and their students. Technology, when used well, can have a big impact on this approach (Davies *et al*., 2013) and is becoming a particularly prominent part of flipped learning discourse. Technology both supports autonomy and also presents the teacher with insightful data to monitor learning

progression from a distance and provide tailored information resources. However, there has been some debate over the success of flipped learning, notably in the longer term as students lose interest or fall behind. Motivation thus becomes increasingly important as autonomy and positive motivation are intrinsically aligned. Therefore, when considering the success of SRL through flipped learning, student motivation must also be investigated. For example, without the favoured positive motivation, some students might be tempted to 'game' the system and thus pursue surface learning strategies resulting in poor long term success. It would be unwise to ignore the interdependence between SRL and motivation: rather, an integrated approach should be adopted to reach better understandings and constructions of successful learning.

Whilst the benefits of SRL appear unambiguous, what is less obvious is whether these outcomes will be evident in the context of an A-level economics classroom. I therefore decided to design an intervention to better understand whether successful outcomes are achieved through flipped learning, with attention being paid to how motivation appears to enhance or limit the outcomes. Answers to the following research questions were sought:

1. How effectively do economics students adapt to a flipped learning approach?

2. Is there evidence of improved learning outcomes?

3. How evident are motivation factors in student engagement and compliance?

Methodology

1 Overview

Building from the literature review, practitioner research was undertaken to study SRL and flipped learning in response to the stated research questions. The study was designed to both assess the applicability of current literature within a new context of A-level Economics, but also broaden the field of research through discovering unanticipated reflections from students and teachers. Therefore, whilst broad findings were sought in line with many other studies, the research also hoped to highlight personal insights which could illuminate some of the complexities of the topic. The intention is that teachers can use this research to shape future approaches to learning for economics students within the research school and further afield, as well as provide valuable subject-specific research that can be compared to other subjects and age groups.

A dual research focus, studying both flipped learning implementation and motivation factors, required a similarly broad study design to contribute a rich and reliable understanding of the combined topics (Creswell and Plano Clark, 2011). Mixed Methods Research (MMR) fulfilled this need as both qualitative and quantitative data were combined to improve the depth of analysis through mutual illumination of different aspects of the study (Bryman, 2007). With increased corroboration of data, this method helped to render less biased and more accurate conclusions (Reams and Twale, 2008). Although a specific focus on either qualitative or quantitative research could provide a legitimate understanding of the topic, when taken individually they might have only provided a partial interpretation of what has proven to be a complex area of study (Creswell and Plano Clark, 2011). MMR thus provided the best approach to reach a comprehensive and complete understanding (Cohen *et al.*, 2018). As an effective way to triangulate findings, MMR also helps to map out and explain more fully the richness and complexity of human behaviour (Cohen *et al.*, 2018), supporting the validity and reliability of conclusions made. Whilst it is recognised that threats to validity and reliability can never be eliminated completely,

particularly for abstract or indirectly observable constructs such as anxiety and motivation (Shadish *et al*, 2002), this approach was selected to minimise these threats as far as possible. Ary *et al* (2002) note that validity is not just about whether the data collection is correct but whether the meaning and interpretation is true. Comparisons between multiple forms of data collection, including interviews, surveys, tests and teacher observations, helped minimise the risk of misinterpretation and improve the credibility of the research. In addition, observations and findings were discussed in collaboration with other teachers within the common room and with members of the weekly 'Teaching and Learning Group' helping to develop and critique the process and data collection methods.

2 Intervention

The intervention was completed over a two week period at the start of the spring term. The whole of the lower 6th form (L6th) economics cohort participated in the intervention which involved a complete change from their usual lesson structure to a flipped learning system. Students had already completed one term of the course and were therefore well acquainted with the usual style of lesson which included a mixture of teacher explanation and lecturing, group discussion and debate, individual reading and questioning activities, and whole-class feedback. Whilst there was a familiar structure to most lessons, students expected a diverse range of tasks and activities to build different skills. Due to the small size of the cohort, 36 students, it was decided that the whole group would be included in the sample to improve validity and reliability, opening up the intervention to more sophisticated analysis (Cohen *et al*., 2018). The L6th cohort was chosen, as opposed to U6th, following collaborative discussion with the Director of Learning and Head of Department who both suggested that the students would be more receptive to the change given they were earlier on in their course of study, and thus further from their final exams. This would mean they could have more time to benefit from successes or work back over areas of confusion following the intervention. There had also been an attempt to fully adopt

flipped learning in A-level Science in the school a few years earlier, which was met by student and parent complaints and therefore careful consideration of the methods used in the intervention was essential, learning from past issues. Collaboration with the teachers involved was essential in managing communication and highlighting potential struggles that students might have faced.

The intervention adapted the model of the flipped classroom to improve the capacity of data collection, follow school guidelines on the length of homework and to respond to collaborative feedback surrounding previous issues. Students would work independently on knowledge acquisition in two of three lessons each week, whilst the third was reserved for a discussion and debate focused on critically analysing and evaluating knowledge through constructing answers to exam style questions. Whilst this decision did not represent a complete flip of the classroom, with all independent knowledge acquisition happening at home, it allowed for better observation of behaviours and motivators in this half of the flip which has been hard to directly observe in other studies. Students were still completely independent during these periods and worked through tasks as if they had been at home or in a free period. Students were given task sheets (see Appendix 1 for an example) with suggested reading and videos to build towards meeting a prescribed learning checklist, which ended with a self-assessment multiple choice quiz to enable effective self-regulation cycles. Students were required to complete four task sheets before each teacher-led lesson, which necessitated time management across class and independent study time. During the teacher-led active lesson students were encouraged to contribute and use their knowledge to build arguments and assess key problems. The emphasis was placed on students using their knowledge and making contributions to small group or whole class discussion. These lessons focused on exam skills to maintain the direction of their learning and meet the learning aims, as examined at the end of the course. Independent knowledge was thus developed into higher level skills.

The two week duration was chosen to align with the course content and provide adequate opportunity to evaluate the success of the programme, particularly with regard to

motivation. This gave ample opportunity to observe behaviours, successes, struggles, listen to student feedback and move beyond the novelty of the Hawthorne Effect (He *et al*., 2016). The intention was to complete an additional, longer intervention later in the course to add reliability and validity, implement changes from the phase one findings, and to build a better long-term understanding of flipped learning. This plan was not possible following the closure of schools in late March due to the global COVID-19 pandemic.

3 Data Collection

In line with the principles of MMR, a variety of data collection methods were used to improve the richness and reliability of the research, as follows.

3.1 Surveys

Surveys were used after the first 45 minutes of the monitored lesson time and at the end of the two week intervention. A survey was chosen to gain a better understanding of the perceptions, emotions and motivations of the students, which could then be assessed further in interviews and triangulated with other data collection methods. Following a common format for educational research, the surveys were completed online (Denscombe, 2014), due to the speed, convenience, favourable participant response rate and ease of checking and analysing responses (Cohen *et al.*, 2018). A Google Forms survey was chosen because the students were accustomed to using this suite of programmes and all have access to iPads so they could be completed instantly. Completion of the survey was a sign of informed consent (Roberts and Allen, 2015) and data was stored within the school's encrypted Google Cloud Storage, in line with normal working practice.

The first survey was a very simple snapshot of the participants' feelings in moving to a new style of work. The structure of the survey followed Cohen *et al.*'s (2018) suggestion to include both ratings scales and open-ended questions, rating their learning experience on a scale of 1 to 5, with 1 representing the less favourable response, before giving a brief

comment on their perceptions of the learning approach. The two ends of the spectrum were defined with words to reduce confusion and improve reliability of the data (Friedman & Amoo, 1999; Krosnick and Presser, 2010; Champagne, 2014). Within the ratings scales, students recorded their perceptions of the level of challenge, the depth of their learning, the confidence they had in their learning, and their motivation levels (see Appendix 2 for an example). The intention of the initial survey was to gather a snapshot of student perceptions, rather than in-depth insights, which could be compared to the final survey at the end of the intervention.

The post-intervention survey began with the same ratings scales, for comparative purposes. It then opened into a semi-structured style with open-ended questions to gain critical insights which might not have been evident from other data collection methods, with the hope of finding 'gems' of information (Cohen *et al*., 2018). The questions were designed to delve into the thoughts, behaviours and motivations of the students as they adopted the flipped learning approach. Questions centred around comparative analysis of the quantity and quality of their work, time spent in comparison to normal working, feelings and motivation. They also asked whether the students would adopt all or part of the learning style in the future and how the process might be improved if implemented again in the future. The scope of the sample meant that key themes could be sought and then followed up on in a group interview to pursue greater depth and clarification where trends and anomalies were evident.

3.2 Group interview

An interview allows for people to be seen not as data but as sources of valuable human knowledge through conversation (Kvale, 1996). Issues can be explored in depth to add to the growing richness and reliability of the study (Hochschild, 2009). In this study, it was important to allow respondents to demonstrate their unique ways of seeing the intervention through the use of open-ended questions (Silverman, 1993), thus adding vibrancy and colour to the other data collection methods. The interview was essential in clarifying,

building on and seeking explanation for previous findings. Therefore, sequential mixed methods sampling was adopted as the preceding data from the complete group sample helped to select the participants of the group interview (Teddlie and Tashakkori, 2009). This represented a purposeful sample whereby participants were selected on a judgment of the typicality of their perspectives, as well as reflecting the gender, ethnicity and ability characteristics of the cohort (Cohen *et al.*, 2018). A combination of negative and positive case sampling was used to encourage debate and represent conflicting perspectives, leading to improved comparisons and the opportunity to focus on specific issues, thus resulting in greater depth but less breadth (Anderson and Arsenault, 1998). A group interview was therefore understood to give a more reliable and complete record (Arksey and Knight, 1999) which would provide a complex web of communication (Leshem, 2012). Whilst this complexity could be seen as a negative outcome, the addition of complexity into the mixture of other research methods further adds to the reliability and validity of the study. Lewis (1992) suggests that 6-7 participants is optimum for a group interview and therefore two representatives from each class were chosen based on their previous responses. This allowed all participants sufficient time to build on, or argue against, the ideas of their peers without compromising on the depth of explanation and thus richness of the data.

Kvale (1996) describes two approaches when conducting interviews; that of the 'miner', whereby the interviewee is used as a source of valuable information which needs to be extracted, and of the 'traveller', whereby the interviewer and interviewee both go on a journey of discussion and learning leading to an unknown destination. A combination of the two styles was used to ensure additional insight was gained on key topics from previous data collection, but also to provide opportunities for the interviewees to identify and explain their own ideas which they considered to be worth sharing. Teacher observations were particularly important in designing the questions to assess the validity of the prior interpretations of class behaviour. Open questions were used to encourage students to build and discuss key topics (see Appendix 3). When clarification was needed, the

interviewer gave a summary of their understanding and students were encouraged to clarify and add more detail. This all helped to improve the validity and reliability of the data as well as improve the richness of the earlier data collected.

3.3 Teacher observation

Teacher observation, as a vital element of the mixed methods approach, helps to validate the findings of student perceptions and feed forward into the interview, triangulating the research and mapping out the richness and complexity of student behaviour (Cohen *et al*., 2018). Observation is 'looking (often systematically) and noting systematically people, events, behaviours, settings, artefacts and routines' (Simpson and Tusan, 2003). Therefore, including teacher observation helped to shine a light on the rich contextual information found through the many verbal and non-verbal interactions in a classroom (Clark *et al*., 2009). These may have otherwise gone unnoticed and thus unrecorded if relying solely on other methods such as participant self-reporting and interviews, and thus observation also acted as a reality check. Importantly, it identified topics which would benefit from exploration in the interviews, further adding to the reliability and validity of the research.

Participant observation provided the most useful and unobtrusive approach as I, the teacher, had free access to the students' behaviours and activities without impacting the normal working environment. Given that students expected to see me, observation was likely to have been less intrusive and became 'as familiar and unnoticed as everyday objects and part of the furniture' (Watts, 2011). Consequently, whilst the observation was not covert, it was unnoticed by the students. During each lesson, a semi-structured system was used in line with the themes of the research, notes were made both during and after the lesson, and then reflective comments were completed to give an overarching summary. Caution was taken to ensure note-taking was not obvious, thereby influencing student behaviour. Observation centred around engagement, focus, signs of difficulty and motivation. Significant comments made by the students were also noted down. A final

review highlighted areas of confusion or interest which could be compared to other data and scrutinised in the interview.

3.4 Tests

Testing provides useful quantitative data to triangulate the findings from the other methods of research. A summative pre-test and post-test system was adopted to assess whether students had made measurable improvements in their achievement outcomes (Cohen *et al.*, 2018). Two assessment styles were used: a timed test and an essay assignment. These assessments both followed the normal test structure that the students were accustomed to, focusing on knowledge, analysis and evaluating theory. Given that students were used to regular testing and essay writing as part of their economics course, it was unlikely that this process would have distorted their behaviours beyond the normal expectations when preparing for an assessment. Whilst Cohen *et al.* (2008) suggest that motivation will impact performance, it was decided that this would have been just as evident in previous tests, minimising the significance of the impact.

Self-assessment quizzes were also provided following each task sheet. Whilst these were primarily designed for the students' self-regulated learning, they also revealed useful data on the speed of progress, the number of test attempts and the time between retesting. The final data point is particularly useful as it highlights how well students were self-regulating. A sizable gap between retests suggests that students were going back to their notes and reviewing their mistakes, whereas a minimal delay suggests that students might have been motivated by beating the test rather than maximising their learning. This data would provide an interesting topic to compare with teacher observations and follow up on in interviews.

4 Ethics

Research was conducted in line with the British Educational Research Association's (BERA) guidelines (2018). Written consent for the intervention was given by the Headmaster and numerous informal discussions had been conducted with the Head of Economics, Director of Learning and Curriculum Director. It is recognised that ethics are not a 'black-and-white' issue but need to be interpreted in specific, local situations (Simons and Usher, 2000). The nature of the study, following the teacher's normal way of working, means that power relations, learning dynamics and access to education remain unchanged and thus represent no obvious ethical issues.

Whilst much of the intervention followed the curriculum, and therefore students could not opt out of the flipped learning approach, they were given a real and legitimate opportunity to opt out of the surveys and interviews (Graham *et al.*, 2013). Before the study began, students were given a 10 minute introduction to the broad objectives and processes of the study as well as what the research would be used for, providing informed consent. Students were then given the opportunity to ask questions or raise concerns. Surveys used Google Forms which allowed for complete respondent anonymity, thus reassuring students that their participation decisions could not be traced back to them. It also meant they had freedom to report their feelings and observations openly. Data was stored on school Google cloud-based storage using password protection.

The method of data collection with the most ethical considerations was the group interview, both in asymmetric power relations and sampling judgements required. It is well recognised that interviewing is particularly problematic in education (Morrison, 2013) with younger children often wanting to give answers that the researcher might want to hear (Hitchcock and Hughes, 1989). This concern was partly mitigated by the age range of the participants (16-18 years old), who would have been less prone to pleasing the researcher, whilst steps were also taken to continually remind students of the value of all comments and the lack of 'correct' answers. This was emphasised throughout the intervention, and

was backed up by a good relationship between the students and teacher which encouraged open communication. Therefore, whilst power relations are immanent in all research settings (Brooks *et al*., 2014), every effort was made to reduce the impacts and thus improve validity and reliability. Students were also reminded that anything they said in the interview would be anonymised, and original recordings would not be heard by those outside of the study, and thus no comments could be directly traced back to them. Recordings were made and stored on a school password protected iPad, using the Voice Memo app.

Sampling was also a concern to ensure representativeness. A small sample was chosen for the interview which meant that not all voices in the total research sample could be heard. Participants were chosen for their typicality, representativeness and availability based on five factors:

1. Two participants were selected from each class to represent the feelings, dynamics and observations witnessed in their set.

2. Participants represented both positive and negative opinions, based on teacher observations and student comments.

3. The sample broadly represented the total research population by ability, gender and cultural background.

4. Students had to be free from lessons or extra-curricular activities to ensure access to the students at the same time.

5. Willingness to contribute - all students were invited to attend but given the option to opt-out.

These principles meant that ethical issues and reliability of the study were prioritised in the data collection, minimising the risk of bias. Student welfare was prioritised and continual communication helped to maintain understanding across the whole research population.

5 Impact of COVID-19

The global COVID-19 pandemic necessitated widespread government intervention to mitigate against the potential for major loss of life within the population. In the UK, this included shutting down schools from 23rd March 2020. Although the first phase of the intervention and data collection was complete by this point, the planned second phase was not possible and therefore neither were adapting the model and studying longer term factors. Findings and discussion were developed based on the first round data but without a second phase conclusions were necessarily limited. Feedback from the study was also planned to be presented in the Teaching and Learning group, but this has been postponed.

Findings and Discussion

The mixed methods approach uncovered a range of data, perspectives and opinions that all help to illustrate and decipher whether flipped learning enhances the success of SRL. As expected with the broad scope of the study, the data reveal a spectrum of results highlighting the complexity and richness of the examined topic. Each individual method of data collection revealed diverse reactions within this spectrum, in some cases polarising towards the extremes. Whilst the quantitative data provide a granular picture with mixed conclusions, the surveys, interview and observations help to add colour and richness to the study enabling suggestions of causality to the preliminary findings. Three broad themes were evident within the research:

1. Mixed learning outcomes
2. Partial adoption of the SRL framework
3. The impact of motivation

1 Mixed learning outcomes

In spite of researchers such as Zimmerman (2000) and Ness and Middleton (2012) highlighting the positive link between SRL and academic results, this connection was not immediately clear in this study. Rather, in line with other research (Elliot and Church, 1997, Senko and Miles, 2008; He *et al.*, 2016), the intervention resulted in a diverse and intriguing range of evidence of improved learning outcomes. This assessment is based on the pre- and post-assessment performance data with the test results suggesting a negative intervention impact while the essays showed a positive intervention impact. The learning outcomes, when measured with the test, fell by 4% with students achieving an average of 24.6 out of 40 on the pre-test and 23.6 out of 40 in the post-test. When measured by the essay, however, outcomes increased by 13% with students achieving an average of 14.9 out of 25 in the pre-intervention essay and 16.0 out of 25 in the post-intervention essay.

Whilst the percentage improvement from the essay assessment outweighs the negative impact as measured by the test, it is worth noting that the average difference between pre- and post-assessment in both cases is approximately one mark, and thus there doesn't appear to be a significant case for success or failure of the intervention based primarily on this data. However, there are intricacies within the data that might uncover reasons for the inconclusivity. Firstly, the difference in assessment approaches means the learning outcomes can be seen through a lens that suggests not a success or failure but a shift from one type of learning to another. Secondly, it may also highlight that within the economics A-level course, not all theories and concepts incur the same cognitive burden and therefore some learning is more difficult to recall and explain.

1.1 Shifting learning

The structure of the test focused largely on knowledge with the majority of questions assessing student understanding of concepts and theories, with inquiries into specific elements of the new theories. In economics, the required knowledge largely centres around interpreting and manipulating diagrams. Conversely, although essays do require accurate and precise use of knowledge, the vast majority of marks are awarded to higher order skills, such as analysing the implementation of theory within a context and evaluating potential successes and failures through gathering and interpreting multiple observations. Glogger-Frey *et al.* (2017) suggest that traditional direct instruction leads to superficial knowledge and difficulty with knowledge transfer tasks. Perhaps this suggests why students were achieving lower marks in the pre-intervention essay as they understood theories but could not critique them, a suggestion supported by Ramsden's (2003) comment that superficial knowledge has 'nothing to do with wisdom and everything to do with aimless accumulation'. Prior to the intervention, students might have prioritised the accumulation of knowledge rather than grasping the complexities and relationships between distinct concepts and thus struggled with essay assessments. Given that the SRL framework encouraged deeper learning, students began to move away from the potential of a 'restrictive learning process' (Entwistle, 2000, p2) in the traditional system to prioritise

seeking patterns and principles in order to examine the logic of an argument (Entwistle, 2000). Students could thus use knowledge within a context to build stronger arguments and present deep, critical and insightful analysis. In contrast, the traditional learning approach might have encouraged surface learning resulting in students reaching a learning ceiling devoid of logic and wisdom. Subsequently, they become confused with how to proceed with essay assignments because they lack the meaningful connections within their learning (Evans *et al*., 2003). Although the boundaries of knowledge are similar, the connections within this knowledge are less advanced, as highlighted through essay assessments. Based solely on the essay assessment data, therefore, there appears to be the expected positive correlation between learning outcomes and SRL through flipped learning (Zimmerman, 2000). The anticipated improvement in dealing with complexity, resolving problems and challenging assumptions led to increased capability with essays, albeit a small improvement (Ness and Middleton, 2012). What is more interesting, however, is the decline in learning outcomes when assessed with a test.

It was not anticipated that, through prioritising deeper learning strategies, students might regress in their ability to recite and use knowledge, frequently understood as a surface skill. A decline within an assessment structure centred around examining knowledge was unexpected given that this knowledge was understood to be a precondition for the analytical and evaluative skills (Rozendaal *et al.*, 2005). Whilst knowledge is essential for effective analysis and evaluation, it could be suggested that the depth and precision of knowledge is less important, at least in the students' eyes. Given that the flipped learning model gave agency and independence to students, they were at liberty to make personal assessments of their own learning and subsequently to reduce the importance of precise understanding. Students may have opted to skim over the detail of the knowledge in order to prioritise connections, aligning with Entwistle's (2000, p2) claim that students will focus on seeking 'patterns and principles'. Thus, if students find a pattern in the given domain, they may be unlikely to further explore the intricacies of that domain because they already see how it fits with other areas of knowledge. The additional detail is perceived to add little

to the overall understanding. This assertion is supported by cognitive load theory (Sweller, 1988), as deeper learning is so resource intensive, requiring reading widely, thinking and making connections, that additional burdens of precision might be neglected (Evans *et al*., 2003).

Survey data supports this assertion about reducing the importance of detail. Students reported finding the experience challenging, increasingly so as the intervention progressed, and motivation fell as well. The combination of these factors hints at reasons why detail may not have been prioritised. When discussing these findings with the Teaching and Learning Group, many commented that this might not be a sign of a failure of learning but, contrarily, evidence for the complexity of the learning process. Colleagues proposed that it might instead be a recognition of students doing precisely what the flipped learning process encouraged: to organise and prioritise work. Overall, when looking at both essay and test data there was an improvement but other factors meant that some areas of knowledge were labelled by students as less important. Whilst motivation issues are discussed in more detail later, there are hints here that a mastery focus is not evident for most students. As Evans *et al.* (2003) predicted, student choices around cognitive efficiency due to motivation appear to mean that students succeed on one measure of performance but regress in another.

1.2 Difficulty and complexity

A second explanation for the trends in learning outcomes is associated with the complexity of the knowledge domain. Whilst the difficulty of the concepts across the Economics A-level course are broadly equal, it is recognised students may struggle more in some sections and thus require more effort, thought and review. For example, certain topics might feel more digestible due to links being made with other areas of the course, which act to anchor the new knowledge in the context of another. Similarly, if a topic routinely features in the news or in daily discussion, students are likely to already hold a base understanding from which to build. In the context of this study and prior to the start of the

intervention, students were learning about tax, which students are surrounded by, both in its personal impact on their lives and in the frequency with which it is mentioned in the media and wider conversations. Whilst they are unlikely to have in-depth understanding, experience suggests that students relate easily to the broad principles of the topic. Conversely, the topics covered during the intervention, namely marginal costs, revenues and diminishing returns, are rarely mentioned outside of economics lessons. Students thus appear less able to anchor their learning of this specialist concept in the same way and, therefore, found the new theory harder to grasp initially. According to Zimmerman's (1990) model of SRL, students engage in metacognitive management strategies which place new material in the context of prior learning to assess what approach needs to be taken. Relying on such metacognitive judgements means forcing them to 'think about their thinking of their own thinking' (Dinsmore and Alexander, 2012), which is understandably hard in this situation. Students may overestimate the extent of their knowledge and miss key information. In the context of a difficult topic, it might be argued that they were less able to complete the learning with the required precision as the planning and self-assessment parameters were less clear (Roscoe *et al.*, 2013). Without clearly defined boundaries, students are likely to have been less able to regulate their learning to meet the precise knowledge, but were still able to actively pursue patterns and principles. Consequently, they could still build an argument and demonstrate a critical opinion, as assessed through an essay, but may not be able to quickly negotiate precise knowledge recall as assessed in the test (Thomas and Gadbois, 2007). This might be more obvious in the intervention topics because much of the precise knowledge is associated with diagrammatic analysis rather than written explanation.

Both the difficulty and the type of learning help to propose why the learning outcomes through assessment are not conclusive and suggest marginal positive impact overall. However, I argue that the assessment strategy that most closely examines the skills required in A-level Economics is the essay assessment and thus it gives a better account of the outcomes in this specific domain. This style of analysis and evaluation accounts for

the vast majority of marks available, and thus better predicts final outcomes on the course. In spite of the regression suggested by the test, the larger improvement achieved in the essay suggests an overall improvement in students' chances of A-level success, albeit a small positive result. The finding reiterates the need for matching the learning style with the intended outcome, in this case the final assessment style (Smith and Colby, 2007). SRL facilitated by flipped learning does not appear to improve all outcomes, but when assessing success using methods which mimic the learning objectives of the A-level exam, there does appear to be a positive correlation. These preliminary findings are interpreted in the context of student behaviour and perceptions, to explore the causes behind the trend.

2 Partial adoption of the SRL framework

Successful use of SRL was said to give students agency over their own learning by encouraging them to formulate plans and to direct and manage resources to reach their goals (Zimmerman, 2000; Pintrich, 2004). The central and explicit aim of this educational strategy is that students would learn to set goals, monitor learning and adjust their strategies accordingly (Vandevelde *et al.*, 2017). The student is at the heart of this process, playing an active role in their learning and thereby retaining ultimate freedom to resolve problems by themselves (Evans *et al.*, 2003; Vansteenkiste *et al*., 2012). A result of freedom is choice. In this study, there was no choice about participation in the flipped learning structure, but there was choice in the extent to which students adopted the core elements of the SRL framework. The data suggest that there was mixed adoption of the framework, with certain features being minimised or ignored, confirming Roscoe *et al*.'s (2013) findings. Most likely to be ignored was the self-assessment phase. Teacher observations and student feedback suggested that of the three phases of learning, most were comfortable with the planning and learning phases. Students quickly set about reading articles, watching videos and listening to podcasts to build their knowledge, supported by avid note-taking and quiet discussion with their peers. Students suggested

that they enjoyed this process, and particularly how each resource linked to the next, meeting their needs of ownership and reactive learning (O'Flaherty and Phillips, 2015).

> "The depth and quality of learning is better than in normal lessons, by a long way."
>
> *Student D*

> "In my opinion, this worked relatively well for me. I had an easier time gathering information through the prepared links, including a variety of text and visual information which provided a deep understanding of the given topic... it was quite interesting"
>
> *Student K*

> "I found myself noticing absolutely everything just because I didn't want to miss anything"
>
> *Student F*

However, the feature of the SRL framework most likely to be ignored or rushed was the self-assessment phase. The self-assessment quiz following each task sheet was intended to provide students with useful feedback about the quality and depth of learning, which they could then act on to resolve weaknesses. Whilst the primary function of this quiz was student centred, a secondary feature was that it allowed data to be collected about trends in student self-assessment. Two clear trends were evident from the data, which supported teacher observations throughout the intervention; firstly, that many students failed to appropriately review their work and, secondly, there was significant non-compliance.

2.1 Failure to review

Given that monitoring learning and adjusting strategies is seen as a core element of education, the failure to adequately review and respond appropriately is a concern. The primary assumption is that those who most successfully use SRL will look to resolve problem areas and gaps in their knowledge before attempting the self-assessment quiz again, thereby renegotiating the parameters of their knowledge and improving the learning.

The timestamp for each quiz enabled a calculation to be made to work out the time spent reviewing and improving knowledge before retaking the quiz. Excessive time gaps (>25 minutes) were discarded under the assumption that students were completing other work or had left a free period. The shorter the review time, the less possible it would be to actively learn from mistakes and thus the more unlikely it was that students were correctly using the SRL framework. In addition, data on the number of review quizzes taken was recorded. A moderate passmark was set to encourage reflection and review, but this also meant that those who did not meet this standard would have to complete as many tests as necessary to meet the bar. Those who took the test the most times were assumed to be either less effective in their self-assessment and review, or actively ignoring it. Consequently, those who had both a low review time and a high number of retakes were assumed to be those who were using the SRL framework least effectively. The data shows

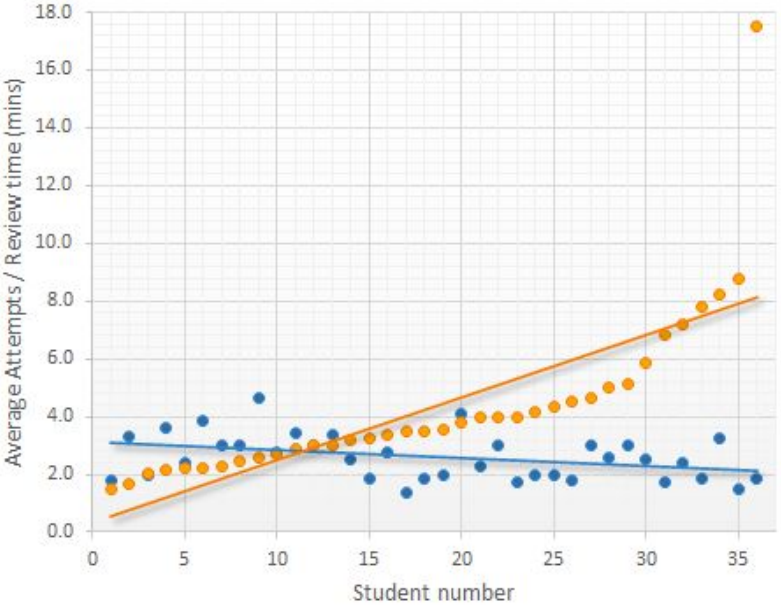


Figure 4:
Graph to show the correlation between the number of attempts and the review time between attempts in the self-assessment quiz

that there was a positive correlation between these two indicators. A Pearson's correlation was run to assess the relationship between the average number of quiz attempts and the average review time in the intervention with 36 students. There was a small positive correlation between the average number of quiz attempts and the average review time,

r(34) = 0.07. Figure 4 helps to represent this correlation, where students are sorted by the average review time.

This correlation was supported by teacher observations reporting that many were not reflecting on their performance and jumping straight onto quiz after quiz, building suspicions that these students were not learning the content in greater depth but learning to 'game the system' (Roscoe *et al.*, 2013). Teacher observations recorded that this was especially true of a small group of boys in one of the teaching sets, who turned the quizzes into a competition. One boy, Student C, was eminently prone to manipulating the system and even self-reported this in the review survey.

> "Without the teacher pushing me to achieve something, the quizzes just felt like a game to me. I did not feel any commitment to the learning, personally, as I had lost motivation to continue"
>
> *Student C*

This orientation was so obvious that others in the class became frustrated with the misuse of the SRL structure, with one student who sat on the opposite side of the class noting:

> "Get rid of the test to eliminate pointless competitiveness and cheating. The tests are what made people like [Student C] cheat and not learn any of the content."
>
> *Student A*

This student, and others to a lesser extent, reinterpreted the tasks away from a self-regulated cycle of learning towards external regulation which centred around beating the system. When treating the system as a game, students would pursue their own agenda instead of adhering to the intended goals, skills and guidance of the task sheets (Roscoe *et al*., 2013). The quiz transformed to become the extrinsic motivating force rather than a tool to support intrinsic motivation for learning. Deeper learning would have been marginalised under these extrinsic influences (Thomas *et al*., 2007) as students lose their autonomy and long-term perspective on learning. Within this renegotiated model of external regulation, the students were likely to be engaging in the less useful surface

learning (Rozendaal *et al.*, 2005). The testing data supports this claim with Student C achieving exactly the same mark in the pre- and post-test but a significant decline of 38% from the pre-intervention essay to the post-intervention essay. This represented the largest drop in the sample, where the majority saw improvement, with an average change of +13%. Earlier suggestions about the test focusing primarily on surface learning and the essay recording deeper learning appear to corroborate observations and student comments, most notably in regard to Student C. The need for intrinsic motivation is reaffirmed and reiterates that simply being in a deep learning environment, scaffolded with the tools for successful use of SRL, does not necessarily benefit students (Reason *et al.*, 2010). Whilst this was not the norm for the whole sample, as Student C represents an anomaly, the path of behaviour was still evident in others. For example, an average fall in essay outcomes of 13% was recorded from the five students who most obviously gamed the system. Student agency and freedom can, for some, cause a regression in progress.

Most interesting, however, is that the effective use of the SRL framework was not constant but evolved over time. Data and observations suggest both positive and negative changes. The positive outcomes were seen when students began with a surface-focused and externally regulated approach but realised the potential of the SRL framework and adopted it more successfully. The freedom of flipped learning gave the time and space to make such discoveries. The following extract highlights this trend with Student J, as observed by the teacher:

> *"*Student J is onto the quiz quite early...but using video captures to answer. I'm not sure he's made any notes? He's relying heavily on the learning resources so possibly hasn't actually learnt it (surface approach?)...interesting to see how many times he is forced to take the quiz to pass.
>
> ...After a couple of failed quizzes he did go back to the learning phase. Perhaps self-assessment is working*."*
>
> *Extract from teacher observation notes*

Although initially Student J was using the resources to cram knowledge to pass the test, potentially hampering long term learning (Chen and Lin, 2012), he adapted to the successful SRL structure over time. The quiz data corroborates this account as Student J took the first quiz five times before reaching the pass mark (sample average of 3), taking an average of less than a minute of review time between each quiz (sample average of 3.56 minutes). However, the number of attempts per quiz fell as the intervention progressed whilst the average review time rose, suggesting greater intentional reflection and review and thus successful use of the SRL framework. His post-intervention essay result improved by a huge 143% and the test improved by 32%. Engagement in SRL, for Student J, suggested large improvements over time in both forms of learning outcome assessment. Whilst the extreme nature of this improvement might hint at factors beyond the study parameters, supporting teacher testimony suggests that the intervention inspired and encouraged more accountability for their own learning and progress.

Conversely, some students reported a regression from self-regulation to external regulation. This finding was particularly noticeable when the first self-assessment and review did not result in significant improvements. This left the student feeling hopeless, and thus further exacerbated the regression in regulation and outcomes (Pekrun *et al.*, 2011).

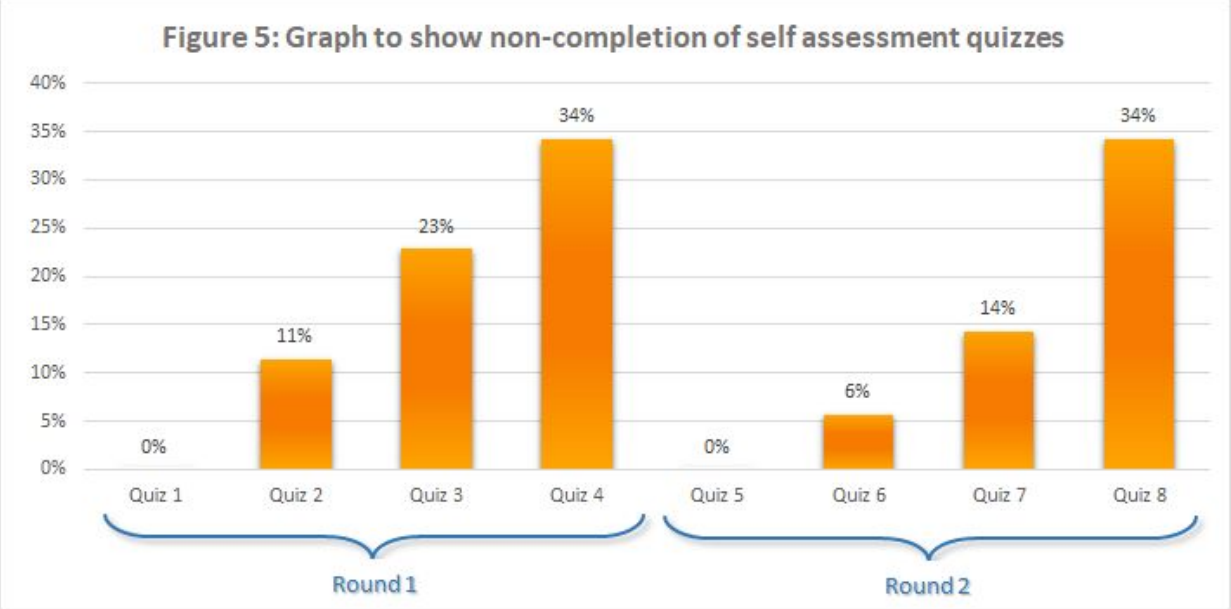
> "I think initially when I failed the test I would try and rethink it and go back and do it again. But if I failed a couple more times I would just realise that if it wasn't that answer, it must be one of the others."
>
> *Student F*

The testimony appears to suggest that, for some, SRL behaviours are inconstant and shift, based on feelings and frustrations, at least from the short-term perspective of individual task sheets. The significant influence of motivation appears obvious in this case, as repeated setbacks inspire negative motivators which shroud the learner in low confidence, thus reducing their perceived self-efficacy (Thomas and Gadbois, 2007). Whilst a full

assessment of the impacts of motivation will feature later in this discussion, it is crucial to see how motivation influences the thorough implementation of SRL strategies over time. Successful adoption of SRL is not purely determined by student choices but instead responds to an array of competing factors which might change and develop over time (Evans *et al*., 2003).

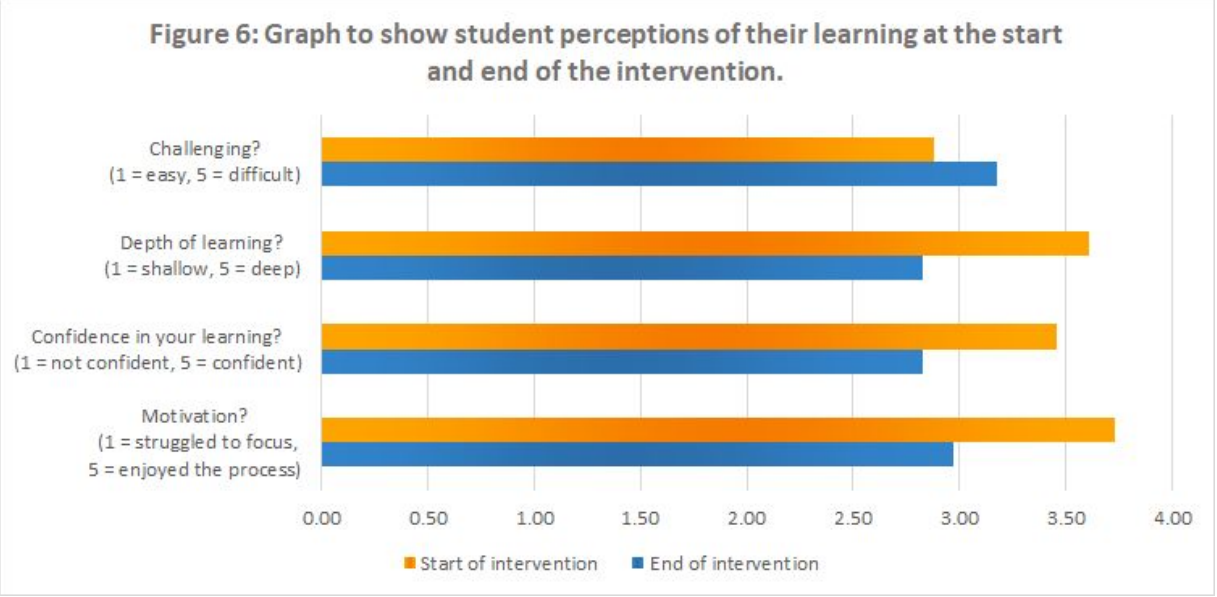
2.2 Non-compliance

He *et al.* (2016) suggest that non-compliance is an extensive problem within flipped learning given that students begin the lesson at various starting points. Whilst some would have met the learning requirements, others may have missed the work altogether and thus attend the lesson with none of the prerequisite knowledge. Within this study, non-compliance was equally troubling with a growing number of students ignoring the self-assessment quizzes as they progressed through the task sheets. Non-completion rose to 34% of participants by the end of each round of learning (figure 5). Whilst this does not



definitively show that the independent learning was not completed, earlier evidence suggests that the learning may not have been of sufficient quality for the students to feel that they were able to self-assess their learning. Student comments have already testified to corners being cut as the tasks progressed; however, evidence of growing non-compliance moves beyond 'gaming the system' to the extreme of completely ignoring

it. Whilst gaming the system reduces the value generated from the self-assessment, those who abandoned the self-assessment effectively rejected the SRL framework. Given that the self-assessment and subsequent learning review are core elements of SRL through the creation of a feedback loop (Zimmerman, 2000), progressing through the task sheet with no loop is likely to lead to diminished learning outcomes (Broadbent and Poon, 2015). In this respect, flipped learning does not appear to encourage use of SRL strategies for all students, and perhaps even discourages its use. As the intervention progressed, non-compliance rose (figure 5) whilst student perceptions surrounding the depth of their learning, confidence in their learning, and motivation all fell (figure 6). Yet again the



apparent impacts of dwindling motivation and confidence in tandem with increased cognitive load appear to reduce the use of SRL strategies, and subsequently, the positive outcomes. This assertion echoes Broadbent and Poon (2015) who suggest that flipped classrooms are not necessarily synonymous with flipped learning. Whilst worrying for the significant minority who ignored the learning process, the wider implications are multiplied by the initial struggles. Teacher observations confirm He *et al*.'s (2016) findings that the consequences of non-compliance rippled through the class in the taught sessions. Some students were clearly confident and comfortable with the topic, whereas others appeared to be baffled by questions, implying limited or confused foundational knowledge. Teacher explanations thus took longer and had to be simplified to support the needs of the least

prepared, whereas others in the class appeared to have a genuine frustration at the pace and scope of the lesson, which felt closer to revision. As a result 'neither well-prepared nor under-prepared students enjoyed the full benefits of flipped instruction' (He *et al*., 2016, p69). In spite of this, all students in the group interview agreed that the teacher-led sessions were most useful (Davies *et al.,* 2013; He *et al.,* 2016), supporting Khan's (2011) assertion of the improved 'student-to-valuable-human-time'.

> "Seeing you talk about it put it into ways that were much easier to understand. The practice meant that it took it to the next level."
>
> (Student S)

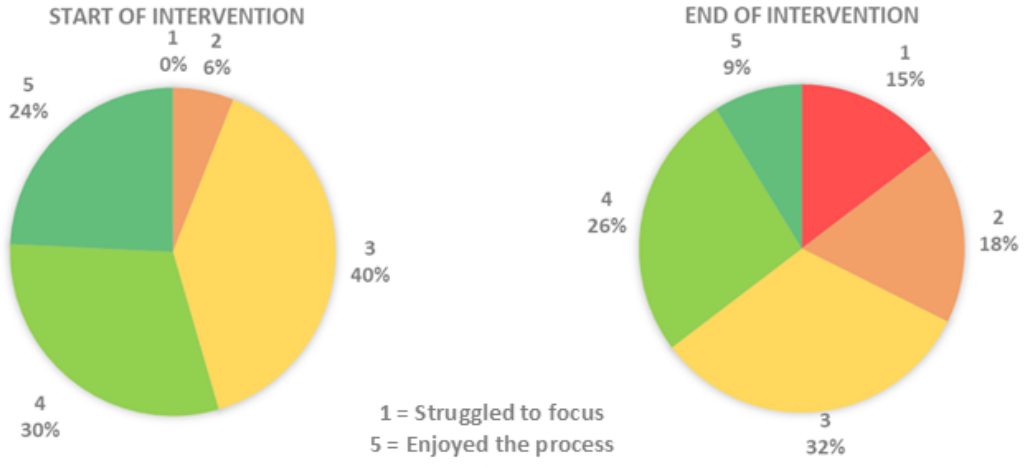
However, given the teacher observations and quiz data, the question must be asked whether lesson time could have been even more impactful had more of the class fully engaged in the independent learning. Whilst the teacher-led session would have certainly addressed knowledge gaps and enhanced synoptic links, it may not have pushed and challenged students as much as would be possible with full completion of the independent learning. Although many experienced improved recall and deeper interest (Szafir and Mutlu, 2013), this was not universally true. Given the negative trajectory of non-compliance, it is worth questioning the size of the impacts over a longer period of time.

Flipped learning appears to encourage the use of SRL (Broadbent and Poon, 2015); however, the research data (figure 5 and 6) suggests an escalation of wider problems over time, which Thomas and Gadbois (2007) link closely with motivation. Their research associates work avoidance and procrastination with lower confidence and self-handicapping, which ultimately returns to the negative motivator of a fear of failure (Martin, 2002; Thomas and Gadbois, 2007). Correspondingly, the most cited issue from students during the study was that of motivation.

3 Motivation

SRL should nurture students' basic psychological needs for autonomy, competence and relatedness (Vansteenkiste *et al.*, 2012), however in meeting these needs a great deal of effort and discipline is required from the students. Duckworth's (2017, p106) observation that 'nobody works doggedly on something they don't find intrinsically interesting' appears evident in this study. The frequency with which students mentioned motivation, in relation to their actions, attention and emotions, supports numerous research findings regarding the significance of its impact on their ability to successfully engage in SRL (Rozendaal *et al.*, 2005; Mega *et al.*, 2014; Vandevelde *et al.*, 2017). The use of SRL is thus underpinned by motivation as an essential precondition. Correspondingly, its consideration necessitates an appropriate importance and urgency. Figure 6 (p53) confirms that, on average, self-reported motivation fell over the course of the study. Although motivation remained narrowly positive throughout, the trend supports a number of research findings linking flipped learning with diminishing motivation and heightened frustration through the learning process (Davies *et al.*, 2013; He *et al.*, 2016). Figure 7 delves deeper into the shift in opinion with the majority reporting a positive outlook (24% + 30%), and no reports of a strong negative outlook (1 = 0%) in the pre-survey. However this evolved through the intervention to include a significant number of negative responses (15% + 18%) and far fewer positive responses (9% + 26%) in the post-intervention survey. A polarisation of

Figure 7: Graph to show the change in student self-reported motivation from the start to the end of the intervention



attitudes occurred as the study progressed, confirming He *et al*.'s findings (2016), but it is interesting to note the general luke-warm attitude towards flipped learning with a high proportion of neutral responses throughout. In combination with the other research methods, it was possible to contextualise this data to suggest causes of the trends, and subsequently extend the earlier assessments about learning outcomes and the partial adoption of SRL.

3.1 Intrinsic and extrinsic motivation

Intrinsic motivation was deemed to be a core element of successful learning as each student would have an internal desire for learning resulting in autonomy and action to complete tasks (Ryan and Deci, 2009; Wigfield and Cambria, 2010). Students respond not only to immediate stimuli but also to the future utility they stand to gain (Eccles *et al*., 1983). Frustrations and setbacks in the short term would not significantly alter the long term focus and thus students' goals to maintain a high standard of work would remain unchanged (Rutherford *et al.*, 2018). Whilst intrinsic motivation was true for some, as mentioned earlier when assessing the use of SRL, this diminished over time as many appeared to ignore core SRL features suggesting a short-term perspective. Wigfield *et al.* (2006) note that this trend is often particularly pronounced during this stage of life. Consequently, behaviours and attitudes began to align with those expected with extrinsic motivation. A core element of the SRL framework, the self-assessment quiz, was reinterpreted by the students away from a valuable self-monitoring tool to become a worthless and annoying external test for which the primary aim was simply to pass. Thus, the student reward mindset was distorted and the quiz appeared to encourage a move from self-review and intrinsic motivation to external control and extrinsic motivation (Smith *et al.*, 2005a). The following extract from the group interview highlights this point well:

> "[The quiz] helps with motivation because I didn't do it for the test but I can't really imagine doing it without the test. I feel like I would've skipped through the

knowledge really quickly because... there's no one checking your knowledge so I think the test did really add a lot of motivation to actually get into it."

Student K

Whilst Student K presents a mixed reaction to the quiz, highlighting some positive impacts on his learning, there is a clear understanding that the quiz became an external regulating force. Students moved from a cycle of deeper learning to a game which ultimately rewarded passive learning (Smith *et al.*, 2005a), devoid of intrinsic motivation. Whilst many of these findings were outlined earlier, the observations, surveys and interviews help to shed light on some of the causes and consequences of this transformation. For those who distorted the SRL framework, failure and uncertainty were key findings. However, those who worked within the SRL framework exhibited mastery tendencies.

3.1.1 Uncertainty and failure

The most valuable tool in interpreting the reasons behind the trends was the group interview which gave precise insights into the thoughts and feelings of the students. Many students suggested that they were not confident in constructing their learning on foundations which had not been provided directly by the teacher, craving reassurance that they were heading in the right direction.

"I needed something afterwards to reassure all of that because I had it in my head but I wasn't totally certain that what I knew was actually right, it was just all kind of theoretical."

Student W

"When you try to figure it out you don't know at the end whether you've got it right or whether you're just making it all up and drawing irrelevant links. I would like someone to guide me through what I'm learning so that I know the important parts and what's not as important."

Student Z

> "You start off and you like the understanding and then try to build on it and you just end up building on the wrong things and eventually by the end of it you've got the subject completely wrong."
>
> *Student S*

Yet again, these students were seeking external regulation and thus appeared to be extrinsically motivated. In addition to using the quiz as a game, the students maintained a dependency on the teacher to assess and affirm the direction of their learning. Rather than meeting the goal of asking questions of themselves to establish new habits for deeper learning (Smith and Colby, 2007), a self-regulated style, the students reverted back to external regulation. This craving for teacher regulation, was in spite of well-structured task sheets which supported the focus of learning, thus providing reassurance of the validity of the resources they were using. Teacher observations echoed student reports noting that some students would routinely ask for confirmation or reassurance before they had even completed the learning tasks and thus only gained part of the explanation. Whilst Vandevelde *et al*. (2017) argue that students need to be confronted with a more demanding learning environment, and corresponding uncertainty, this appeared to push some students back towards external regulation reducing the value of the learning experience. Anxiety-inducing uncertainty was found by Pekrun (2006) to significantly reduce use of self-regulated learning and metacognitive strategies as self-efficacy begins to fall. This study appears to confirm the research, but perhaps with a longer intervention period through a second phase, students would begin to adjust and grow in confidence thus reducing anxiety and improving metacognitive processes. Thus the short term emotions would shift to support self-regulated learning as students find comfort in the short-term uncertainty. The lockdown of schools due to Covid-19 meant that this additional phase of research was not possible. The short term emotions associated with learning appeared to reduce the success of SRL for some, acting as a block to its full potential. Teacher observations confirmed that those showing most signs of anxiety and uncertainty were also in the lower half of progress as assessed by the test and essay. Whilst the

negative motivators of anxiety and uncertainty played a huge role in diminishing the success of SRL, positive motivators seemed to correlate with more successful use of SRL.

3.1.2 Mastery

Mastery is understood to be a core identifier of success because it is not just about out-competing others but also striving for improved outcomes even when there is no competition, thus excelling beyond the short-term motivators to produce long-term positive

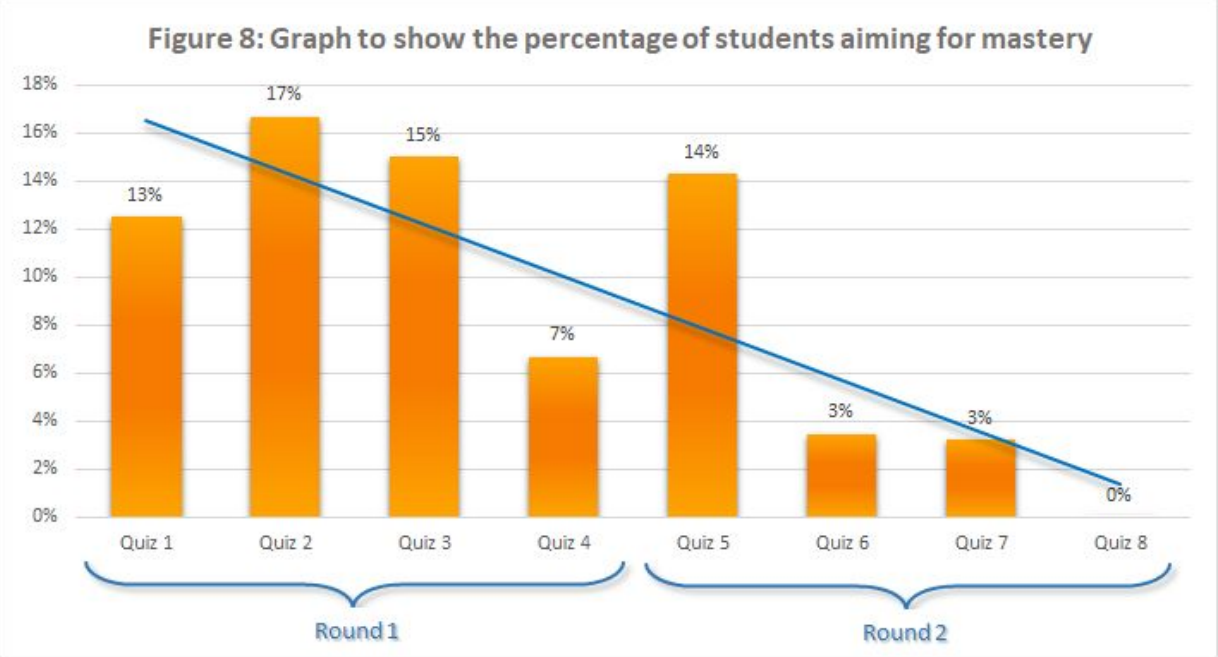


Figure 8: Graph to show the percentage of students aiming for mastery

outcomes. In this study, mastery was measured by looking at whether students opted to continue reviewing and learning after they had reached the pass mark on their self-assessment quizzes. Continuing beyond the required minimum outcome suggested an aim to achieve mastery of the topic. A small proportion of the students appeared to pursue mastery, as evidenced in figure 8. Mastery-oriented students believe that intelligence is malleable and thus self-regulate effectively, making extensive use of the feedback loop within the SRL framework (Mega *et al.*, 2014). Student Z, who exhibited mastery behaviours, explains how they resolved impasses in their learning as:

> "For me it was more about figuring out why it was wrong and then finding out the actual link or reasoning behind it."
>
> *Student Z*

This student is clearly seeking out deeper learning behind their mistakes and is not noticeably disheartened by challenges in their learning, which was confirmed by teacher observation. In this case, the freedom of flipped learning appears to promote and enable the active perseverance and resilience necessary for students to learn deeply by working back over their learning at their own pace (Davies *et al*., 2013). Consequently, those who were mastery-oriented experienced better performance than the sample average, in both the test and essay. In the essay, mastery-oriented students saw 18% improvement, 5 percentage points higher than the whole sample, and in the test they saw 1.3% improvement, 5.3 percentage points higher than the whole sample. Unlike the sample average, mastery-oriented students saw no decrease in their ability to interpret and recall precise information. Despite being agents of their own learning (Rutherford *et al.*, 2018), these students did not neglect the precise details within the concepts when seeking patterns and connections. Teacher observations support this claim, and specifically note a dedication to their work and effective organisation of their time to support in-depth knowledge acquisition.

However, there was a negative trajectory in mastery-orientation as the intervention progressed. Students' ability to regulate attention and resist impulses to give up (Rutherford *et al.*, 2018) seemed to fall in spite of their understanding of the benefits. A possible explanation is that calculations of study time are often ignored (He *et al.*, 2016) and therefore students may be more pressed for time in the final tasks of each round of learning, and subsequently manage their effort rather than pursue the optimum outcome. However, this only explains part of the trend as there is also a downward trend across the whole intervention which included two rounds of flipped learning and thus two deadlines. Whilst these students began with the stable belief of malleable intelligence (Mega *et al.*, 2014), emotions appear to also impact the mastery-oriented group. Although to a lesser extent than the whole sample, there was evidence of emotions negatively impacting their learning, most notably boredom, with a mastery-oriented student noting:

> "I became complacent as I became bored of the tasks as they were similar and it was the same method of learning repeatedly"
>
> *Student O*

Despite having the freedom to choose how they learnt new concepts, the resources were similar and thus student emotions may have slowed progress and diminished mastery behaviours. In spite of clear intrinsic motivation, assessed by teacher observations and student comments, the power of short term motivational influencers appears significant. The complexity of motivation means that deciphering its impact is not as simple as looking through the lens of the dichotomy of intrinsic and extrinsic perspectives, but recognising that there is likely to be a spectrum of results (Smith *et al.*, 2005a). Flipped learning enabled the intrinsically-motivated mastery-oriented students the opportunities to succeed, but also created an environment where negative motivators such as short term emotions could grow in their influence. Whereas much of the monitoring has been on the uptake and effective use of the structure of SRL through flipped learning, there was not enough recognition of emotions linked to the freedom of flipped learning which appeared to affect all students in a negative way over the course of the study. Thus, although motivation highlights important understandings of the outcomes of flipped learning, it also presents many other questions. Whilst the second phase of the research could have answered some of these queries, it is recognised that further research is needed to explore the topic further.

Conclusions

The study questioned the extent to which flipped learning enhanced the success of SRL strategies in A-level economics. An intervention and subsequent investigation aimed to answer the following research questions:

1. How effectively do economics students adapt to a flipped learning approach?
2. Is there evidence of improved learning outcomes from flipped learning?
3. How evident are motivation factors in student engagement and compliance?

Initially, students responded positively to flipped learning, making effective use of the SRL framework and exhibiting encouraging attitudes towards their independent work. Both student perceptions and teacher observations highlighted a dedicated and thoughtful approach, with a good willingness to self-regulate. Whilst the vast majority of students made effective use of the three phases of SRL, to set and meet their learning goals, there was a gradual decline in intensity and focus as the intervention progressed. In addition, a minority challenged the system through renegotiating the framework and principles of SRL from the beginning of the intervention, thus suggesting a poor adaptation to flipped learning. Whilst these students completed work in a flipped manner they distorted the cycle of learning to pursue their own goals outside of the learning. Consequently, although most initially adapted very easily to the flipped learning approach, the engagement of the whole sample diminished over time leading to a partial implementation of the framework. I suggest that the Hawthorne Effect was evident, as the initial novelty wore off over time, but the biggest impacts were seen due to diminishing motivation which appeared to hamper a long-term perspective of learning. Subsequently, one of the most important phases of SRL, the self-assessment phase, was neglected by many students reducing the effectiveness of the flipped learning approach.

In spite of this, research revealed evidence of improved learning outcomes (13%) when assessed in line with the skills prioritised by A-level Economics exams, notably that of critical assessment of theory and deep evaluation of principles in a real world context.

Whilst a small decline (-4%) in outcomes was seen when assessed through knowledge tests, this did not diminish the positive result as the tests rewarded skills less prioritised in the final A-level exams. A small proportion (25%) of students exhibited mastery-oriented behaviours, which are understood to be desirable in wider life-long learning and thus leading to future success. Those exhibiting mastery behaviours saw greater academic improvements (5 percentage points), whilst those who neglected the core phases of SRL achieved some of the lowest results in the sample. Observations and student feedback suggested that those who diminished the self-assessment phase were less able to appreciate the boundaries of their knowledge and thus could not possess the vital information needed to meet, adapt and improve on their learning goals. The freedom of flipped learning, necessitating student autonomy, facilitated greater success for some whilst simultaneously creating the conditions for failure for others. Whilst, on balance, the learning outcomes were positive, it must be recognised that some struggled to adapt and progress in line with the majority.

Motivation was revealed to be a fundamental determinant of successful flipped learning. As the most frequently cited topic in student feedback and observation notes, its influence was undeniable. The decision-making of the learner is crucial to successful flipped learning, however, these decisions were also highly susceptible to motivational influences. Boredom, challenge and uncertainty were frequently cited by students and explained many of the behaviours present. Whilst motivation declined for the majority of students over the course of the intervention it was most obvious for those who adopted surface strategies in the early stages, seen through gaming the system, ultimately resulting in monotony and disinterest. Motivation played a particularly pivotal role in students' effective use of self-assessment tools. Not only were students expected to revisit learning they had already covered to improve, requiring intrinsic motivation, but they were also exposed to negative motivators developing from poor quiz results, subsequently reducing their sense of self-efficacy. Not only did the self-assessment phase force students to delve into their motivational reserves to fulfill cognitively arduous repeat and review exercises, but it also

introduced the potential for negative emotional responses to poor results. Subsequently, at the most important phase of the SRL cycle, motivation was seen to be stretched, sometimes to extremes, resulting in poor or incomplete learning. The fractured cycle hampered the opportunities for improved learning outcomes.

In response to the initial research aims, I find that although there do appear to be significant benefits of flipped learning for A-level economists, particularly in encouraging higher order skills, there are also caveats to this success over greater periods of time. A longer study would have helped to research these impacts further, had schools not have closed due to COVID-19. However, the trajectory of results appears to suggest that the gains in learning outcomes would diminish over time, perhaps to the point where no improvement or even a regression in outcomes occurs over the longer term. Subsequently, I suggest that a complete adoption of flipped learning in A-level economics is not advisable, given the evidence gathered thus far, as further research is needed to attain a superior understanding of motivation and engagement over a longer period of time. Thus, I suggest that a blended approach, of flipped and traditional learning, would be more suitable to encourage the higher order skills of critical evaluation and analysis without the long-term implications of motivational decline and subsequent diminishing outcomes. A flipped approach should be implemented for short projects or units of study, but interspersed with more traditional teaching methods to maintain variety, interest and engagement. Students would still receive the benefits of independent learning skills, whilst also experiencing greater autonomy, but will not have to maintain motivation for such extended periods of time. Building the frequency and duration of such projects would support students' capacity for managing motivational influences.

This study prioritised direction with a narrow focus to reach greater depth of analysis, tailoring to economics teachers and school leaders. In spite of this intent, the valuable insights gained about the challenges of long-term implementation could add much weight to this broad field of research, to support and challenge current understandings. Three key areas would benefit most from further research beyond this study. Firstly, given the direct

focus on the student, and specifically learning outcomes, more research will be needed in assessing the impacts on the teacher. Teachers are key facilitators of this model of learning and thus an assessment on workload will be necessary in this notoriously time-poor profession. Equally, teacher training might need to adapt to respond to growing use of flipped learning. Perhaps, with the accelerated technological expansion in response to the Covid-19 pandemic, the learning curve may have flattened for teachers and thus flipped learning uptake might be easier. Further research in the near future will help assess this claim. Secondly, this study is focused on one school in an affluent area, and therefore the socio-economic status of students undoubtedly plays a significant role. For example, the expectation for students to make use of online resources and study from home necessitates easy access to reliable internet connections, suitable devices and practical working conditions. Given the reliance on internet-based resources and videos for modern flipped learning, insufficient internet access would have a huge effect. Those without access would necessarily see a much higher proportion of non-compliance, thus diminishing the impact of the teaching sessions and learning outcomes. This would be multiplied for those without stable home lives, where distraction may be commonplace. A larger scale study, including schools in a variety of locations, is essential to properly assess the impact of socio-economic background on the benefits of flipped learning. Finally, further research will be needed on the impact of the other subjects studied by the students. Given that most students will study three A-level subjects, it follows that the teaching style employed by their other teachers will also impact students' comfort and willingness to become more autonomous in their learning. In comparing lessons, students may feel as though one subject is not providing the same experience as others and thus more vigorously oppose the system, in spite of the suggested benefits. Thus, to extend this study further it would be helpful to see how a whole school or whole 6th form adoption of flipped learning would impact results, as each student becomes ingrained in the process rather than seeing it as unusual. A whole school approach could mitigate the feelings of

disparity and thus maintain interest, resilience and self-efficacy given that flipped learning becomes the new normal.

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Appendices

Appendix 1: Sample task sheet.

Returns to scale and Economies of Scale

Learning aims

1. To define and explain returns to scale, including decreasing, constant and increasing
2. To explain economies of scale and the relationship with the LRAC curve
3. To differentiate between the different types of economies of scale

Learning resources

Work through the following learning resources to build your knowledge and understanding. The focus is on your self reflection of your own learning. If you are confident then move through at a faster pace, but if you need more time then take it.



1. Read this explanation of returns to scale. Make sure you understand decreasing, constant and increasing returns to scale, and ensure you know the difference between it and diminishing marginal returns.
2. Read this summary of Economies of Scale. Make sure you understand the link to the LRAC curve
3. Watch the first 7 minutes of this video looking at the types of economies of scale. You need to know the difference between internal and external economies as well as the subdivisions.
4. Read this summary of the types of economies of scale.

Make notes and ensure you fully understand the topic.

Review and Reflect

Do you understand the following points in enough depth and clarity that you could explain them to a friend?



I can:

- ❑ Explain the difference between diminishing marginal returns and returns to scale
- ❑ Differentiate between decreasing, constant and increasing returns to scale
- ❑ Define economies of scale
- ❑ Summarise how economies of scale is shown on a LRAC curve diagram.
- ❑ Explain how internal and external economies of scale differ
- ❑ Give examples, and explain, different types of economies of scale.

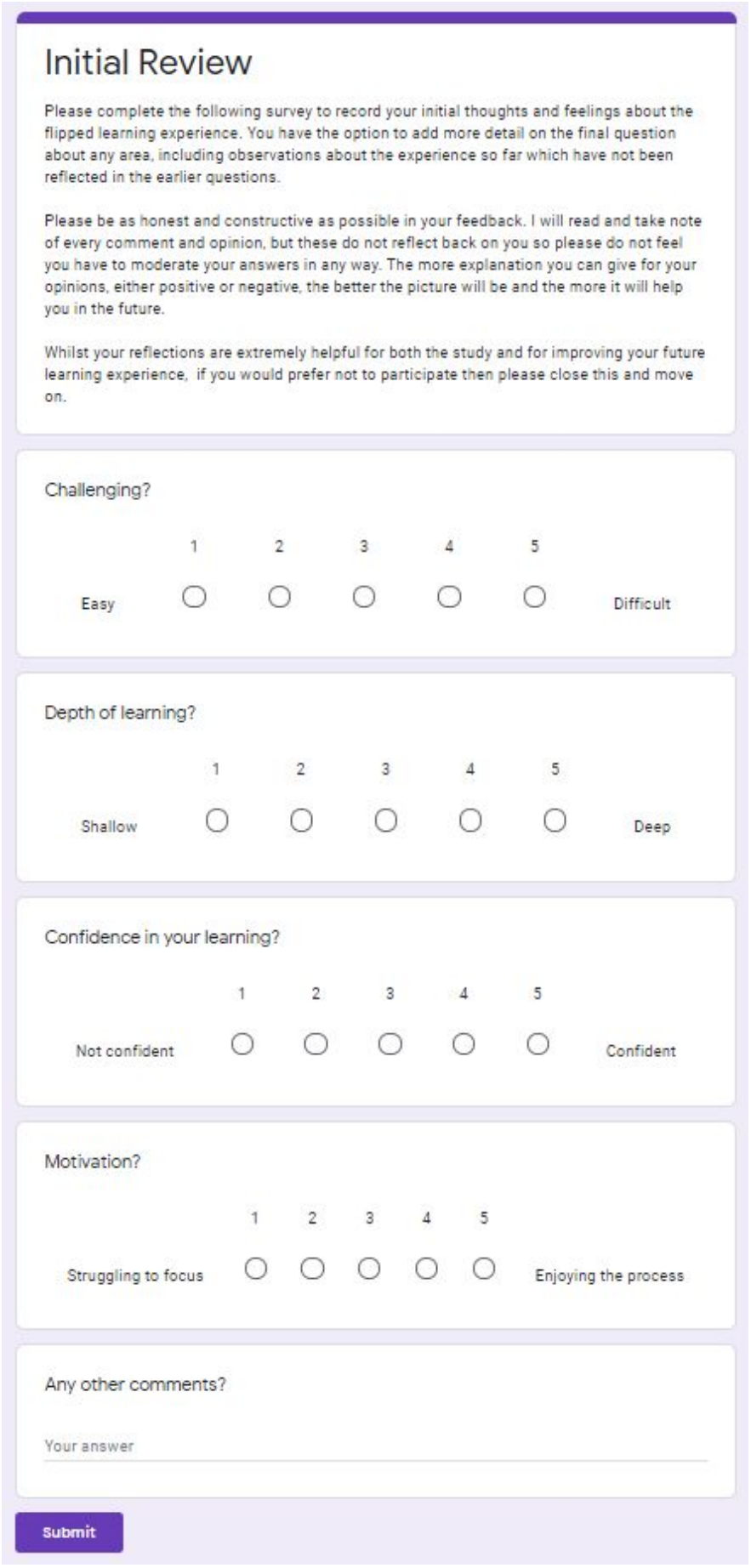
Self Assess

When you are certain you understand and can explain the points above to a friend, take the quiz. You need to achieve 100% to access the link to progress to the next task.



Quiz

Appendix 2: Initial Survey



Initial Review

Please complete the following survey to record your initial thoughts and feelings about the flipped learning experience. You have the option to add more detail on the final question about any area, including observations about the experience so far which have not been reflected in the earlier questions.

Please be as honest and constructive as possible in your feedback. I will read and take note of every comment and opinion, but these do not reflect back on you so please do not feel you have to moderate your answers in any way. The more explanation you can give for your opinions, either positive or negative, the better the picture will be and the more it will help you in the future.

Whilst your reflections are extremely helpful for both the study and for improving your future learning experience, if you would prefer not to participate then please close this and move on.

Challenging?

	1	2	3	4	5	
Easy	○	○	○	○	○	Difficult

Depth of learning?

	1	2	3	4	5	
Shallow	○	○	○	○	○	Deep

Confidence in your learning?

	1	2	3	4	5	
Not confident	○	○	○	○	○	Confident

Motivation?

	1	2	3	4	5	
Struggling to focus	○	○	○	○	○	Enjoying the process

Any other comments?

Your answer

Submit

Appendix 3: Group interview questions

14th March 2020

Group interview - Masters in Learning and Teaching

Explain that there is no correct answer and that all opinions, positive and negative, are just as useful. Explain that an audio recording will be used, stored on a school device and deleted after use. No one else will have access to it, and all names will be anonymised so anything you say will not link back to you.

Participants are encouraged to share and explain themselves. Agreeing and disagreeing with others is useful.

Interview should take around 20 minutes.

Outline questions *(adapt and change if needed, following the lead of the students)*

1. How did you find the flipped learning experience?
2. How did you find the flipped learning experience?
3. Which half of the flip did you find most useful/helpful?
4. Did you find it harder or easier than the normal way of learning?
5. How would you rate your learning overall (depth, breadth, quality)?
6. Do you think it helped with your independence?
7. How much time did you spend out of lessons on your work (in comparison to normal lessons)?
8. How did motivation impact you?
9. Self assessment - Did you do it and how did it help?
10. How would you change this style of learning if you could?
11. Any other comments?