Engaging Teachers in Research: Learning Research Groups as CPD

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A Research & Development Project

Submitted for the MSc in Learning & Teaching 2022

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ABSTRACT

This project aimed to investigate how engaging teachers in research through learning research groups (LRGs) can serve as a viable form of continued professional development (CPD). Teachers signed up to one of four LRGs and throughout the year shared articles pertaining to a specific topic. Participants then undertook their own practitioner research, completed an article for inhouse publication and presented their findings to governors in a poster conference. Three research questions were posed, 1) Does engaging in research through LRGs improve practice? 2) Is engaging in research through LRGs a useful form of CPD? 3) What is the school leadership's perception of an LRG approach to CPD becoming a whole school practice? A mixed methods approach was taken, involving questionnaires and interviews. Findings indicate that 1) participation in the LRG has improved the practice of those involved. 2) Engagement in the LRG has met the criteria for good CPD outlined in the literature review, and 3) the leadership of Riverside College see the LRG as having value as a sign, benefits outweighing its costs and would support its expansion. It is concluded that the LRG is a valuable way to engage teachers in research for CPD and that this approach contributes, when considered in the context of similar case studies, to our understanding of the key features and benefits of research engagement as CPD.

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INTRODUCTION

This project arose following my appointment as Assistant Headmaster with responsibility for teaching and learning at Riverside College (pseudonym). This gave me the scope to make wider reaching interventions, and my hope was to innovate the way Riverside College encouraged research engagement and continued professional development (CPD). To this end, I introduced a learning research group (LRG). Prior to the LRG, the college's approach to a teaching and learning group was an informal 'drop in' during lunchtimes or after school. These meetings involved discussing literature, usually from the Education Endowment Foundation (EEF), and how it might apply to our context. Teachers were encouraged to discuss their views but there was no expectation this would be formally implemented. Attendance was ad hoc and inconsistent.

The LRG was conceived in collaboration with the deputy head academic and group leads to formalise the teaching and learning group outlined above. The aim was to foster a sustained approach to research engaged CPD, and to improve practice by conducting practitioner research and contributing to a research journal that would be shared with staff and governors, with the long-term goal of improving pupil outcomes. One motivating factor for this, is that Riverside College is a nonselective independent secondary school, with a broad range of abilities, at the time of writing, around seventy percent of pupils have a special educational need, and it is therefore perceived as beneficial that teachers can engage with research to better accommodate our pupils' needs.

It is customary to introduce research engagement projects, like this one, by referencing the 'boom' in educational research, and evidence informed practice (EIP) both in UK schools and internationally; indeed, it seems 'a *global push exists to bolster the connections between research and practice in education'* (Malin et al, 2020 p1). That there is a common introduction, highlights the '*recent shifts in the wider educational landscape such as the growing desire for education practices to be evidence-informed, and for teachers to engage with and in research.'* (Guilfoyle, 2020 p46).

Though the availability of research has increased in the last decade (British Educational Research Association, [BERA] 2014), discussion regarding the application of research stretches as far back as Dewey (1900). Though often cited as opening the doors to research, Dewey (1938) was sceptical about applying laboratory research to different contexts, an argument still held today (Cain, 2019). A proponent of research engagement in teaching was Laurence Stenhouse (1971,1975,1979, 1981) who argued *'...educational practice can be improved if teachers are actively engaged in the joint investigation of problems relating to students' learning…'* (Tinsley 2021 p1). It is Stenhouse's legacy that teacher or practitioner research, and EIP gained traction, stimulating investment in teacher training, DfE Best Practice Scholarships, the National College Research Awards and secured government funding for research and development schools (Cordingley, 2013). More recently, Goldacre (2013) called for education to become research informed:

> "*By collecting better evidence about what works best and establishing a culture where this evidence is used as a matter of routine, we can improve outcomes for children and increase professional development."*
>
> *-Goldacre (2013) p34*

This rallying cry is seen as one of the pressures which led to greater investment in the Educational Endowment Foundation (EEF) and put pressure on schools to engage with research through public policy (Cain, 2019; Timperley et al, 2007; Coldwell et al, 2017; Guilfoyle 2020). However, Goldacre focusses on randomised control trials (RCTs), rather than practitioner and action research; though both constitute research engagement, there is debate about the value and appropriateness of both approaches (Goldacre, 2013; Thomas, 2020).

The application of educational research is diverse, (Coldwell et al, 2017) but the goal of professional development, improving practice, and routing out ineffective practices is consistent (Rousseau and Gunia, 2016). One application of EIP is as a vehicle for self-improving schools (Hargreaves, 2010; Brown and Zhang, 2016; Godfrey, 2016). There is also the added benefit

that research engagement acts as CPD contributing to improved teaching and pupil outcomes (Worth and Van Den Brande, 2020; Cordingley et al, 2015; BERA, 2014), which are long-term goals of research engagement (Cain 2019).

The picture painted above suggests that UK schools are becoming increasingly research engaged, and this is true if the sales of research-based education books, and the growth of ResearchEd are a measure of engagement (Hattie, 2008). Moreover, use of the EEF toolkit has grown from 11% to 59% in school leaders, and 4% to 32% for classroom teachers from 2012-2018, suggesting a growing research-oriented climate (EEF, 2018). However, this is not the experience of many teachers who perceive that there is still a large gap between research and practice; leading to sporadic engagement with research (Coldwell et al, 2017; Graves and Moore, 2017; Whitty and Whisby, 2017). In a survey of teacher attitudes to EIP by the National Foundation for Educational Research (NFER), research was the basis for only 7% of teachers' decisions (Walker et al, 2019) compared to 60% for experience. Experience is valuable but can lead to practices based on intuition and tradition, even if they have detrimental effects (Weinstein and Sumeracki, 2018). This resistance to EIP is despite a body of evidence demonstrating its benefits (Cordingley et al, 2015; BERA, 2014; Berliner, 2020).

This scepticism is something I have experienced. As a psychology teacher, I am interested in applying research to human behaviour, and viewed with condescension educational research, which in my view, had come from a less empirical tradition. However, I tried to apply my knowledge of psychology to improve teaching, focussing on techniques with psychological overlap such as findings by Dunlosky et al (2013). Through the Masters in Learning and Teaching (MLT) at the University of Oxford I have come to appreciate the challenges of the school context and the balanced approach of EIP and practitioner research. In my role as Assistant Headmaster, I aim to similarly develop teachers' practice through engaging them in research in a Stenhousian approach: *that to engage with research we need to engage in research'* (Cordingley, 2013, p237).

LITERATURE REVIEW

Having introduced the history and growth of educational research, this review will outline discussion points regarding EIP in CPD, including relative costs and benefits, the qualities of good CPD, and models of teacher research projects. The review will be divided as follows:

1. Terminology- Based or informed? In or with?
2. The benefits of research engagement
3. Barriers to and challenges of research engagement
4. CPD and models of research engagement

1. Terminology: Based or informed? In or with?

There is contention regarding the extent to which research can be applied to the school context (McIntyre, 2005; Goldacre, 2013; Nelson and O'Beirne, 2014) which has given rise to a precise vocabulary regarding research use. One debate regards whether education should be evidence *based* or *informed* (Kirshner and Suma, 2020; Rogers, 2020; Cain, 2015). There is discussion too regarding what should be considered as evidence (Coldwell et al, 2017) and whether teachers should be engaging *with* or *in* research (Cordingley, 2013; BERA, 2014; Tinsley, 2021), these semantic differences may seem trivial, but are important.

Evidence based or informed

Evidence based practice (EBP) is well established in medicine and law, and it is argued that a similar model could be applied to education (Rousseau & Gunia, 2020; Neelen & Kirschner, 2020; Stafaninni and Griffith, 2020) or as Goldacre (2013) argues, if we expect Drs to make decisions based on research, why can this not be true of teaching? EBP is defined as a

systematic approach to decision making and actions, with the goal of increasing desired outcomes and discontinuing ineffective practices (Rousseau and Gunia, 2016). Applied to education, this would involve keeping abreast of research and standardising teaching practice to be based on the most recent empirical findings.

There are arguments however, that education cannot achieve the utopia of EBP (Coldwell et al, 2017), but some educational research is seen as offering a research-based approach, particularly findings from cognitive psychology (Rousseau and Gunia, 2016; Dunlosky et al, 2013). However, unlike psychology education has conflicting goals and fragmented systems, confounding the ability of research to unify practice (Labaree, 1997). This complex relationship between research and practice is explored by Coldwell et al (2017) for the DfE, discussing how the brokerage of research is changing from a unidirectional model of researcher to practitioner, to an approach where research developed in professional contexts feeds back into research institutions. This may be seen as having more in common with evidence-*informed* practice (EIP) which would allow adaption of research findings to the varying contexts of schools (Roediger and Karpicke, 2006).

There is a call for greater clarity between EBP and EIP (Coldwell et al, 2017), indeed in some publications they are used interchangeably. EIP is defined by Walker (2017) as the process of teachers finding, evaluating, and applying the findings of research to improve their teaching. Coldwell et al (2017) suggest that EIP involves formal evidence produced by researchers, practitioner enquiry, and routinely selected school data. This differentiates EIP from EBP, by considering the context of the evidence, and involving enquiry from those using it. Cain (2019) suggests research insights alone are insufficient and argues in EIP, research is one part of the jigsaw, one that should be considered alongside context and experience.

EIP may be regarded as the ideal compromise, with Rogers (2020) arguing that though research offers much, it is noisy and lacks cohesion. Therefore, using research selectively to inform practice is more pragmatic than basing practice on research. Therefore, I will take an EIP

approach to engage teachers in research for its benefits to CPD (Worth and Van Den Brande, 2020).

Engaging in or with research?

Few teachers are aware of the difference between engaging *with* and engaging *in* research (Leat et al, 2014; Coldwell et al, 2017). Engaging *with* research involves using literature to inform practice, whereas engaging *in* research involves the teacher as researcher (Bell et al, 2010). There is natural overlap; it is likely that engaging with research involves reporting on its application, but this is not necessary. Likewise, engaging *in* research is usually based on existing research (Bell et al, 2010; Tinsley, 2021; Burn et al, 2021).

There is growing desire for teachers to have research capacity as part of their CPD (Cordingley, 2013; Dimmock, 2014; McIntyre, 2005) which involves teachers in research processes rather than just talking about research (Dimmock, 2014). Seemingly, teachers are more engaged with research when it is seen as a process rather than a body of evidence (BERA, 2014) which led to recommendations by the DfE that EIP should be commonplace and involve teacher inquiry (Coldwell et al, 2017)

Research engagement, *in* or *with*, can yield positive results when applied systematically to CPD (Bell et al, 2010). Bell outlines three types of research based CPD: researcher led large academic studies, teacher-initiated practitioner research, and masters-based research within a program for developing research skills. All are linked with improvements in practice and outcomes. Similarly, Cordingley et al (2015) outlines CPD as being either teacher, or researcher led, and engaging with or in research. Regardless of the variant, all yielded positive pupil results and increased teachers' confidence and willingness to engage in experimentation.

2. The Benefits of Research Engagement

One might think that as the DfE (2016) states all CPD should be underpinned by robust evidence, that there is definitive value in research engagement. Indeed, there have been lofty statements made about the benefits of EIP; BERA (2014) describe research informed schools as being the hallmark of high performing education systems, and the DfE (2016) describe effective schools as having research built into every level of decision making, suggesting research can lead to school improvement, echoed in much of the literature (Hoyle, 2008; Evans, 2008; Menter and Clarke, 2016; Brown, 2018; Opfer and Pedder, 2010; Schon, 1983)

School improvement is a broad concept, with a broad range of measures. It is therefore useful to identify specific domains against which to judge EIP. One attempt to do this is presented by Cain (2019). Cain argues that the goals of research engagement are to improve a) Pupil outcomes, in a broad sense, including academic and pastoral, and b) teacher professionalism, including a greater respect for the profession. Both goals are long term and worked toward through the intermediate goals of 1) Improving decision making, 2) widening teacher mindsets, and 3) creating intelligent communities. These features are outlined in depth by Cain (2019) and create a clear series of benefits of research engagement, which contribute to the themes against which my intervention can be evaluated.

Pupil Outcomes

Research engagement has the dual benefit of being both CPD and a way of improving pupil outcomes (Cain, 2019). Pupil outcomes, as in most educational interventions, are seen as one of the potential benefits of EIP and there are several studies which attest to its success. In international comparisons, BERA (2014) found that highly successful nations such as Singapore and Finland are highly research engaged, and in a review of evidence informed CPD, Cordingley (2013) found all research models led to improved pupil attainment. Pupil benefits of

research engaged CPD stretch beyond attainment, with pupils showing, improved behaviour, attitude to study, organisation, collaboration, and selection of learning strategies following their teacher's involvement with research informed CPD (Cordingly et al, 2015).

The link between research processes and pupil outcomes may be owed to the relationship between research engagement and quality teaching, with pupils as the beneficiaries (BERA, 2014). The correlation between teaching and pupil outcomes is well established, and quality teaching is seen as the most important in-school factor to pupil outcomes (BERA, 2014; Hanushek and Rivkin, 2012; Burgess, 2015; Chedzey et al, 2021). Early Career Teachers' (ECTs) experience of research informed CPD is particularly related to pupil outcomes, highlighting the importance of research engagement throughout a teacher's career (Ingersoll, 2001; Ashby et al, 2008; Hattie, 2009; Desimone and Hill, 2017; Coldwell et al, 2017).

However, there are other factors which could contribute to improved outcomes beyond research alone (Cain, 2019). There is a naivety to the linear explanation that research engagement, improves practice and therefore pupils' outcomes, and Coldwell et al (2017) describes the role of *'research as necessary but not sufficient' (p13)* in explaining improved pupil outcomes. Indeed, it is challenging, if not impossible, to show research engagement directly affects pupil outcomes, with few studies showing a clear link (Brown et al, 2021) leading Coldwell et al (2017) to summarise that there are few studies showing improved teaching, fewer on improved pupil outcomes, and that knowledge of the links between research and outcomes is lacking.

Despite these criticisms, it seems clear, that though not a silver bullet, research can contribute to our understanding of what works (Goldacre, 2013; Slavin, 2004) and is better than the alternatives of guesswork, habit, or bias (Cain, 2019). However, Coldwell et al (2017) does accurately point out that we do need greater understanding of the link between research and outcomes. The features of decision-making, teacher mindsets and intelligent communities (Cain, 2019) may contribute to this understanding.

Teacher Professionalism

Teacher professionalism is one long-term goal of research engagement (Cain, 2019). For some, teaching has not the profile, prestige or organisational structures associated with other professions, and has been open to *'lay views of education and reform, as well as to inherited patterns of practice'* (Cohen and Mehta, 2017 p7). An expectation of research engagement as is common in Medicine (Goldacre, 2013) is seen as a way of raising this status, and institutions including the National College of Teaching and the Chartered College of Teaching (CCT) have been designed to serve this purpose (Cain, 2019).

Such is the growing evidence that EIP benefits teacher outcomes in terms of pedagogical knowledge, skills, improved confidence and job satisfaction (Brown, 2018; Bell et al, 2010; Firth, 2016) that Coldwell et al (2017) in a report for the DfE state that that it is clearly desirable that models of research engagement are implemented, to improve the professionalism and expertise of teachers, and BERA (2014) believe all teachers should be research literate and have opportunities to engage in research to become informed professionals. *How* this is achieved through research is not direct, but through the features described below.

Decision making

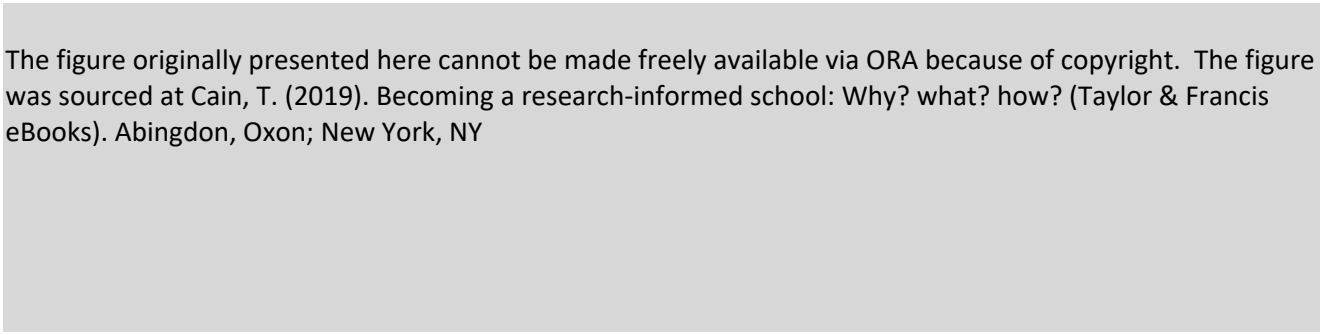
In the DfE review of evidence informed practice, Coldwell et al (2017) describe research use to inform decisions as desirable, the UK Government states that good decision making should be supported by the best possible evidence, and (Cain, 2019) and Burn et al (2021) argue research should be used at all levels of decision making in schools. Using evidence to inform practice has also become simpler and more accessible, with increased funding and intention from the DfE (Campbell and Stott, 2008). The improved climate for research engagement is described by Sir Kevan Collins of the EEF:

There is no doubt that schools today are in a better position to judge what will work in their classrooms than they were ten years ago. We have access to more robust evidence about which teaching and learning strategies are likely to be effective, and as the evidence base has grown, so too have teachers' appetite for it.

-Sir Kevan Collins (EEF, 2019), p2

A key argument for research use in decision-making, is in comparison to alternatives. Experience accounts for 60% of teachers' decisions (Walker, 2019), however, experience is fallible and relying on experience alone can lead to *a* comfortable stasis where one fails to question one's beliefs (Cain, 2019). Though Cain (2019) concedes that research is not a *'golden bullet' (Cain 2019, p9)* they maintain that it is a key component in decision making, and that it is better than trial and error.

The decision-making process is explored by Cain (2019), starting with a simple *evidence informs decision making* statement. This seems a rational approach to decision-making, however information alone cannot tell us what to do (Hammersley, 2013; Honig and Coburn, 2008) and needs to be interpreted, critically analysed, and filtered through social contexts, values, and external pressures, in what is described as optimal rationality by Brown (2018). This process is summarised by Cain (2019) in the table below.



-Cain (2019)

This process is described as slow thinking (Kahneman, 2011) which is not instinctual but involves conscious and sustained effort to explore problems and generate solutions. This contrasts with fast thinking, which is akin to decisions seen in the classroom, responding to immediate problems in a short timeframe based on experience and context.

Teacher mindsets

Teacher mindset refers to the beliefs, behaviours and routines of teachers established through practise (Cain, 2019). Teacher mindset is formed through reciprocal environmental and cognitive factors and may be explained in the 'onion model' (Korthagen and Vasalos, 2005) in *Figure 1.*

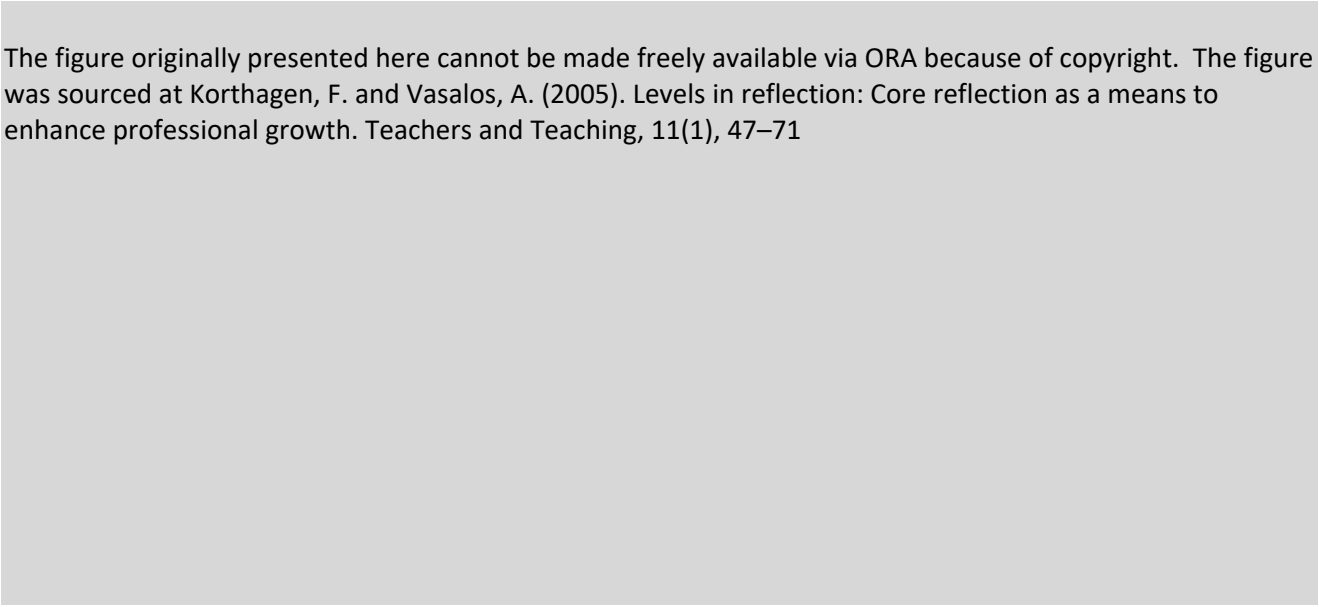


Figure 1. Onion Model of teacher Mindset- Korthagen and Vasalos, (2005)

In the context of research engagement, research could be an environmental factor, and its ability to change the mindset of teachers would depend on its integration with the layers of the onion. For example, research about school uniform might logically be disregarded as having no benefit, however teachers' beliefs about uniform from experience, and traditions they

identify with may affect both the teacher's behaviour and the decisions they collectively make. It is theorised that critical research engagement, and slow thinking processes can broaden teacher mindsets by challenging pre-conceived myths about teaching and encourage reflection (Dewy, 1933, Cain, 2019). Indeed, challenging teachers' conceptions is seen as beneficial and important (Hargreaves, 1995; Calderhead ,1989; Thrupp, 2005).

Though teacher mindset can feed into the slow thinking decision-making process, this may not obviously apply to the fast decisions needed in classroom (Schon 1983;1987). Fast thinking (Kahneman, 2011) or as Schon (1983) puts it, reflection in action, involves the countless decision teachers make in lessons and may be considered the central skill in teaching (Shavelson, 1973). Teacher mindset is important in fast thinking, particularly the feature of meta-processes (Eraut, 2004); a collection of heuristics and cognitive biases which help us reach conclusions and make decisions employed in fast thinking. These processes tend to produce reasonably accurate predictions and solutions, but are resistant to change, even when counterproductive, and subject to confirmation bias (Shavelson, 1983; Calderhead, 1984; Duschl and Gitomer ,1997). A role of research engagement then, is to change teacher mindsets by challenging the meta-processes that underpin them (Cain, 2019). If this can be done in such a way that it improves practice, then the long-term goal of increasing pupil outcomes may be met.

Creating intelligent communities

The third intermediate goal of EIP is to create intelligent communities (Cain, 2019), linking to the idea of school culture. Culture has a reciprocal relationship with research engagement; research-oriented cultures can create the conditions to encourage or discourage research engagement and be changed by such engagement. Research-oriented cultures are therefore seen as desirable (Byrne ,2021) with BERA (2014) recommending school leaders should promote research engagement and provide teachers with research rich environments.

Intelligent communities imply intellectual activity, and schools that can be defined this way share features, including clear aims, policies, tools, and organisational structures (Cain, 2019). These features go beyond individuals and are owned by the collective culture of the school, as Davis and Sumara (2008) argue, schools can be seen to have an agency of their own that survives changes in leadership. To become an intelligent community, schools should be able to establish a shared vision, collective responsibility, reflective enquiry, collaboration, group and individual learning, inclusivity, and openness (Stoll et al, 2006). Intelligent communities imply a shared vision, structure, and promote collaboration and discussion, and schools that can provide these communities have more effective teachers and improved pupil outcomes (Stoll et al, 2006) and this should be an aspiration for schools (Byrne, 2021).

Intelligent communities seem idealistic, but research can be a vehicle for their creation. Central to intelligent communities is collaboration. Research provides a stimulus on which to base the discussions and collaboration necessary to maintain intelligent communities (Stoll et al, 2006). These discussions enable teachers to think together (Cain, 2019) and develop understanding of research which enable teachers to challenge their mindsets (Cain, 2015). This collaboration is only possible however, if schools value research and change, provide opportunities to discuss teaching and learning, and have strong organisational trust (Brown and Zhang, 2016). Teachers see this as important in their CPD, with Bell et al (2010) finding teachers most valued practitioner research and collaboration in CPD.

The relationship between collaboration and research engagement is not always straightforward, and teacher engagement with research is usually individual rather than cooperative: working together but not to the same ends, or collaborative: working together towards a shared goal (Van Gasse et al, 2017). Individual research is beneficial, but not as strongly as cooperative and/or collaborative approaches. Schools should therefore promote collaboration (OECD, 2019; Hofman et al, 2001; Robinson et al, 2017) whilst also maintaining individual engagement (Stoll et al, 2006).

3. Barriers to and challenges of engaging in research

The benefits of research engagement will not guarantee EIP. Barriers to research engagement for CPD or otherwise include but are not exclusive to: time, workload, accessibility, misconception, and misunderstanding (Cain, 2019; Brown and Flood, 2019; Brown et al, 2021; BERA 2014. Arthur et al 2004; Hopkins 2007; Christie et al, 2008; Mitchel, 2013; Wiggins, 2015).

How these barriers may be pitted against the benefits was considered by Brown et al (2021), drawing on the sociological work of Baudrillard (1968). This lens sees any consumer product, in this context educational research, as having three features: benefits, and whether these are greater or lesser than alternatives, costs, and whether these or greater or lesser than alternatives, and value as a sign. Where costs and benefits have explicit meaning, value as a sign refers to the internal and external prestige of the product, and what that conveys about the possessor. Therefore, when evaluating the costs of research engagement, it is in comparisons to benefits and value as a sign; if the benefits of research outweigh the costs, compare favourably against alternatives, and the school sees research engagement as desirable; research use may be implemented.

Availability and Accessibility

Despite considerable improvements to the availability of research (EEF, 2016; Coldwell et al, 2017) the long-maligned accessibility of research is still a barrier to research implementation (Williams and Coles, 2003; Goldacre, 2013; McIntyre, 2005). This may be because of paywalls, and or a lack of facilities digital or otherwise (Valente, 1996; Biesta, 2007). Arguably this has largely been overcome with the landscape changing rapidly even in the last two years (Cain, 2019) particularly with the continued development of digital technologies (Coldwell et al, 2017). Additionally, Institutions such as the EEF provide the free teacher toolkit research

summaries, and the CCT provides free access to its own journal, and significant discounts on BERA memberships among others, further facilitating access.

Accessibility is not simply gaining access to research however, and the dense academic style of the research is seen as inaccessible and incomprehensible to the novice reader (Cordingley et al, 2015; Berliner 2020), This is seen as one of the psychological barriers to research engagement in the form of practitioner ability (Rousseau and Gunia, 2016), which can impact motivation. This too can be overcome, with the EEF toolkit and its reader friendly style, and the shorter articles from the CCT Impact journal acting as starting points. In a more proactive approach, Berliner (2020) as a researcher decodes dense sections with laymen's summaries, in this way providing teachers with more understanding when encountering similar articles in the future.

The accessibility of research may compound the problem of misunderstanding and misapplying research. If a finding is oversimplified or misunderstood then important nuances may be lost in translation, this can occur if there is a rush to convert research into strategies instead of understanding the spirit of the research (Marshall and Drummond, 2006) leading to worthwhile interventions being abandoned as ineffective, labelled as a myth (Cain 2019, Mintrop and Zumpe, 2019) or perhaps worse applied to the detriment of pupils and schools (Walker, 2017; McIntyre, 2005).

Scepticism and research quality

One of the conditions for establishing a research culture is buy-in from stakeholders (Brown et al, 2018), a lack of which can be attributed to staffroom cynicism (Mutton et al, 2008). Scepticism not only extends to research itself, but also the claim that something is evidence based (Dagenais et al, 2012; Nicholson-Goodman and Garman, 2007).

Institutions can reject evidence when it challenges the flow of organisational structures (Ulrich, 2012) or when a more sophisticated form of the institutions' primary activity is introduced, as it can be seen as a threat to stability (Engstrom, 2015). At a teacher level, Cain (2017) in a review of teacher's attitudes to research, found three main reasons for scepticism: well-reasoned objections, questions relating to generalisability, and tensions between teacher values and research findings.

Well-reasoned objections were often linked to research literacy (Cain, 2019), concerning contradictions between papers, recency of research and methodology. These could be overcome with a research champion being able to articulate the nature of the research process, the difference between stable and contextual phenomena, and exploring the differing goals of teachers and researchers (Burn et al, 2021; McIntyre, 2005). However, the objections also call into question teachers' attitudes to the quality of educational research.

Educational research has been described as: *'Irrelevant to practice... uncoordinated without any preceding or follow up research.... [which] virtually nobody reads"* (Hargreaves 1996, in Cain 2019 p7). Though Cain (2019) argues that in the last decade the picture has changed dramatically, this damning indictment is echoed in contemporary research, with some educational research findings described as ideologies and unsupported ideas (Bennett, 2017; Christodoulou, 2014). Nelson and O'Beirne (2014) state that educational research, and particularly that into EIP can be poor quality, piecemeal, small-scale studies that are insufficiently contextualised and unrelated to everyday practice, leading to misunderstanding and flawed implementation. These views are long founded, with Dewey (1929) raising concerns about the transfer of knowledge between laboratory and classroom, the bridge between research and practice (Hammersley, 2005). This gap between research and practice has led to the assertion that *'The positivist dream of research creating the perfect teaching is not only difficult but impossible in principle'* (William et al, 2004 p51).

Generalisability between contexts is one of the major criticisms of educational research (Cain, 2017; Dewey, 1929; Nelson and O'Beirne, 2014). Though acknowledging the need for cultural rationality; understanding that some contexts are significantly different from others, Cain (2019) asserts that the concern is itself overgeneralised. Many stable phenomena, and research findings are relatively generalisable when teachers can look at patterns, and step back from the individuals and details of day-to-day teaching. Cain points out that teachers do in fact make useful generalisations regularly, and just as a lesson can be replicated year after year, so to can many educational findings (Cain, 2019). Practitioner research too may be an avenue for contextualising research (Cain, 2019; Stenhouse, 1981).

Despite the long list of criticisms, and to repeat the benefits of research engagement, it is better than the alternatives (Cain, 2019) or, put more directly by Sir Kevan Collins: '*If you're not using evidence, then you are using prejudice'* (Evidence Based Education, 2017 in Cain 2019 p10). Goldacre (2013) and Hargreaves (1995) also concede, that though not perfect, research does provide a way to challenge our practice and inform positive professional changes.

Time and Workload

Teachers in the UK come third highest in terms teaching hours internationally (Malin et al, 2020) and teachers work more overtime than any other UK profession (Wiggins, 2015). Hand in hand with workload is time pressure, and time has been cited as one of the most significant barriers to research engagement (BERA, 2014; Bubb and Earley, 2009; Mitchel, 2013). As such, research for CPD or otherwise is seen as a luxury (Brown et al, 2021; Galdin-O'Shea, 2015) or an unnecessary burden (Stewart, 2015), and in a review by Jerrim and Sims (2019) 46% of teachers felt there was no incentive to take part in research as CPD, and 65% felt that CPD conflicts with work commitments.

CPD and other initiatives add time and workload, but there is recognition that significant time and commitment is required for research engagement to be effective. For

example, Coldwell et al (2017) suggest that without set-aside time for informed debate and application, the most research informed institutions cannot maintain research engagement. Moreover, compromises in time negatively affect the impact of research application, as in the rush to find quick solutions there can be a lack of critical engagement (Rogers, 2020; Cain 2019).

If time and workload are seen to impinge on already heavily burdened teachers then costs may outweigh the benefits of EIP, or if research is valued as a sign, may lead to superficial research engagement (Cain, 2019; Little and Curry, 2009; Earl and Timperley, 2008). One suggestion to balance EIP against time and workload is protected time, or research INSET days, but these have financial implications. Perhaps the only viable solution is to reframe the issue of time (Cain 2019). Recognising time is finite can help schools prioritise, and research is a favourable priority for its ability to act as a vehicle for school improvement, improved pupil outcomes and CPD. Additionally, by creating dedicated time for research, though not *freeing up* teacher's time, provides the structure for teachers to engage in research (Cain, 2019; Berliner, 2020; Cordingley et al, 2018).

4. CPD and models of research engagement

Features of good CPD

CPD has been described as critical to improving the quality of teaching (BERA, 2014; Byrne, 2021). Quality CPD helps with retention, shared efficacy, and beliefs. CPD also has positive impacts on teaching and pupil outcomes (Cordingley, 2013). However, what makes CPD high quality? The answer is increasingly that it is research based and involves enquiry (Tinsley, 2021; Cordingley, 2013; DfE, 2016).

In a review of CPD in the UK, Coldwell et al (2017) suggest CPD providers should grow the independence of teachers to engage proactively in and with research, and these

approaches should encourage dialogue. Cordingley et al (2015) describe a host of benefits of research rich CPD and highlight common features of effective CPD models, all closely related to research processes. Of relevance to this research are that research based CPD should provide opportunities for professional dialogue, involve two or more terms sustained enquiry, involve explorative literature and peer observation, and be endorsed by leadership.

Professional dialogue and peer observation offer a collaborative approach and help motivate teachers, both volunteers and conscripts, to persist in their research engagement by providing emotional and practical support. These findings are consistent with the OECD (2016) which found collaboration improved outcomes, and Brown (2017) finding research is used to its best with frequent and useful interactions about teaching and learning. However, not all professional dialogue is created equally; learning is more likely to occur when CPD provides a platform for argumentation and discussion about research stimuli (Stoll et al, 2006; Wiliam et al, 2004; Cain, 2015), but dialogue can lead to a focus on establishing friendships and peer support which does not lead to critical evaluation and learning (Stoll et al, 2006).

Involving teachers in sustained enquiry (Cordingly, 2013) creates a structure and goals like those that teachers might apply to pupils, a feature of good CPD (Coe and Kime 2021). It also advocates for practitioner research which is consistent with BERA (2014) finding that the best research schools sustain teacher research through structured enquiry throughout their careers. This long-term approach has been shown to improve teacher engagement and pupil outcomes (Tinsley, 2021; Timperley et al, 2007; Cordingley et al, 2018) linked with the finding that teachers engage more positively in research when it is seen as a process rather than a body of knowledge (BERA, 2014).

Teacher Research

Teacher, or practitioner research was encouraged by Stenhouse, who coined the term teacher-as-researcher. His conception of teacher research included: systematic questioning of one's

teaching, skills to study one's teaching, and to question and to test theory in practice (Stenhouse, 1975). This was put by Mannion (2017) as a systematic process of reflection on one's teaching practice, trialling intervention, and evaluating the impact, with the goal of improving one's practice. An additional feature of practitioner research is that it is concerned with generating knowledge for specific contexts rather than creating generalisable data (Cain, 2019).

An advantage of practitioner research is that it acts as a form of knowledge generation and CPD (Cain, 2019) and many models conceptualise teacher research as CPD. Central to these approaches is the question: how can I improve what I am doing? (Whitehead, 1989). A starting point here may include looking at school-based data to identify the needs of the pupils (Timperley et al, 2007) this pupil focus is key if the goal of the research is to improve pupil outcomes (Cordingley et al, 2015; Timperley et al, 2007). However, it should also be possible to improve pupil outcomes through improved teaching (Coldwell et al, 2017) so should also consider the development of the teacher, and the goals of the teacher in engaging in practitioner research.

It is suggested a successful programme of practitioner research should involve three factors: interested volunteers, an interpreter of research, and a scheduled time and place to meet (Berliner 2020). The first element is supported by research showing teachers are more likely to commit to practitioner research if they have choice about the research topic (Coe and Kime, 2021; Kraft and Papay, 2014; Weston et al, 2021). Giving teachers' freedom of a research topic relating to personal interest may improve the memory of that learning, especially if the choice is linked to future plans (Klein, 2014) and this approach has had successes (Willott, 2020), especially if involving classroom problems to which the answer is not known (Cain and Harris, 2013). However, there are issues with too much freedom of choice (Stafaninni and Griffith, 2021) as teachers can become over ambitious; it is therefore practical to provide parameters which provide options (Fillingham, 2020; Stafaninni and Griffith, 2020).

To provide an interpreter of research, is contingent on the skills of the staff involved, those with research experience or involved in postgraduate programmes find it less challenging

than staff with limited research experience (Cordingley et al, 2015). Accessibility of research is also a significant challenge to research engagement (Goldacre, 2013; Rousseau and Gunia, 2016; McIntyre, 2005) which may be overcome through research champions (Burn et al, 2021). Like Berliner's (2020) interpreter, the research champion not only promotes research use, but also provide support in understanding research. A research champion can help teachers understand ethical considerations, and the control, or lack thereof, of classroom variables, (Whitehead and McNiff, 2006), as well as putting constraints on the data collection so that teachers can work on a manageable project (Cain, 2019).

Providing a scheduled time and space is a structural feature of teacher research and can be seen as providing opportunities for discussion and to undertake research itself, which is a technique for improving EIP (Berliner, 2020; Coldwell et al, 2017). Indeed, unstructured approaches are shown to have limited impact on teacher development and pupil outcomes (Langer et al 2016).

Example Models

Here I will outline two models aimed to provide CPD through engagement *in* research. Research engaged CPD models vary from university led to teacher led models (Cordingley et al, 2015; Cain, 2019). For the purposes of this research and owing to constraints of time and practicality I will be focussing on school led research, while remaining open to university and wider research links in the future.

Model 1: Fillingham (2020)

Fillingham (2020) introduced collaborative enquiry groups (CEGs) into an independent school in London. These groups were led by volunteer members of the senior leadership team, and

teaching staff. Leaders each took on a topic linked to the school development plan and were charged with finding related literature and leading six one-hour meetings across the academic year. They were given paid for membership of the CCT to support this.

It was mandatory that teachers joined one of these groups but could choose which. Teachers had to attend the meetings and discuss the provided research, carry out an intervention based on the research, observe, and be observed using the research topic in a lesson, and to report their findings at a poster conference. In recognition of the commitment the CEGs involved, an inset day was removed, effectively providing teachers with a day off.

Fillingham (2020) described the approach as a qualified success with a significant proportion of staff reporting improvements in their practice and feeling that they could be described as teachers and researchers. It was noted however, that it was difficult to maintain momentum across the year, and staff felt there were significant time pressures.

A strength of this approach is the CEGs design which builds in time for collaboration and teacher research, both shown to be effective in EIP and CPD (Cordingley et al, 2013, Cain, 2019) Additionally, the ability to choose which group to work in provides a level of choice likely to increase engagement (Bubb and Earley, 2016; Coe and Kime, 2021), however, choice is restricted to existing groups and there is expectation that all staff take part, which led to scepticism and affected motivation (Fillingham, 2020). This model also created a structure to support the research (Cain, 2019; Cordingley et al, 2018) and tried to redress the issue of time and workload (Cain, 2019; BERA 2014. Arthur et al 2004), by limiting the meetings to one per half term, and returning a day to the teachers involved.

Model 2: Tinsley (2021)

Tinsley's approach is part of a multi-academy trust pedagogy-champion programme, which at the time of writing is in its eleventh year and is based on engaging teachers in practitioner

research. The programme has four stages, with collaboration between members taking place in half termly meetings. The first of these is deciding on an area of research. In this stage teachers from across the trust are nominated by their school leaders to take part in the programme, and an area of research is decided for the teachers; based on the needs of their department, and *problems* identified in school data. Stage two involves engaging with research: following a session where teachers are given advice on how to access sources, including paid membership of the CCT, teachers read through and comment on literature provided on a Google Classroom. Care is taken to ensure this is accessible for the novice teacher researcher. The third stage, which takes place in the spring term, is the research intervention. Following ethical and methodological approval, teachers assess the impact of their intervention over a ten-to-twelve-week period. The final stage involves sharing and celebrating the research in an event which involves the different groups presenting their findings and submitting articles to an online journal.

A difference between Fillingham's (2020) and Tinsley's (2021) approach is that the latter is clearly long established, with robust procedures, this is particularly noticeable in terms of deciding on the area of research, with Tinsley's approach removing the element of choice in favour of a diagnostic, problems-based approach which may have greater impact on student outcomes (Timperley et al 2007; Cordingley et al, 2015). Tinsley (2021) also pays attention to selecting accessible research and builds in time to acquaint teachers with research skills needed to critically engage (Berliner, 2020; Goldacre, 2013; McIntyre, 2005).

Like Fillingham (2020) this approach also builds collaboration into the process, provides access to research and the CCT, and provides an opportunity to share and celebrate the research, an important feature of research engagement (Cain, 2019). However, the methods of sharing research differ, though both use a conference event, involving school leaders and providing celebration and validation (Robinson et al, 2017). Tinsley's researchers also contribute to an online journal, which provides a tangible artifact which can act as a motivator, but also can add significantly to workload, and lead to drop out (Cain, 2019).

Rationale

The evidence presented in this review has outlined the key features of research informed CPD to include collaboration and sustained enquiry (Cordingley, 2013; Berliner, 2020, Cain, 2019). with a growing body of research showing that evidence informed practice acts both as a form of CPD by improving the quality of teaching, and, under the right conditions, pupil outcomes (BERA, 2014; Cordingley et al, 2018, Timperley et al, 2007; Bell et al, 2010). Though both engaging in and with research has positive outcomes, this intervention will focus on engaging *in* research for the added benefit of engaging teachers in the process of research and the added structure this creates (Cordingley 2013, Dimmock 2014, McIntyre 2005).

The benefits of research outlined by Cain (2019), the features of quality CPD from Cordingley et al (2013; 2015; 2018) put into practice by both Fillingham (2020) and Tinsley (2021) will inform the design of my intervention to engage teachers in research, through an innovative use of LRGs for CPD. The success of this intervention will be evaluated against these same features of Cain (2019) and Cordingly et al (2013; 2015; 2018) in addition to Brown's et al. (2021) use of Baudrillard's (1968) theory of objects.

METHODOLOGY

Throughout this intervention, I intend ultimately to investigate if engaging teachers in research is an effective form of CPD by answering the following questions:

1. Does engaging in research through learning research groups improve teachers' practice?
2. Is engaging in research through learning research groups a useful form of CPD?
3. What is the school leadership's perception of a learning research group approach to CPD becoming a whole school practice?

To answer the second and third question, I will draw on two theoretical lenses, the first, in application to question two, are the five features of research engagement outlined by Cain

(2019) integrated with structural features identified by Cordingly et al (2015), that research engagement can improve pupil outcomes and teacher professionalism by improving decision-making, broadening teacher mindset and creating intelligent communities, and involve sustained enquiry, with opportunities to collaborate. The second lens will be based on Brown et al (2021) application of Baudrillard's (1968) system of objects, that research has potential costs, benefits and value as a sign which determine its use, and this will be applied to question three.

The Learning Research Group

The intervention consisted of the introduction of LRGs that engaged in sustained practitioner research over the course of an academic year, providing teachers with the opportunity to engage in cooperative, individual and/or collaborative research which was disseminated through an in-house learning research journal and poster conference. This served to celebrate the work of those involved (Robinson et al 2009; Cain, 2019).

Design of the LRG

The LRG was based on the discussion groups and practitioner research involved in the MSc in learning and teaching at the University of Oxford. However, instead of grouping by subject, teachers volunteered to one of five LRGs led by teachers with specific research interests, like the design implemented by Fillingham (2020), however, to encourage engagement, choice was deliberately built into the LRG. (Bubb and Early, 2009, Coe and Kime, 2021).

The leads met regularly with their groups and provided research literature discussed in the autumn term. Discussion was essential at all LRG meetings (Roberts and Pruitt, 2003) to share the experience within the groups (Schön, 1983), with leads guiding reflection on the reading (McArdle and Coutts, 2010; Robinson et al, 2017; Calderhead, 1987). In the spring term the groups ran practitioner research based on their reading which were written up and published in an in-house journal and presented in a poster conference to governors.

Roles and responsibilities

In June 2021, staff with research experience or a particular interest in an area of teaching practice were approached and asked if they would lead a research group. Additionally, at INSET in September a survey was sent out to all teachers for expressions of interest in leading a research group. Group leads were offered the incentive of paid membership to the CCT, this would be extended to group members on completion of the research project.

Five members of staff, including myself volunteered as group leads in the following research areas: memory and recall, reflective peer observation, cognitive neuroscience and the teenage brain, metacognition and self-regulation, and collaborative learning. Group leads attended an initial meeting, where they were briefed on their roles and responsibilities. The group leads collaborated and agreed the expectations of the roles of group leads and the assistant head in relation to the LRG. The roles can be seen in detail in Appendix A, but in summary, I, as Assistant Head monitored the LRG programme, deadlines and supported leads. The group leads provided research and methodological advice to their group members in a specific research area, and the group members attended meetings, discussed reading and caried out their own practitioner research.

LRG Schedule

The original schedule divided the research process across the three terms into three stages of research: reading, conducting research and sharing findings. This was planned to help manage workload for the group leads and members; splitting the process across the year allowed time for the project to be maximised and added a degree of flexibility.

In September I had an opportunity to collaborate with a former MLT student, CF who had undertaken a similar research project. We discussed how his staff had struggled maintaining engagement across the academic year and so on reflection I reduced the timeframe by one half term, with the initial findings shared at inset and the write up completed over the Easter holidays and shared formally in May. This adapted plan (Appendix A) was shared with the group leads

during INSET in September. The plan, which also provided guidelines for meetings at different times, was agreed by all and was to be shared in initial group meetings when teachers had signed up.

A further change was made after group members had signed up at INSET. Unfortunately, no one had joined the reflective peer observation group. To provide a way for the lead to gather data for their research I collaborated with them to integrate reflective peer observation into the schedule. This was mutually beneficial as it created an opportunity for teachers in the LRG to partake in mutual lesson observation; valuable in teacher research (Cordingley et al, 2015; Van Gasse et al 2017; Laroes et al, 2018). The schedule changed again in January when it became clear that the differing pace of the groups, and an inspection meant it was unrealistic for the data collection to be completed by the February half term. As such the data collection was extended to May half term, and the deadline for the publication of the journal and poster conference moved to the mid-June.

Collaboration

Collaboration was central to this project as interventions are more likely to succeed with teacher buy in, and providing opportunities for stakeholders to contribute to the design and implementation of the LRG helped to promote engagement (Bubb and Early, 2009; Coe and Kime, 2021). Collaboration also contributed to the development of intelligent communities- a potential benefit of research engagement (Cain, 2019) and motivation for both volunteers and conscripts (Cordingley et al, 2015).

Collaboration started with permission from the headmaster and deputy head to change the teaching and learning group into a research group, and to provide incentives for those taking part, including membership of the Chartered College of teaching and an Academic Dinner, both paid for by the college. More directly, collaboration with the group leads involved agreeing and refining the roles and responsibilities of those involved in the LRG, and adapting the schedule to different pressures in the year.

Collaboration also occurred externally, with CF providing advice and allowing me to adapt his instruments of data collection to my project. My supervisor also looked over my initial questionnaires to help assess face validity.

The Intervention and Data Collection Timeline

Table 2 clarifies how the process of data collection and the timeline of the LRG coincided.

The Intervention	The Research Process
Summer 2021	
• Group leads volunteer	• Reading/ planning the intervention
Autumn 1- September to October	
• Inset introduction • Volunteer members sign up to one of four groups • Initial group meetings	• Initial questionnaires sent to group leads and group members • Review initial data set
Autumn 2- October- December	
• Small in class action and reflection • Group Meetings • Additional reading	
Spring 1- January to February	
Discussion with group leads, changes to timeline • Intervention planning • Intervention pilot • Reflective peer observation • Group meetings o Meeting is focussed on research methods and data collection) o Sharing writing templates o Sharing 'write up' examples	• Mid-project questionnaire sent to group leads and members • Review data and make any changes to intervention as needed o This alongside informal discussion with group leads lead to changes in the timeline o Compare initial and mid project responses
Spring 2- March- April	
• Academic Dinner • Run intervention • Data collections • Further Meeting on data collection	• Collect outstanding mid-project questionnaires • Differences in group approaches noted- decided to let groups decide on their

• Share write up templates • Further 'write up' examples provided	own strategies with guidance when/ where requested
Summer 1- April- May	
Discussion with group leads, changes to timeline- extending the data collection to the middle of this term • Data collection extended window *ISI inspection leads to extended deadline to write articles* *Adjustments made for individuals struggling to meet deadlines* • Deadline for articles at the end of half term • Plan poster conference	• End of project questionnaires sent out to group leads and members • Review end of project questionnaires • Prepare initial findings
Summer 2-	
• Articles printed prepared and printed for journal • Poster conference to governors • End of project	• Articles reviewed; data used for MLT • Interviews conducted with group leads and members • Interviews conducted with headmaster and Deputy headmaster about long term/ whole school value of the LRG project

Table 2- The research and intervention timeline

Participants

Twenty-three teachers from a non-selective independent school in Oxfordshire (boys only in years seven to eleven, coeducational sixth form) including myself, took part in the research group. There were twelve females and eight males with a range of teaching experience from zero to fifteen or more years. The majority had between zero to four years' experience.

Twenty teachers submitted an article and fourteen completed the questionnaires consistently which form most of the findings of this project. Four teachers completed an interview regarding their experience of the LRG and two senior leaders took part in an interview regarding their views on the LRG, the deputy head academic, and headmaster.

Research Design

A mixed methods approach was taken (Creswell and Clark, 2017), using positivist and naturalistic paradigms (Cohen et al, 2018). Quantitative data was collected through closed questions in the questionnaires sent out to group members and leads. This was seen as beneficial to standardise the terminology relating to research use and provide consistency in interpretation. This enabled me to compare attitudes to the LRG more consistently and with greater clarity than with purely qualitative responses. Quantitative data is often used in educational research to corroborate qualitative data (Koshy, 2010) and the LRG project followed this practice.

Qualitative data was acquired from both open questions in the questionnaires and through two semi structured interviews. Qualitative data was purposively sampled to explore themes and find specific examples in relation to responses to the closed questions, and elements of research use outlined by Cain (2019). The qualitative data was used explanatorily rather than exploratively- to offer deeper insights into the findings of the quantitative data.

Questionnaires

To assess changes and improvement in practice over the course of the LRG (question 1), three questionnaires were sent out to group leads and members. Online questionnaires were shared via Google form, offering advantages of anonymity, speed, higher response rates, and convenience (Cohen et al, 2018). These were sent before the first meeting in September, at the midpoint in March, and towards the end of the project in May (Appendix B).

The initial questionnaire garnered data regarding the attitudes of teachers towards educational research, their level of engagement with research, and their reasons for signing up to and expectations of the LRG, it can be seen as a baseline measurement (Koshy, 2010; Buck, 2018). The second questionnaire included previous questions but also looked to evaluate the LRG, with questions being asked about what had and had not been considered enjoyable and useful, and whether expectations had been met. This also allowed for changes to be made to the administration of the LRG if required, and so can be seen as a vehicle of collaboration in addition to data collection. The final questionnaire had much the same aims as the second but included key questions regarding the impact of the LRG on the participants' practice and how the LRG compared to other forms of CPD. The use of pre, mid, and post-intervention questionnaires, an established practice in educational research (Cohen et al, 2018; Menter and Thompson, 2018), allowed evaluation of the impact of the LRG. All questionnaires offered a mix of quantitative data through set response and Likert questions, and qualitative data via open questions and were used to address research questions one and two.

Interviews

Questionnaires are limited tools for in-depth probes (Cohen et al, 2018) and so a group interview was conducted with four volunteers from the LRG, including two leads. No interviewees were from the same LRG. Group interviews were considered beneficial in promoting discussion and raising factors I had not considered (Watts and Ebbutt, 1987). It was also possible to provide some consensus (Morgan, 1988), and to look at how teachers responded to each other (Denscombe, 2017). Findings from the interview were used as conversation as research (Brinkman and Steinar, 2015), and as further exploration of the questionnaire data (Koshy, 2010). I tried to avoid sharing my own opinion in these interviews, unless asked directly, and to limit the time of the interview (Koshy, 2010; Cohen et al, 2018). I also tried to remain aware of the power imbalance in all interviews but particularly in my role as Assistant

Head and visible leader of the LRG, and how this could affect the reliability and validity of my findings (Brinkmann and Steinar, 2015; Cohen et al, 2018).

A separate interview took place with the deputy head academic, and headmaster to investigate the third research question, involving the views of senior leadership regarding the benefits, costs, value as a sign (Brown et al, 2021) and future application of the LRG. This too was a semi-structured group interview, but the opposite power dynamic had to be considered in that I was cautious of not 'pitching' my agenda and appearing overtly partisan to the LRG to those with the power to implement it. I maintain some caution about the reliability of the findings of this interview with senior leaders representing the college being at risk of social desirability bias, particularly regarding the value as a sign the LRG may represent.

Learning Research Journal

At the conclusion of the LRG, participants contributed an article summarising their practitioner research, or in some cases literature reviews to the internal research journal (Appendix C). Findings from this journal are purposively selected to demonstrate changes in practice and engagement in research.

Analysis

The quantitative data is displayed graphically, demonstrating trends across the members of the LRG. The qualitative data was analysed through thematic analysis, providing flexibility and rich data to support the quantitative findings. The process involved was similar to that outlined by Braun and Clarke (2006), involving familiarisation with the data set, identifying initial codes, interpretation of codes, finding examples, and the analysis of findings. Thematic analysis can also quantify open responses (Peel, 2020) and offer possible explanations of differences in data

sets, to create a more complete picture, and to assess the reliability of the findings (Denscombe, 2017).

The themes and codes used were in part drawn from Cain's (2019) goals of research engagement, which include improving pupil outcomes, teacher professionalism, decision making, intelligent communities and teacher mindset and these are integrated with Cordingley et al (2015) features of research engaged CPD including structural features sustained enquiry and challenges of research engagement, and Coe and Kime's (2020) emphasis on ownership. A list of codes and example coding can be seen in Appendix D. These features form the central framework for the analysis of the questionnaires and teacher interview to address all research questions, but particularly question two. These themes were approached deductively, but sub themes were drawn inductively as were additional themes. Analysis of the third question included those themes identified above, under the sub themes of perceived costs and benefits, as well as the third theme of value as a sign, adapted by Brown et al (2021).

Ethics

The nature of the project meant few ethical issues conflicted with the aims of the research. Ethical approval was granted in line with the University of Oxford via its Central University Research Ethics Committee (CUREC), the headmaster consented to research under the modus operandi (Appendix F). Informed consent for collaborative practitioner research from all teachers involved was gained (Locke et al, 2013) and it was made explicit that participation in the LRG did not equate to participation in my research and that teachers were not compelled to take part in the surveys or interviews and were made aware of their right to withdraw. The college did stipulate the early career teachers (ECTs) and Post Graduate Certificate of Education (PGCE) students had to partake in the LRG, but again there was no compulsion to complete any of my research. Thought was also given to the ethics of the burden of participating in research in

terms of time pressure and workload (Locke et al 2013) and addressed through the consent, and ability to participate to a greater or lesser degree as possible.

My position as an Assistant Head causes a power imbalance (Brinkmann and Steinar 2015; Cohen et al, 2018) which may affect the responses in self reports. Teachers too may not fully trust the confidentiality of online questionnaires and could respond with demand characteristics to their school leadership. Additionally, with a small sample, to know if practice and attitude changed across the LRG process it was necessary to have identifiers which were later anonymised, it is possible that this may have affected the validity of responses (Cohen et al ,2018). Data from questionnaires and the interview transcripts have been anonymised and stored securely in electronic files which are not shared. There were no participants from vulnerable groups.

FINDINGS

1. Does engaging in research through learning research groups improve teachers' practice?

Improving Practice

This is perhaps the central question to evaluate the use of LRGs as a form of professional development, indeed, in the initial survey teachers were asked what they were hoping to gain from participation in the LRG, and many responded as below: (Further examples of coding can be found in Appendix D).

To develop my practice and apply new tasks, activities & findings to my classes to benefit their learning.

-Carl

This example highlights the perception that research engagement has the potential to develop practice and improve student outcomes. That this is a common response suggests

teachers in this context are increasingly interested in research engagement, consistent with research that there is a growth in interest (Cain, 2019; Hattie, 2008).

In the final questionnaire, teachers were asked: *to what extent do you agree that participation in the LRG has improved your practice*? (Figure 2), 12/14 respondents felt that participation had improved their practice, consistent with findings that engagement can improve practice (Cain, 2019; Cordingly et al, 2018). This finding is an increase on responses in the mid-project questionnaire (Appendix E), implying benefits of a sustained approach (Cordingley et al, 2015).

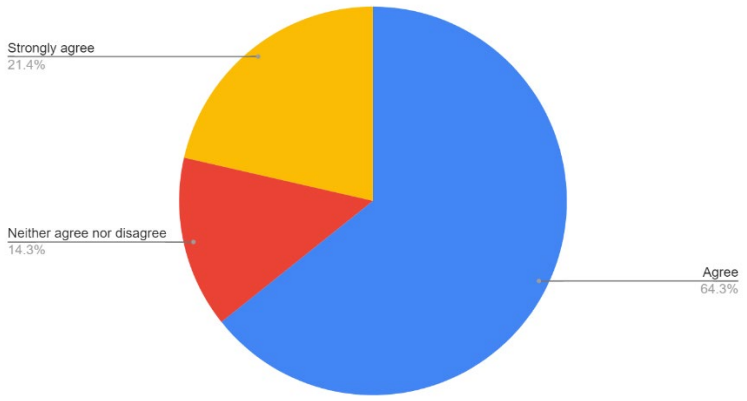


Figure 2- Improvement in Practice (N=14)

These findings are echoed in some of the responses in the teacher interview:

Did my teaching improve this year? Yes… and as such we know that something like metacognition does improve outcomes, so…. we knew from that that, it's going to be a useful exercise.

-Guy

In this example, the teacher states that their practice has improved, and they attribute pupil outcomes from their own statistical analysis as a measure of this success. This teacher was part of the metacognition group, which worked collaboratively as opposed to cooperatively,

facilitating access to a wider data set which was analysed statistically to draw conclusions about student impact, seen in their confident assertion that '*metacognition does improve outcomes'*

Changing Practice

Regarding a change in practice (Figure 3). Though teachers respond in the affirmative, it is not as resounding as responses to the question in Figure 2. In comparison to other questions, it does not seem that this is an issue with the reliability of respondents, more that research engagement has refined rather than changed practice. This can be seen in responses to the follow up question: *If your practice has changed, has that change been an improvement?* 11/14 teachers said yes, with 3 saying maybe (Appendix E).

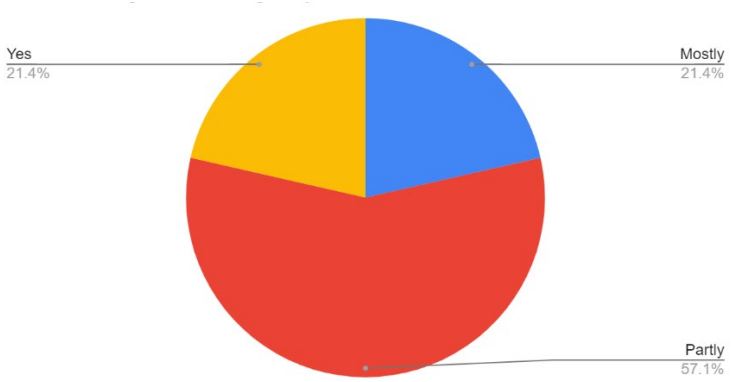


Figure 3- Has your practice changed as a result of participation in the LRG (N=14)

In an example that can be seen as the LRG refining practice rather than changing it, one teacher said the following:

...the whole reason I signed up to in the first place was to sharpen up my practice

-Otto

Furthermore, one teacher highlighted that though they did not feel their practice had changed this year, their involvement would improve their practice the following year:

I don't feel this year, in particular, what I was doing has changed the way I was teaching because it ..., I think it's going to change the way I'm going to teach certain topics next year.

-Lisa

This example is more consistent with slow thinking (Kahneman, 2011), with the teacher applying findings, and considering planning for future curriculum decisions.

There were also examples of improvement and changes in practice to be found in the learning research journal (Appendix C). These were evident regardless of each teacher's career stage, with one PGCE student in the metacognition group stating:

I have been completing my PGCE this year and being involved in this research group has had a profound impact on my practice.

-Perry

Similarly, the deputy head concluded:

In my wider teaching practice, I have since been very explicit in my thinking skills, verbalising my approach to problem solving when presenting models to the classroom.

-John

In summary, though there is some disagreement about whether improvement equates to a change in practice, teachers do perceive that their practice has improved from their participation in the LRG.

Engaging in and with Research

Though the above address the research question, that participation in the LRG can improve practice, it is not clear which elements of the LRG were beneficial; specifically,

whether research engagement improved practice. This is addressed in response to the question in Figure 4.

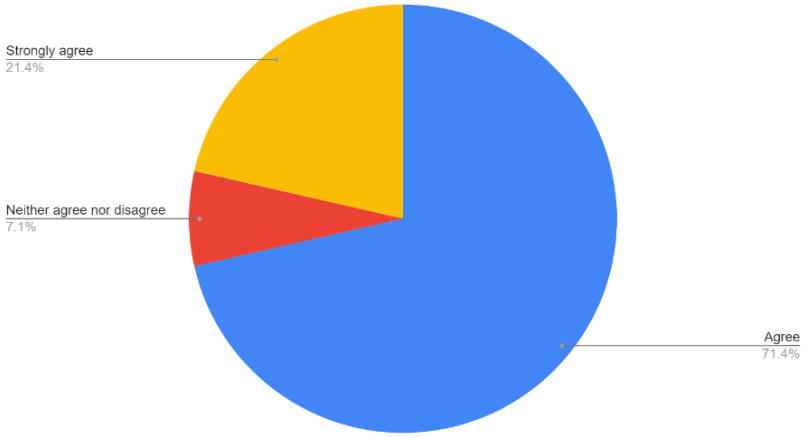


Figure 4- To what extent do you agree that you have applied research in a way that has improved your practice? (N=14)

All but one teacher agreed improvement in their practice could in part be attributed to EIP, consistent with evidence about the advantages of EIP as a valuable form of CPD (Cain; 2019; EEF, 2017; Coldwell et al, 2017). This too is an improvement on earlier responses which were also favorable (Appendix E). On further examination of the questionnaires, a higher proportion of teachers strongly agreed that applying research was of benefit than they did for reading research, one teacher also disagreed that reading research was beneficial to them (Figure 5).

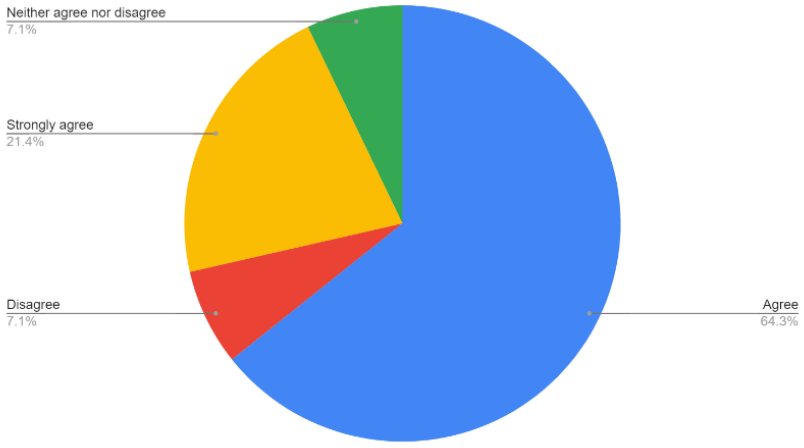


Figure 5- To what extent do you agree that reading academic research has improved your practice? (N=14)

Although it is hard to distinguish between engaging *in* and *with* research in the responses of teachers who may be unaware of the difference, the focus on application is interpreted here as engaging *in* research. This can be seen in the example below:

There's just so many books, there's so many resources, there's so many people, there's so much you can engage with, having to focus on one area and taking that and applying it to practice has been really beneficial…

-Fiona

This teacher alludes to the growing availability of research (Stafaninni and Griffith, 2020; EEF, 2019; Guilfoyle, 2020) but distinguishes between engaging in and with research, arguing that a single focus that is applied to practice has improved their teaching.

This teacher went on to highlight a strength of practitioner research outlined by Cain (2019): that it is context specific:

Reading it and applying it has been incredibly beneficial, so you take the bits that are relevant to you... to your students and giving it a go, and I'm seeing it work.

-Fiona

It is the reference to *'your students'* that highlights the contextual feature, the research is moved from the abstract to the specific.

A motivational element of research engagement was also identified:

You're reading about it then you're doing it and it's backing up what you've read. There's something really rewarding about that and also encouraging.

-Fiona

Though confirming research can be understood as motivating, the opposite was also motivating:

[When others are stating] look at this amazing resource that I'm doing and students are loving it… whereas I've now done the research to potentially say it's not as beneficial as what they're making it out to be, and I know that myself...

-Lisa

This is an example of research disputing findings, a benefit outlined by Cain (2019) as research being better than alternative methods of making decisions.

Though responses in Figure 4 and the examples above focus on benefits of engaging *in* research, it is important not to overstate the negative; engagement *with* research was still valued, suggesting all elements of engagement can improve practice if they are sustained and informed (Cordingly et al, 2015).

Pupil Outcomes

Research engagement has the dual benefit of acting as CPD and contributing to improved pupil outcomes (Cain, 2019; Lofthouse, 1975). The findings of the questionnaires support this. Above we see that teachers see benefits in their practice, and perceive that students benefit from their application of research (Figure 6).

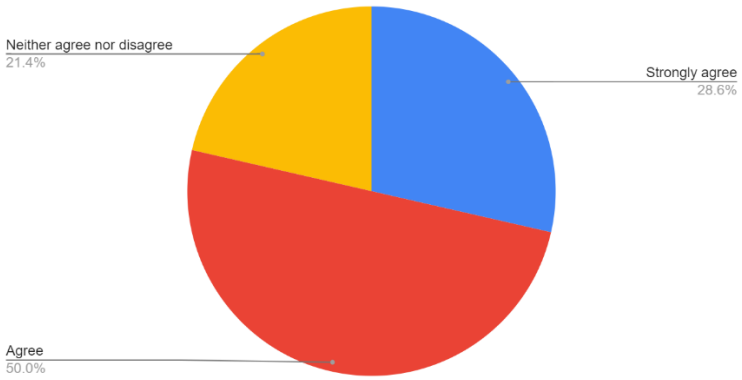


Figure 6 - Pupils have benefited from my participation in the learning research group. (N=14)

In summary of this first research question, teachers did perceive that their practice had improved, and attributed this improvement to participating in the LRG, this was evident in open and closed questions. Engaging *in* research was seen as useful but engaging *with* research also had value. There is also a general view from the teachers that pupils benefitted from teacher involvement in the LRG.

2. Is engaging in research through learning research groups a useful form of CPD?

There are a range of features which constitute good CPD (Cordingly et al, 2015), and findings in relation to this project, including identified challenges will be evaluated against these features and those identified by Cain (2019) all of which are outlined in the methodology.

The teachers that participated in this research were not strangers to CPD, and attendance at CPD was the most common form of research engagement (Appendix E). In the final questionnaire, teachers were asked: *To what extent do you agree that the learning research group has been a useful form of CPD?*

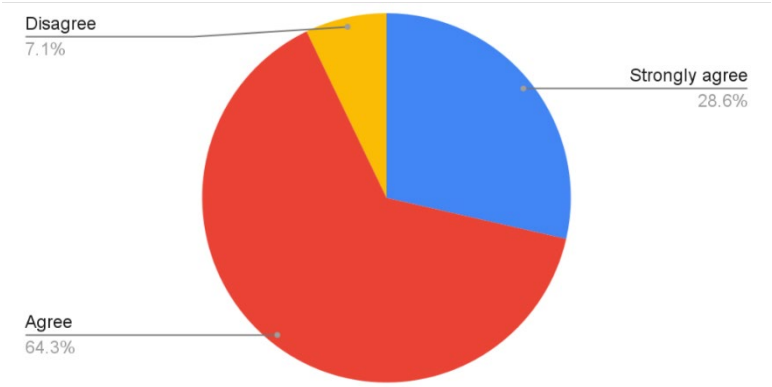


Figure 7 – Usefulness of the LRG (N=14)

All but one teacher saw the LRG as useful CPD. The dissenter was impacted by the advanced information for A-level examinations, which removed the component their research was based on, this may have affected their perception of value. Similar responses were recorded in the question *to what extent do you agree that you have learned more from taking part in the LRG than other forms of CPD?* The responses can be seen in Figure 8.

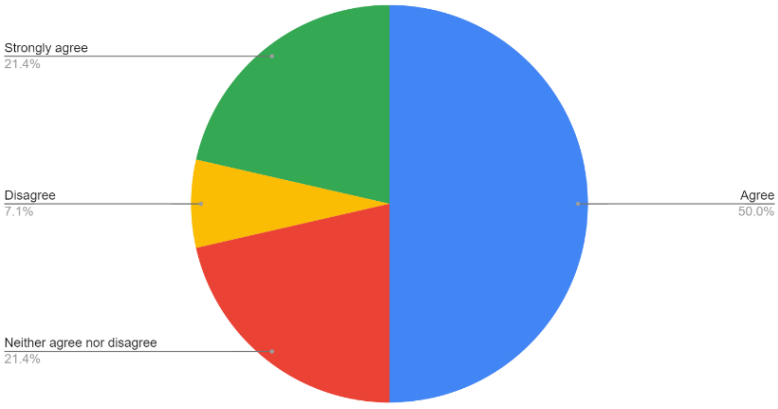


Figure 8 - I have learned more from taking part in the LRG than other CPD (N=14)

The majority agree or strongly agree that the LRG compares favourably against other CPD. One teacher disagreed, and their reasoning was as follows:

Whilst it has been useful to interrogate my practice, subject specific CPD is often more useful as it informs how I deliver specific material to students. I also think that this is research that I could have undertaken without a wider group.

-Jenny

This response is interesting, it is not immediately clear why the LRG is not subject specific, nor why the group element is a problem, though that may be an unrelated issue. The LRG had flexibility built in to allow groups to work cooperatively, collaboratively, or individually with the group acting as a forum and stimulus for discussion. Jenny's group took a cooperative approach, trying different collaborative learning approaches in their subjects. It may be that Jenny felt the topic was generic, and their comparison to *subject specific* CPD refers to content. This is valid, as though teachers engage in research in their contexts, to allow groups of different disciplines to access the research the topics tended to be more universal.

The opposite sentiment was however expressed by some teachers in the interview:

Even subject specific CPD... it's generally generic or it's always generic... so having it very much focused in our context here in Riverside College and knowing... how do we take this research and fit it to our context to improve outcomes for our students...

-Lisa

This teacher valued the context specific element of the practitioner research (Cain, 2019) that was embedded into the LRG, and how the context specificity is not generic, even if the topic of research is.

Structural Features

In the context of this project, CPD structure refers to the design of the LRG intervention, including the structure of the groups, timeline, research journal and practitioner research. These elements include opportunities for professional dialogue, sustained enquiry, and observation among others (Cordingly et al, 2015).

Teachers were asked at the middle and end of the project, whether they were satisfied with the administration of the LRG, and 13/14 teachers agreed or strongly agreed (Appendix E). It seems that in terms of the organisational structure that teachers were satisfied. However, in open questions there is nuance into which structural features contributed to the LRG as useful CPD, outlined below.

a. Practitioner Research

One design element of the LRG was the deliberate decision to engage in sustained enquiry, *in* rather than *with* research and to have teachers contribute to the compilation of the learning research journal (Appendix C). The benefits of this form of CPD have been explored in relation to the first research question, and to avoid duplication will not be explored in depth here. In short, practitioner research was viewed favourably, with teachers emphasising the value of applying research over reading it. This, they considered, led to improved practice and a perceived impact on student outcomes. Teachers also saw value in reading research, and findings suggest research engagement in all forms contributes to improved practice, confidence, and benefits for pupils, consistent with the research findings regarding the benefits of EIP (Cordingley et al, 2015; Bell et al, 2010; BERA, 2014)

b. Design and Structure

An emergent theme regarded time and place for research engagement. This meant a clear meeting schedule, and a timeframe to work on the learning research journal.

Having the learning research gave us that space in the day, head space for me to actually really, consider carefully, my own practice, and how I can improve it. So, I think from a time perspective, setting time aside for that has been really important in terms of improving and developing my own teaching.

-Fiona

This design helped teachers to engage in the LRG, reflecting the literature (Berliner (2020). However, the teacher was not given extra time, but has *'set time aside'* to make capacity for something they considered important, echoing Cain (2019).

However, some teachers wanted clearer expectations at the start of the year:

Is there some way, middle ground we can say you know, you get involved at your level, it's X amount of time over the year… I think that would be quite helpful…

-Otto

However, other teachers valued the flexibility, which had helped them maintain engagement:

I think it has been very flexible, and accommodated what your individual research points are, and what you've chosen to do... So, I think that's something that's been beneficial about it, is that I can kind of accommodate, and it is flexible too.

-Fiona

There is clearly a balance to be struck between setting a clear timeframe for expectations and providing flexibility.

c. Context Specificity

An advantage of practitioner research is that it bridges the gap between research and practice, by making research relevant to the practitioner's context (Cain, 2019). The questionnaire respondents recognised these advantages:

To develop teaching and find what works best for our students. I also think it is important to explore strategies that suit Riverside College specifically...

-Alison

These sentiments had become more developed by the end of project questionnaire:

This was more beneficial because it was aimed specifically at our unique setting, with a chance for teachers to discuss students we have in common. Rather than coming from outside and having to be applied to our setting, this was all about making collaborative learning work at Riverside College.

-Peter

This references cooperative opportunities and contextual professional dialogue. Leadership interviews also highlighted the difference between broad educational research and pupil-oriented practitioner research (Cordingley et al, 2015).

...It depends on the context of the school… to what extent the research is based on pupil engagement or to what it's to extent its based-on theory, and educational theory. Because if... the starting point is based on the pupil context it's more immediately applicable to our school.

-Headmaster

Teachers valued context specificity, despite some teachers sharing concerns about the application of educational research into practice more generally. This was seen in the Likert question regarding the ease of translation of research to the classroom (Figure 9).

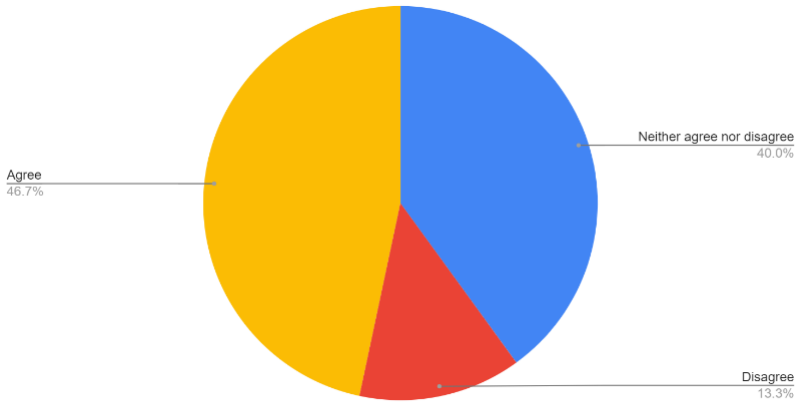


Figure 9 - Initial questionnaire - educational research easily translates into the classroom (N=15)

Though the responses are not unanimously negative, just under half (7/15) agree that educational research is generalisable to the classroom. However, by the end of the LRG, teachers were more confident with 9/14 teachers agreed or better, and no teacher disagreed (Figure 10).

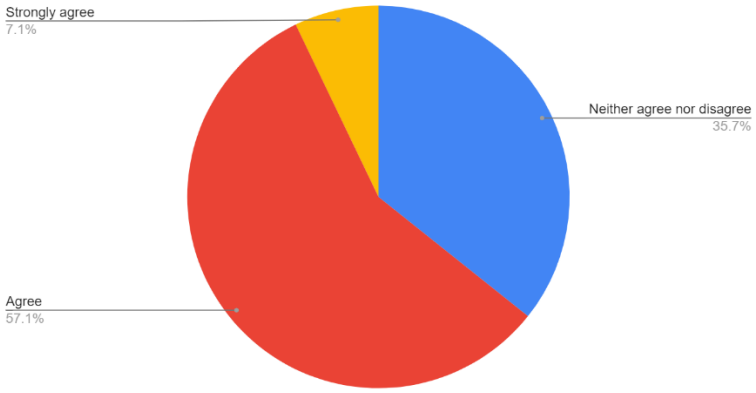


Figure 10 - Final questionnaire - educational research easily translates into the classroom (N=14)

In summary, teachers had had concerns that are prevalent in the literature, that some educational research does not generalise well to the classroom (Cain, 2019; Nelson and O'Beirne, 2014; Williams, 2004). However, these had been allayed by the end of LRG project, with more teachers seeing research as translatable to the classroom. This was consistent with the lack of negative comments regarding context made in all forms of data collection, and the positive comments regarding the ability of practitioner research to focus on the needs of the college and the pupils therein.

d. Ownership

The last structural feature related to ownership. The LRG was voluntary (except for PGCE students and ECTs) and teachers chose their topic. Group leads could choose if they wanted to run their group as a single collaboration, or in a cooperative or individual approach (Van Gasse et al, 2017). Though most joined the LRG to improve their practice and pupil outcomes, teachers did reference personal interest too.

It sounded interesting and I loved Psychology at College

-Merry

CM's response acknowledges prior interest and experience. The headmaster too recognised ownership benefits in the leadership interview:

...For me it's, it's ownership, ownership of their own CPD. They can look at areas of interest for themselves.

-Headmaster

The headmaster intermates that a key benefit is the ownership element, and this theme was explored in more detail in the teacher interview:

I think a problem has been... and will continue to be is how to ensure all teachers engage with research; you could prescribe that all teachers attend certain sessions but actually I think in the context of the learning research group, I think it's almost peer-led, and I think that might be a more effective vehicle of ensuring that more teachers engage with it.

-John

This highlights the risk of disengagement and potential cynicism in the approach of Tinsley (2021) that makes decisions for teachers, John's response argues that by taking a peer-led approach, staff are more like to be bought in, consistent with findings by Berliner (2020) that EIP starts with motivated volunteers, and that choice over the research increases commitment (Coe and Kime, 2021; Kraft and Papay, 2014).

Decision Making

Though the ability of research to improve decision-making is an advantage outlined by Cain (2019), this relates to slow thinking, largely used to inform policy decisions (Slavin, 2004; Kahneman, 2011). This intervention focussed on classroom practice, so few references were made to decision making.

There are exceptions to this, the below is from a school-leader taking part in the LRG describing their views on the role of educational research:

It has reaffirmed my view that it [research]is becoming increasingly important to decision-making in schools. There still needs to be an understanding that not everything will work in every context...

-John

This is consistent with research into the growth of research use in schools (EEF, 2019; DfE, 2017; BERA, 2014).

One teacher gave a textbook example of how research engagement can inform slow thinking processes in decision making for classroom teachers:

I don't feel this year, in particular what I was doing has changed the way I was teaching because it was a trial, I think it's going to change the way I'm going to teach certain topics next year...

-Lisa

In the example above, Lisa investigated a topic and evaluated its impact, and reports how it is likely to change their planning for future years. Though classroom teaching tends to involve fast-thinking and mindset, this is a way slow thinking can influence classroom decisions (Cain, 2019). Though decision making was not as important here as in Cain (2019), there was still evidence of research informing decisions.

Teacher Mindsets

Teacher mindset includes beliefs, behaviours, and routines of teachers (Cain, 2019), these features were seen in the data. Behaviours were prominent in teachers' reasons for engaging with research, which was coded within teacher mindset as teacher repertoire.

Learn new collaborative learning styles and learn how to avoid collaborative learning tasks that may hinder certain pupils

-Carl

The above focuses on techniques and tasks that can be extracted from the research, adding to the teacher's toolkit. There is a theme of newness, but Carl's response also hints at a level of criticality, looking to avoid techniques that are not beneficial, highlighted as an advantage of EIP in (Hargreaves, 1995; Goldacre, 2013). Carl is an ECT, and teaching repertoire was reported by all ECTs which may be expected as they develop their practice

To broaden mindset and meta-processes (Eraut, 2004) competencies, beliefs, identity, and mission need also be affected, and there were examples of this happening:

Primarily what I have learned is that having a deeper understanding of how the adolescent brain works is incredibly important for teachers, in fact it should be a key part of teacher training.

-Fiona

This provides evidence at the beliefs level, implying that knowledge gained from the LRG is something they feel should be part of teacher training, though in a snapshot study it would be a stretch to infer that this has changed the teacher's identity or mission. There were also examples which showed changes to multiple levels of mindset:

> *I believe I have a better grasp on what works and what is not useful. So, when students argue that they merely read over notes, unless I know this student to be a very effective learner, I would dissuade them from this and encourage them towards another method which fits in with retrieval practice.*
>
> *-Marjorie*

Here we see changes in beliefs about what works terms of recall, and how this has affected behaviour, with the teacher implying they would actively intervene to change a students' approach. These findings are consistent with research suggesting that by making research belief, (McIntyre, 2005), changes in meta-process can occur which alter fast-thinking in classrooms (Eraut, 2004; Cain, 2019; Korthagen and Vasalos, 2005).

Intelligent Communities

A central benefit of EIP is its ability to create intelligent communities, by providing the stimulus for professional dialogue around research, and opportunities for cooperation and collaboration (Cain, 2019; Stoll et al, 2006). Collaboration was also seen as a key driver of successful CPD (Bell et al, 2010; Cordingley et al, 2015).

References to collaboration were clear from the outset of the LRG, this can be seen in Figure 11, where working with others was among the most anticipated features of the LRG.

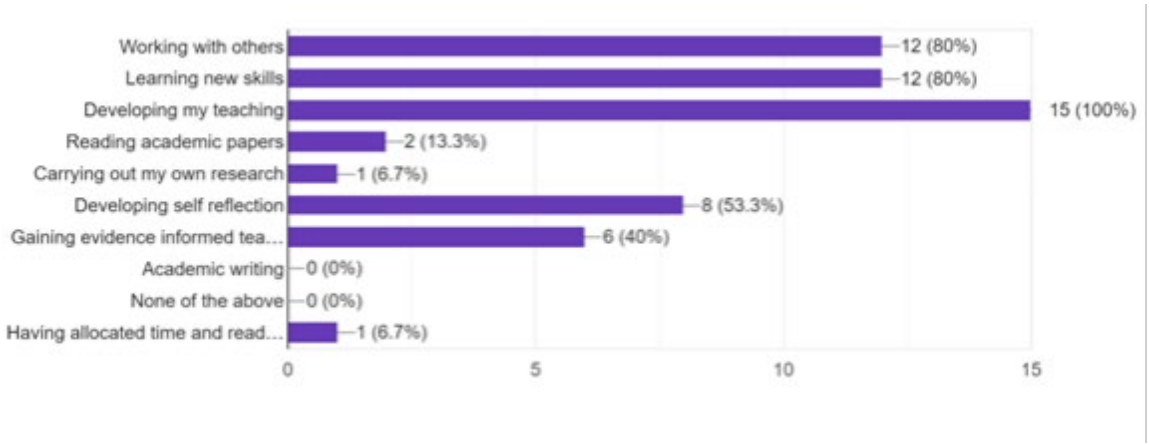


Figure 11: What are you most looking forward to about taking part in the LRG? (N=15)

Collaboration was also seen as one of the most useful features, and by the end of the project collaboration was unanimously considered the most useful feature (Figure 12) consistent with the literature (Cain, 2019; Bubb and Earley, 2009; OECD, 2019).

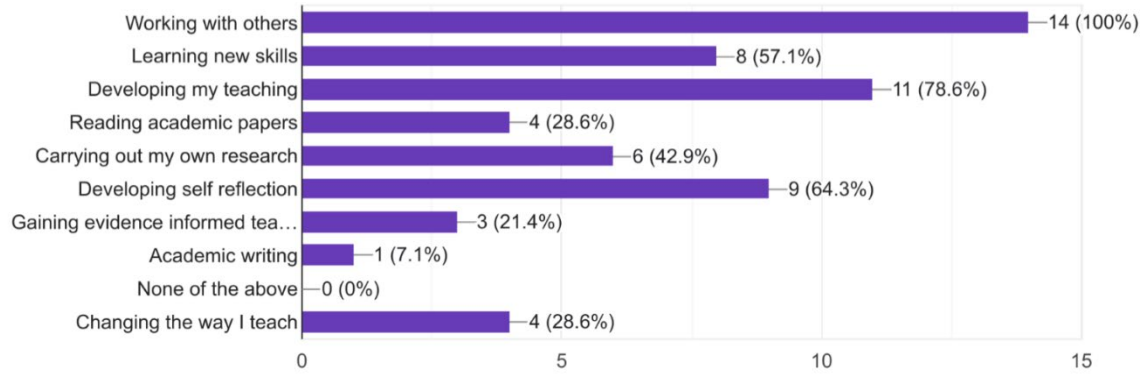


Figure 12, What have been the most useful factors you have experienced by taking part in the LRG? (N=14)

Responses to open questions corroborated the above, with the following examples being typical:

I loved working with others in the group and coming together as a team
-Merry

I have learned a lot from other colleagues that I have tried to incorporate
-Alison

Both of the above involve collaboration, but there is nuance. Merry, an experienced teacher enjoyed working as a team in what can be an independent profession (Cain, 2019), whereas Alison, an ECT, looks to learn from those around them.

Professional dialogue is another feature of intelligent communities (Cain, 2019), and can occur cooperatively as well as collaboratively (Van Gasse et al, 2017):

My group didn't collaborate massively. I think collaboration was really useful in the initial stages; just about talking about the reading and talking about the research that we'd undertake in, and just discussing out loud what your ideas might be, and how you might approach it. I think that was really useful as it always is when you're coming up with a plan and just kind of brainstorming ideas, going: 'I read this bit', 'I picked this bit out', 'What do you think I might do?' And just- you know as of small group, making suggestions for each other professionally.

-Fiona

The above shows how collaboration played a part in the development stages, but that teachers' research then moved to a cooperative or individual phase. Dialogue is present throughout though, and this dialogue has a level of criticality, shown to heighten learning opportunities in CPD rather than discussion for relationship building (Van Gasse et al, 2017; Cain, 2019).

Elements of intelligent communities beyond collaboration were apparent:

So, if a school is… as it should be, a centre of continuous learning, well actually positive role modelling is at the heart of what we do, so actually that needs to come through on the pedagogy side as well

-Headmaster

[Schools] should be some of the centres producing research. Possibly even having a research department/position. Rather than just implementing research conducted at universities.

-Perry

Both examples touch upon the intellectual activity implied buy the term intelligent communities (Cain, 2019), and suggest that schools are centres for learning for all involved not just the pupils. Perry highlights how intelligent communities can become research produces as well as consumers, like the shift away from a linear to reciprocal relationship described by

Coldwell et al, (2017), and argues for roles to promote research, like research links and champions (Guilfoyle, 2020; Burn et al, 2021).

An exchange occurred where there was a pseudo-disagreement about what constituted collaboration:

I think that there is, potentially not collaboration, but this idea that we keep talking about- culture. And I think that's what I loved about this whole process the most is just talking about things outside of the classroom. It was like a breath of fresh air...
-Lisa

Lisa conceptualises the benefit of the LRG as instilling a culture to enthuse and motivate those involved, Lisa moves beyond collaboration and into intelligent communities in a broader sense. This is seen as distinct from collaboration, not interconnected, and this was picked up by Guy:

I think culture could be defined as institutionalised collaboration... I think that's what you want to strive towards developing; a common room which is obsessed with teaching better lessons, and becoming better teachers
-Guy

'Institutionalised collaboration' can be seen as a proxy for intelligent communities, which was not a term the teachers involved were familiar with, but one feels it would have been used to describe the essence of this exchange.

It seems the LRG laid the foundations for intelligent communities. All staff valued the opportunity to collaborate and engage in professional dialogue, consistent with what teachers most value about EIP and CPD (Bell et al, 2010). Some too, were able to articulate benefits of research engagement included in the definition of intelligent communities and suggest that a research-oriented culture was being created, necessary to foster research engagement (Hargreaves, 1995; BERA, 2014). That said, this is not a perfect model, and though it was beneficial to the teachers that volunteered, more needs to be done to instil the culture more widely and deeply.

Teacher Professionalism

Teacher professionalism included references to accountability, self-improvement, and improvements or changes in practice, with the justification that teacher professionalism would, like medicine and law involve teachers being up to date with research development and striving to improve their teaching (Goldacre, 2013).

This element of being *up to date* with research was seen as a reason for taking part in the LRG:

> *Seems like a nice way to work with teachers in other departments and improve my teaching. Staying in touch with research and applying that to the classroom instead of just slipping into what is comfortable.*
> *-Jess*

The reference to avoiding '*slipping into what is comfortable'* is seen as one of the benefits of EIP in the literature, what Cain (2019) describes as comfortable stasis, this can be seen as teacher professionalism, as research is seen to sharpen practice instead of relying on experience (Evidence Based Education, 2017).

Accountability was raised by two teachers, and this can be seen as form of teacher professionalism:

> *I have been held accountable to do more collaborative learning in class so I can feed back and contribute to the group. This has encouraged me to do more of the same, independent of the learning group.*
> *- Jess*

This example links with other features of the LRG, the group structure and collaboration. Cordingley et al (2015), suggested that having groups acts as a motivator, both in terms of support and in terms of negative reinforcement- not letting others down, which can be seen in Jess's comment.

The richest discussion regarding teacher professionalism came in the leadership interview and the following neatly encapsulates how EIP and the LRG contribute towards improved teacher professionalism:

> *...There's nothing better, I think than somebody having pride in their profession and, certainly from seeing, you know, the display that was put on show for the governors and the brochure that we've now got… That's a collection of contributions from people who have pride in their profession, and it will contribute to add pride to their profession as well.*
> *-Headmaster*

For this respondent, professional pride was important both to individuals involved, and added value as a sign (Brown et al 2021), encouraging others to take pride in their profession. In summary, teacher professionalism was a benefit of the LRG, with evidence of professional pride, accountability, and self-reflection and improvement.

Pupil Outcomes

This intervention focussed on improving teacher practice through engaging in research, rather than improving pupil outcomes. However, both teaching practice and pupil outcomes were at the forefront of teachers' minds when volunteering to the LRG, as seen in this example:

> *Because I feel the need to develop and learn and improve, for the good of the students*
> *-Penny*

Here Penny draws a link between CPD and pupil outcomes, this is consistent with closed questions (Figure 6) that teachers believed their ambitions to improve outcomes had been met, with 11/14 teachers agreeing their pupils benefited from their participation.

The main source of pupil's outcomes is though the learning research journal (Appendix C). Figure 13 below, is taken from the findings of the metacognition group. This group acted collaboratively, which perhaps led to more sophisticated research (Van Gasse et al, 2017) for

example, the varied skills of the group meant they were able to run complicated regressions, as seen below:

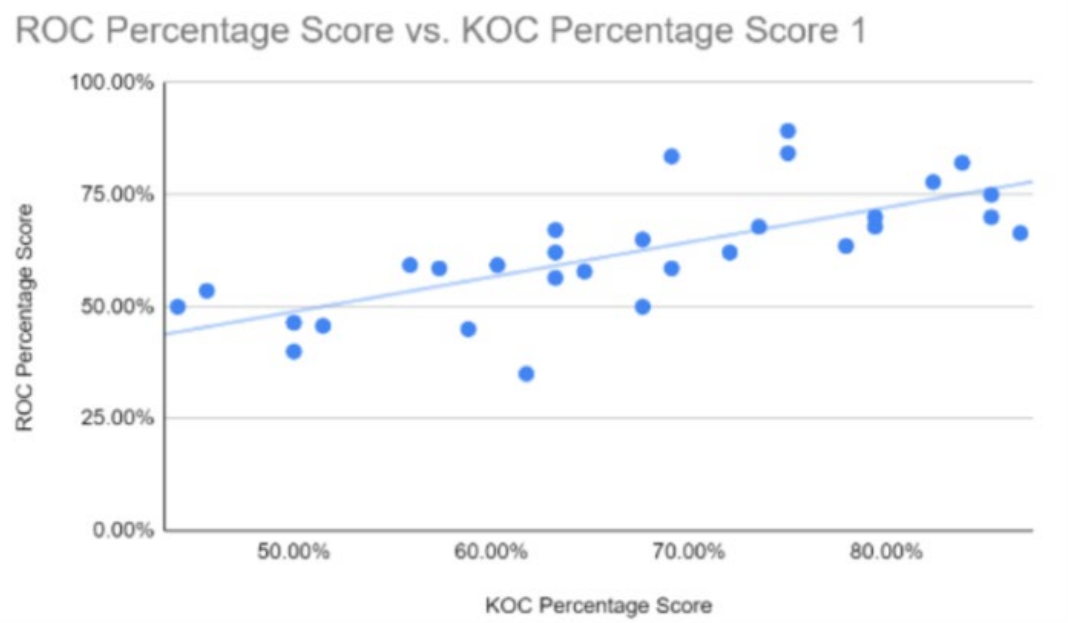


Figure 13. Graph taken from the findings of the metacognition article in the learning research journal.

The above shows the relationship between knowledge of cognition (KOC) and regulation of cognition (ROC) and the positive relationship found was shown to be significant. Though this cannot show causation, it does suggest knowledge of cognition could have a positive impact on pupil outcomes. This is an example of how engagement in research as CPD may impact pupils.

In another example, Lisa investigated *world-building* as an approach to improving recall in history. World building involves students integrating knowledge from lessons into a narrative. SL had created sentence starters to guide the narrative, but pupils had to create the rest of the story. They found:

> *...Students moving from an average of 7.6 to 8.7 out of 10... suggests that students going through the process of actually creating their world and immersing themselves by having to consider the historical narrative led to a better understanding of the topic and students' ability at recalling key information...*
>
> *-Lisa*

Lisa's findings demonstrate how small practitioner research can lead to interventions which can improve outcomes, not only does Lisa now have a new tool at their disposal, but they also have knowledge of how the subtleties of that design can have differing impacts.

As stated, it was not the focus of this project to show improved outcomes, but the potential to do so. The link between EIP and pupil outcomes warrants further exploration (Coldwell et al, 2017) but the LRG approach does seem to have the potential bring about changes in practice which affect pupil outcomes.

Barriers and Challenges

The LRG is not immune to drawbacks; and encounters the challenges cited by critics (Galdin-O'Shea 2015, Brown 2021; Arthur et al 2004; Wiggins, 2015). Some of these have been discussed, for example generalisability of research. Contrary to the literature, (Cain, 2017; Nelson and O'Beirne, 2014) this was never a large concern to the members of the LRG, nevertheless, their views improved on completion of the programme (Figures 9 and 10).

Accessibility issues were more consistent with criticisms found by many researchers (Williams and Coles, 2003; Goldacre, 2013; McIntyre, 2005) and teachers at the outset did not unanimously agree that research was accessible (Figure 9) however more thought it accessible than did not. This may be related to recent improvements in availability (EEF, 2017) or because these teachers already felt that research informed their practice.

The most prevalent criticisms of the LRG were time and workload, also present in literature (BERA, 2014; Bubb and Earley, 2009; Mitchel, 2013). In total more references to time and workload were made than all other criticisms combined. The examples below are common:

> *I have managed to evaluate the strategy I attempted but I was limited by time and other priorities to not be able to implement it as much as I would have liked...*
> *-Lisa*

This response features both time, and workload in the form of differing priorities and how Lisa felt it impacted on their ability to do justice to the project.

Time and workload are the hardest barriers to overcome, as all interventions inevitably take time (Cain, 2019), and increased pressures and varied responsibilities, particularly in a boarding environment, can make it impossible to provide. As Cain (2019) suggests, perhaps the only way to address the issue of time is to reframe it, to put CPD as a priority and make the most of dedicated, if not freed, time to engage in the research.

3. What is the school leadership's perception of a learning research group approach to CPD becoming a whole school practice?

It would be tempting to think that the benefits of the LRG becoming the standard approach to CPD in my college are self-evident. However, decision making occurs in a social context and is prone to internal and external pressures (Brown et al, 2018). The LRG can continue in its current form without issue, but to become a whole school approach would need the support of school leaders. (Cordingley et al, 2015; EEF, 2019, Robinson et al, 2009; Brown, 2017).

To analyse the views of leadership towards the LRG as CPD, Brown et al (2021) application of Baudrillard's (1968) theory of objects will be used, and the responses of the headmaster and deputy head academic will be assessed against: perceived benefits and costs of the LRG, and the value of the LRG as a sign

Perceived Benefits of the LRG

Four benefits arose from the thematic analysis of the leadership interview, these were: structural benefits, context specificity, teacher professionalism, and sharing best practice.

Structural Benefits

These include research engagement and elements of CPD. Research engagement in this sense was viewed positively, and all facets above can be seen in this exchange:

For me, it's an effective way of organising CPD in that it's impactful because it's led by teachers working in their context, it's a chance to share best practice, but it's a chance to consider what research works in your own school.

-John

Just off the back of that, for me it's, it's ownership, ownership of their own CPD. They can look at areas of interest for themselves.

-Headmaster

John introduces the relationship between EIP and CPD and uses the term *'organising CPD'.* This description harkens to research which describe the CPD landscape as comprehensive but incoherent (Coldwell et al, 2017; BERA, 2014; Cordingley, 2013). They also focus on impact and context, the features that teachers focussed on when volunteering to the LRG. The headmaster focusses on a different benefit; ownership and sees that teachers focussing on their own interests as beneficial, consistent with the literature which justified this design feature (Coe and Kime, 2021; Kraft and Papay, 2014; Klein, 2014.)

Context Specificity

Context specificity was referred to in the example above, and the headmaster too felt it important, and explored this in more detail

I think as senior leaders we've also got to see this, the research, and where we identify actually, where there's a gap in our current practice, that this might actually help... And also, it depends on the context of the school... if the starting point is based on the pupil context it's more

immediately applicable to our school, where if it's based on theory, there will be some school contexts, where arguably, it will have greater impact than others.

-Headmaster

In this example, the headmaster refers both to the ability to apply research to solve problems that are specific to the needs of the school, a recommended starting point in decision-making (Cain, 2019, Slavin, 2004; Tinsley, 2021) but also how research engagement that is focussed on the needs of the student is likely to have greater impact than general theory (Cordingley et al, 2015; Tinsley, 2021).

Teacher professionalism and sharing good practice

The headmaster saw sharing good practice as a benefit of the LRG, as seen in this example:

If they're champions who are respected... but then again, it's also an opportunity for, for people who one might make the mistake of underestimating- actually giving them a platform... which not only adds a layer to them but also adds a layer to the perception of them as a professional.

-Headmaster

This example contains an 'ah-ha' moment where the headmaster goes from seeing participation of respected members of staff in the LRG as driving credibility, to realisation that participation also drives the credibility of all those involves and contributes to developing the perception of teachers as professionals.

This also ties in with the advantage that the LRG creates a forum in which to share good practice, which can be seen in this example:

For me I think we've seen how it could, should work. I think we've had a group of committed teachers and I think they will get the opportunity to share their findings at inset in August which should shape teaching next year.

-John

In this example we see how the LRG can be used as CPD not only for those involved, but also the wider staff body in future CPD, this was then extended unexpectedly by the headmaster

...We should be able to share this research with other, with other educational establishments and maybe contribute to a bank of research which is up to date...

-Headmaster

This comment not only provides insights to the headmasters view of the LRG as a vehicle of sharing good practice, but also links to themes of intelligent communities, in providing a network of research, and indicates that the LRG does have some value as a sign, in that it can be presented outside of the college.

Value as a sign

The example above can be seen as the leaders of Riverside College valuing the LRG not only as CPD in my college, but also beyond it, this was made more explicit by the headmaster:

I think it's a way of, of reinforcing that Riverside College is a school which takes its pedagogy very seriously, but also, it's the right thing to do in terms of sharing best practice with other schools.

-Headmaster

This example is a much clearer statement that research engagement is valued both as a sign with marketing value, very much as Baudrillard (1968) conceptualises it, but also as a moral sign, that sharing research with other school contributes to teacher professionalism as well as raising the pedagogical status of my own school (Brown et al, 2021). This was echoed by the deputy head:

I couldn't agree more, I'd endorse that 100%. And over the years we've, sort of taken part in, ad hoc sessions with neighbouring schools, actually I'd love us to be the hosts... for other schools to see how much we value this work.

-John

There are two elements in this example which highlight the value of research as a sign, the reference to the mantle shifting from attending to hosting *'meets'*, and the comment near the end, that it would be good for *'other schools to see how much we value this work.'* It seems then that the value of research as a sign is met by the LRG.

Perceived Costs

Initially neither the headmaster nor deputy head were clear on what the costs of the LRG model might be, with the deputy head stating:

I think it should be very low cost because it's led by teachers, you're not inviting in an external speaker, expert, so it should be very low cost. ...but it should be a very low cost- high impact model.

-John

This was a literal interpretation of cost, which encouraged a reframing of the question. At this point, discussion moved away from financial costs, and more to workload, commitment, and ambition.

...You always think that you're going to come out with something which is unique, and there are very few original ideas out there. ... managing expectations that you're not going to suddenly reinvent the wheel by doing this, but it maybe just sharpens the tools that you're using in the classroom.

-Headmaster

This is similar to findings regarding changes in practice, in that teachers were more inclined to describe their practice as improved rather than changed.

Like the teachers involved in the LRG, time and workload were also perceived as a cost to school leaders:

There are always constraints on it because teachers are already subjected to very heavy workloads in their working day. Therefore, I think it really does require a commitment to being seen through... So, if it can be done in a structured way, with deadlines then, then yes… but I think the, the big challenge is time...

-Headmaster

This comment highlights both the problem and a solution. It acknowledges that time and workload are barriers to research engaged CPD, but these can be overcome with appropriate structures, like those in place in the LRG.

In summary, framed through Brown et al (2021) evaluation of EIP, it appears the costs of the LRG are outweighed by the benefits, and its value as a sign, summarised by the headmaster:

For me I think we should be committed to it because it demonstrates our commitment... to excellent teaching practice and to want to improve what we do. So, if a school is… as it should be, a centre of continuous learning, ...we've, got to demonstrate the commitment to that, so hence the learning research group that we've had here has, I hope had our wholehearted support throughout.

-Headmaster

The future of the LRG as a method of CPD is safe in its current format then, and the headmaster's comment implies that there is commitment to the LRG and that its growth into something bigger, and wider reaching would be supported.

DISCUSSION

This investigation aimed to understand if engaging teachers in research through learning research groups is an effective form of CPD. The findings above indicate the affirmative. Teachers report their engagement in the LRG has improved their practice, responses indicate that features of quality CPD and the goals of research engagement have been met, and the leadership of Riverside College see the value of this approach to CPD and would support its expansion.

The findings of this research are mostly consistent with the literature. Cordingly (2013) believes research engaged CPD can improve teaching practice and pupil outcomes. Similarly, Cain (2019) believes the long-term goals of research engagement are to improve pupil outcomes and teacher professionalism. My investigation, though not longitudinal, indicates these goals have in part been achieved.

There are findings in the learning research journal that changes in practice may have influenced changes in pupil performance, particularly in relation to metacognitive and recall strategies, supported in the literature (Rousseau and Gunia, 2016) However, it is reductionist to pin such changes on research engaged CPD alone, the relationship between CPD and pupil outcomes in not linear, and warrants further investigation (Coldwell et al, 2017; Brown et al, 2021). The teachers' interventions lasted around a term and changes in outcomes were small, to understand pupil impact the intervention would need to take place with a larger cohort for a longer period, but even this would demonstrate an area of research rather than teachers' engagement in research improved outcomes.

Clearer, is that research engagement did bring about real changes in teachers' practice; this finding is consistent with Cain (2019) and Cordingley et al (2015). Teacher mindset and decision making (Cain 2019) build toward improved pupil outcomes and teacher professionalism and are both benefits of research engaged CPD. Cain (2019) argues decision

making tends to be a slow process, not always seen in the classroom, where fast thinking is more important. It is through changing teacher mindsets that fast thinking is affected. References to decision making were less common in this investigation, though teachers did discuss how findings from their practitioner research would influence their planning for the next academic year. This was expected, as the intervention focussed on teacher CPD rather than policy or curriculum planning.

It was sometimes difficult to differentiate teacher mindset and decision making beyond the difference of its application. For example, when Lisa stated that their practice had not changed this year but would next year. This could be seen as decision making as the results have given weight to a new approach, but has Lisa's mindset or belief about the value of the approach not changed too? And this belief having been internalised will lead to changes in behaviour and decision making? (Eraut, 2004; Cain, 2019; Korthagen and Vasalos, 2005). This difficulty in distinction may be explained by the reciprocal relationship between research engagement, decision-making and mindset, with fast, in classroom, thinking (Kahneman, 2011) being affected by teacher mindset (Korthagen and Vasalos, 2005) which itself can be altered through research engagement (Cain, 2019). Indeed, there was evidence that teachers' attitudes to research engagement, though never negative, did improve through the course of the LRG which could have bought about the changes outlined above.

Findings regarding collaboration resonate with the literature (Cordingly et al 2015; Bell et al, 2010; OECD, 2019) and intelligent communities (Cain 2019; Van Gasse et al, 2017). Teachers valued the opportunity to collaborate from the beginning of the LRG and considered it among the most useful factors. Collaboration was both supportive (Cordingly, 2013) and a source of learning through discussion (Stoll et al, 2006). Collaborative approaches theoretically lead to greater criticality, resource sharing and sophisticated research and this was the case in this investigation. Most groups worked cooperatively, but the collaborative group (metacognition) produced a more complex and robust investigation (Appendix C).

Teachers discussed the contribution of the LRG to creating a research-oriented culture, and praised the benefits of open, professional dialogue and the sharing ideas, akin to the intelligent communities described by Cain (2019). For me this has been one of the chief benefits of the LRG. The LRG was implemented to overhaul a prior attempt to engage teachers in research that was scarcely attended, the LRG however suffered little attrition, despite lasting an academic year. There is a real sense in the teachers' responses that, despite the significant workload and time challenges, the LRG was a useful and enjoyable process consistent with the evidence regarding collaborative approaches to research engagement (Cordingley et al, 2015, Bell et al, 2010, Cain, 2019).

The design and administration of the LRG contributed to the outcomes described above, principally engaging *in* practitioner research and having ownership of the area of research. Cordingley et al (2015) outline that CPD is most effective when it involves features of research processes, including sustained enquiry, and the findings of this investigation corroborate this, indicating that teachers valued conducting their own research, and felt it had been applied in a way that improved their practice and benefited pupils. These benefits were also seen in the models described in the literature review (Fillingham, 2020; Tinsley, 2021). A further benefit of practitioner research was its localised nature. The LRG compared favourably against other types of CPD, and chief among the reasons for this was its ability to focus on the context of Riverside College and solve problems in this context rather than developing generalisable findings (Cain, 2019).

Ownership has less emphasis in the findings of Cain (2019), Cordingley (2013) and Brown et al (2021) but did feature in this investigation. Both Fillingham (2020) and Tinsley (2021) constrain freedom of choice in their research engagement approaches. Fillingham by having all teachers involved, and Tinsley by selecting teachers and their focus. My approach, with the exception of ECTs and PGCEs, was voluntary, and teachers had the choice of which group to join and could if desired investigate areas outside of these. This choice acted as a motivator for joining the LRG, and in the opinion of the leadership team gave teachers

ownership of their development which could further drive engagement from those taking part, and those yet to. As a long-term strategy, the voluntary nature is useful in promoting growth, but this may not be possible if Riverside College aims to engage all teachers in research, in which case a model which expects all teachers to be involved, and potentially links participation to appraisals may be appropriate (Cain, 2019; Fillingham, 2020).

The challenges of research engagement outlined in the research (Cain, 2019; Brown et al, 2018, Coldwell et al, 2017) were seen in the LRG, chiefly time, and workload, but teachers also recognised that having time earmarked for research engagement created the headspace to engage in research, consistent with Cain's (2019) suggestion, that time can only be overcome by reframing the issue. Unlike the literature (Cain, 2017; Nelson and O'Beirne, 2014), generalisability was not seen as a major issue to teachers, this was true from the outset and may be attributed to the growing availability of research (Guilfoyle, 2020; EEF, 2017, Cain, 2019). That this concern was lesser by the end, could indicate that engagement in research improved this mindset, particularly as practitioner research has the benefit of being context specific, a fact not lost on participants.

The application of the benefits, costs, and value as a sign to evaluate research engagement was a useful and valid lens (Brown et al, 2021). Teacher responses throughout the LRG made references to costs and benefits, and at times value as a sign, though this was mainly seen in school leaders. In the context of framing the growth of the LRG, potentially to be shared outside of Riverside College, value as a sign seemed to be a determining factor in signalling that Riverside College is a centre of learning.

Though these findings indicate engaging in the LRG does improve practice, it is worth noting that many of the participants were inclined to research engagement, with at least two having postgraduate qualifications. The different forms of engagement were varied (See Appendix D), and included external CPD, educational books, applications, and podcasts. Additionally, when asked the extent to which they agreed that research inform their practice, 12/15 of the participants agreed or strongly agreed, only one individual disagreed (Appendix D).

Despite this, the questions asked in surveys and interviews all directly reference participation in the LRG, so though the group may have been positively inclined to research, they still attribute benefit to their engagement in the LRG.

This approach to engage teachers in research as CPD has, in my context, been a successful one. It is however a case study of one approach to research engaged CPD, and stands alongside other similar models (Fillingham, 2020; Tinsley, 2021) of research engagement. All these models are seen as successful by their creators and share common structural features, these are sustained enquiry, practitioner research, a collaborative group structure (Cordingley et al, 2015). Similarly, these approaches share the same goals, to promote teacher development, professionalism, intelligent communities, and to improve pupil outcomes (Cain, 2019). The LRG therefore stands among the existing literature of such case studies, and contributes to our understanding of the common practical and aspirational features of research engagement as CPD. What my approach contributes that is unique, at least among these three, is a bottom-up approach. Though my role as Assistant Head of course creates a power dynamic, most participants volunteered and contributed to the development of the LRG. Though this may change, it does seem that a leadership supported, volunteer model is good starting point for similar programmes of practitioner research for CPD.

CONCLUSIONS

This investigation aimed to understand if engaging teachers in research through learning research groups is an effective form of CPD, and based on the findings in relation to the research questions, I argue that engaging in practitioner research through LRGs is a fruitful, context specific and practical approach to CPD.

1. Does engaging in research through learning research groups improve teachers' practice?

The evidence obtained suggests this question can be answered affirmatively. Teachers' practice did change, but more importantly *improved* through engaging in the LRG. Engaging *in* research formed an important part of this, though all forms of research engagement were perceived favorably. Moreover, perceptions of EIP improved across the course of the LRG suggesting that sustained engagement is indeed beneficial (Cordingley et al, 2015). There is also tentative reason to believe that participation in the LRG does contribute to the goals of improved pupil outcomes and teacher professionalism (Cain, 2019).

2. Is engaging in research through learning research groups a useful form of CPD?

The LRG did meet the criteria for quality CPD (Cordingley et al, 2015; Bell et al, 2010) and the benefits and goals of research engagement outlined by Cain (2019). In terms of design of the intervention, clear targets and tangible outcomes were seen as beneficial, and helped teachers to maintain sustained enquiry across two or more terms, considered a desirable feature of research engaged CPD (Cordingley et al, 2015).

Teachers had concerns that some educational research does not generalise well to the classroom, however, these had been allayed somewhat by the end of the LRG. There was some evidence that the LRG contributed to decision making, however the feature of teacher mindset was more relevant to this intervention as the LRG was classroom-based practitioner research. That said, teachers did refer to how their findings would change the way they approached their teaching in the future, indicating that research engagement had influenced their decision making and their repertoire contributing to their CPD.

The LRG has made the first steps in creating a research-oriented culture, which promotes intelligent communities. All staff valued the opportunity to collaborate and engage in

professional dialogue, consistent with what teachers most value about EIP and CPD (Bell et al, 2010), indeed working with others was seen as the most enjoyable and useful feature of the LRG.

Despite these strengths the LRG is not perfect and is arguably more time and labour intensive than other forms of CPD. These issues are practically difficult to overcome, but future planning of the LRG will try to consider the suggestion made by teachers to protect time where at all possible. In conclusion, drawing on the features outlined above, the LRG does meet the criteria to be considered a useful form of CPD.

3. What is the perception of a learning research group approach to CPD becoming a whole school practice by the school leadership?

The headmaster and deputy head academic saw considerable benefits of the LRG as a way of developing teacher practice and contributing to teacher professionalism (Cain, 2019). Few costs were perceived, but time was among them. Most encouragingly, both leaders saw research as having value as a sign and considered ways in which the college could be outward facing and could share this research with other institutions. It seems then that the future of the LRG as a method of CPD is safe in its current format, but that its growth into something bigger, and wider reaching would be supported. How this is achieved however, requires further exploration.

Collaboration

Central to the success of the LRG was collaboration, in terms of administration and implementation. The design of the LRG into small research groups was perceived as the most popular and useful feature of LRG. I had underestimated this, and having research groups was inspired through the MLT and for practicality as much as being based models in the literature. Though the learning research journal is impressive, more exciting were the discussions and

enthusiasm for the formation of a culture and forum for professional dialogue. I too benefited from this, and discussions with my supervisor, CF and all those involved in the LRG helped to evolve the LRG into what it became. Collaboration, which was in part practical, I now see, alongside practitioner research, as essential to the LRG.

Avenues for further research

Though I believe this approach has been effective, the teachers that volunteered were mostly research engaged and engaged in a range of CPD. I would like to see how this model could be grown to a wider audience, and potentially trial a model, like Fillingham's (2020), which requires that all teachers participate, but with a broader choice of topics. Moreover, there is a limited body of research conducted in independent schools (Fillingham, 2020). Though the demographic of my college is academically more like the state sector, the socio-economic background and associated factors pastorally and academically are different, and it would be useful to collaborate with other independent schools to create a body of research on which to draw and contribute to.

Professional Implications

The implications of this research in terms of my career have been profound. To apply the mindset model by Korthagen and Vasalos (2005), I would describe my identity and mission as having been affected. I am certainly more driven to see teachers engage in research and contribute to our understanding of teaching and learning than before.

I was inspired at the poster conference for the MLT that so many teachers were interested in this project, surprised at the scope of the LRG and the quality of the journal produced (Appendix C). Similarly, the response from the governors and the leadership of my college have encouraged me to pursue this further, and I hope to be able to grow the LRG not

only in my immediate context, but also locally, to surrounding schools and professional networks. To use another's words to conclude:

> *It would be a shame and it would be a real limitation of the potential impact of this [the LRG] if it was simply reserved for our common room,*
>
> *-Headmaster*

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APPENDIX A- LRG SCHEDULE AND ROLES

Roles and responsibilities

Assistant Head

- In collaboration with Deputy Head, identifies areas for development
- Supports group leads with planning sessions and finding suitable research
- Supports group leaders in design of 'interventions'
- Monitors the progress of the LRGs
- Help collate group's writeup and research journal

Group Leads

- Specialise in a research area
- Provide reading material for groups
- Lead one to two meetings per half term
- Facilitate the group in reflecting and discuss the reading
- Help group members design 'interventions'
- Monitors the progress of the group
- Help collate group's writeup

The initial meeting of group leads also agreed on reasonable expectations for members of their research groups:

Research Group Members

- Attend all group meetings
- Read and reflect on materials provided
- Trial 'interventions' in their classrooms
- Observe other members of their group

LRG Original Schedule

LRG Schedule

Sep/Oct

- Inset- introduce the proposed research group either linked to appraisal
- Meet potential group leads, train, and outline first meeting
- First meeting with research group- initial discussion and reading
- Reflection on readings further discussion
- Reflective peer observation session

Nov

- Self-Reflection task
- Observations between group members of LRG

Dec

- All group meeting- share research discussion between all groups
- Academic dinner

Jan

- Group leads present discussion so far at inset
- Intervention planning and further reading

Feb

- Progress checks on interventions

Mar

- Feedback and reflection on interventions
- Drafting and discussing key findings for articles
- Present findings at inset

Apr

- Reflection on work through the year
- Plan for poster conference

May

- Poster for staff and governors
- Final meeting reflecting on strengths and weaknesses of group

Adapted Schedule

LRG Schedule

Sep/Oct

- Inset- introduce the proposed research group either linked to appraisal
- Meet potential group leads, train, and outline first meeting
- First meeting with research group- initial discussion and reading
- Reflection on readings further discussion
- Reflective peer observation session

Nov/Dec

- Self-Reflection task
- Observations between group members of LRG

Jan

- Group leads present discussion so far at inset
- Intervention planning and further reading

Feb

- Progress checks on interventions

Mar

- Data Collection
- Academic Dinner

Apr

- WB 25th April Data Collection extension

May

- 2nd-7th May Data Collection Extension
- WB 9th May Share initial findings/ drafting write up
- 20th May Write up deadline
- WB 23rd May Reflection Meeting/ complete final questionnaire

June

- Poster conference
- Publish Journal

APPENDIX B- EXAMPLE QUESTIONNAIRES

1. Supervisor initial questionnaire
2. Group Member Initial Questionnaire
3. Group Member Mid-project questionnaire
4. Group Member End of project questionnaire

Learning Research Group Initial Questionnaire

Please complete this questionnaire to outline your current level of engagement with research and to share insights into what you are hoping to get out of participation in the learning research group.

The respondent's email (**null**) was recorded on submission of this form.

1. Email *

_____

2. Gender

Mark only one oval.

- ◯ Female
- ◯ Male
- ◯ Prefer not to say
- ◯ Other: _____

3. How many years have you been teaching?

Mark only one oval.

- ◯ 0-4
- ◯ 5-9
- ◯ 10-14
- ◯ 15+
- ◯ Prefer not to say

4. Which, if any, of the following sources do use to engage with educational research?

Check all that apply.

- [ ] I read the TES articles
- [ ] I have studied/am studying for a further qualification in educational matters (e.g. MA, MEd, MSc)
- [ ] I belong to a subject association and I engage with their work (e.g. Royal Society of Geography)
- [ ] I attend CPD courses on average once a year or more
- [ ] I watch educational videos online termly or more frequently (e.g. TED talks or MathHelp.com)
- [ ] I frequently listen to educational podcasts or others which feed into my subject specialism (only tick this box if it you listen at least termly)
- [ ] I engage with educational apps (eg Teacher Tap)
- [ ] I follow educationalists on twitter and engage in their recommended reading
- [ ] I read educational books
- [ ] None of the above
- [ ] Other: _____

5. How much do you agree with the following statement

Mark only one oval per row.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
Educational research informs my practice	◯	◯	◯	◯	◯
Educational research easily translates into the classroom	◯	◯	◯	◯	◯
Educational research is easy to access	◯	◯	◯	◯	◯

6. What are you most looking forward to about leading a learning research group?

Check all that apply.

- [ ] Working with others
- [ ] Learning new skills
- [ ] Developing my teaching
- [ ] Reading academic papers
- [ ] Carrying out my own research
- [ ] Developing self reflection
- [ ] Gaining evidence informed teaching
- [ ] Academic writing
- [ ] Sharing my knowlege
- [ ] None of the above
- [ ] Managing people
- [ ] Other: _____

7. If other, please specify

_____

_____

_____

_____

_____

8. What are you least looking forward to about leading a learning research group?

Check all that apply.

- [ ] Working with others
- [ ] Reading academic papers
- [ ] Carrying out my own research
- [ ] Changing the way I teach
- [ ] Acadmic writing
- [ ] None of the above
- [ ] Managing people
- [ ] Other: _____

9. If other, please specify

10. What do you think the role of educational research in schools should be?

11. Why are you taking part in the learning research group?

12. What are you hoping to gain from taking part in the learning research group?

This content is neither created nor endorsed by Google.

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Learning Research Group Initial Questionnaire

Please complete this questionnaire to outline your current level of engagement with research and to share insights into what you are hoping to get out of participation in the learning research group.

1. Gender

Mark only one oval.

- ◯ Female
- ◯ Male
- ◯ Prefer not to say
- ◯ Other: _____

2. How many years have you been teaching?

Mark only one oval.

- ◯ 0-4
- ◯ 5-9
- ◯ 10-14
- ◯ 15+
- ◯ Prefer not to say

3. Which, if any, of the following sources do use to engage with educational research?

Check all that apply.

- [ ] I read the TES articles
- [ ] I have studied/am studying for a further qualification in educational matters (e.g. MA, MEd, MSc)
- [ ] I belong to a subject association and I engage with their work (e.g. Royal Society of Geography)
- [ ] I attend CPD courses on average once a year or more
- [ ] I watch educational videos online termly or more frequently (e.g. TED talks or MathHelp.com)
- [ ] I frequently listen to educational podcasts or others which feed into my subject specialism (only tick this box if it you listen at least termly)
- [ ] I engage with educational apps (eg Teacher Tap)
- [ ] I follow educationalists on twitter and engage in their recommended reading
- [ ] I read educational books
- [ ] None of the above
- [ ] Other: _____

4. How much do you agree with the following statement

Mark only one oval per row.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
Educational research informs my practice	◯	◯	◯	◯	◯
Educational research easily translates into the classroom	◯	◯	◯	◯	◯
Educational research is easy to access	◯	◯	◯	◯	◯

5. What are you most looking forward to about taking part in the learning research group?

Check all that apply.

- [ ] Working with others
- [ ] Learning new skills
- [ ] Developing my teaching
- [ ] Reading academic papers
- [ ] Carrying out my own research
- [ ] Developing self reflection
- [ ] Gaining evidence informed teaching
- [ ] Academic writing
- [ ] None of the above
- [ ] Other: _____

6. If other, please specify

_____

_____

_____

_____

_____

7. What are you least looking forward to about taking part in the learning research group?

Check all that apply.

- [ ] Working with others
- [ ] Reading academic papers
- [ ] Carrying out my own research
- [ ] Changing the way I teach
- [ ] Acadmic writing
- [ ] None of the above
- [ ] Other: _____

8. If other, please specify

9. What do you think the role of educational research in schools should be?

10. Which research group have you signed up to?

Mark only one oval.

- Collaborative learning
- Metacognition and self regulated learning
- Memory and recall practise
- Neuroscience in the classroom

11. Why did you choose this research topic over the other choices?

12. Why are you taking part in the learning research group?

13. What are you hoping to gain from taking part in the learning research group?

This content is neither created nor endorsed by Google.

Google Forms

Learning Research Group Mid Project Questionnaire

Please complete this questionnaire to outline your current level of engagement with research and to share insights into what you may or may not havegained from participation in the learning research group.

The respondent's email (**null**) was recorded on submission of this form.

* Required

1. Email *

_____

2. Gender *

Mark only one oval.

- ◯ Female
- ◯ Male
- ◯ Prefer not to say
- ◯ Other: _____

3. How many years have you been teaching? *

Mark only one oval.

- ◯ 0-4
- ◯ 5-9
- ◯ 10-14
- ◯ 15+
- ◯ Prefer not to say

4. Which research group are you signed up to? *

Mark only one oval.

- Collaborative learning
- Metacognition and self regulated learning
- Memory and recall practise
- Neuroscience in the classroom

5. Are you pleased with your choice of research group? (Your answers are confidential) *

Mark only one oval.

- Yes
- Mostly
- Partly
- No
- Prefer not to say

6. Which, if any, of the following sources do use/ are you using to engage with educational research? *

Check all that apply.

- [ ] I read the TES articles
- [ ] I have studied/am studying for a further qualification in educational matters (e.g. MA, MEd, MSc)
- [ ] I belong to a subject association and I engage with their work (e.g. Royal Society of Geography)
- [ ] I attend CPD courses on average once a year or more
- [ ] I watch educational videos online termly or more frequently (e.g. TED talks or MathHelp.com)
- [ ] I frequently listen to educational podcasts or others which feed into my subject specialism (only tick this box if it you listen at least termly)
- [ ] I engage with educational apps (eg Teacher Tap)
- [ ] I follow educationalists on twitter and engage in their recommended reading
- [ ] I read educational books
- [ ] None of the above
- [ ] Other: _____

7. How much do you agree with the following statements? *

Mark only one oval per row.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
Educational research informs my practice	◯	◯	◯	◯	◯
Educational research easily translates into the classroom	◯	◯	◯	◯	◯
Educational research is easy to access	◯	◯	◯	◯	◯

8. What have been the most useful factors you have experienced by taking part in the learning research group? *

Check all that apply.

- [ ] Working with others
- [ ] Learning new skills
- [ ] Developing my teaching
- [ ] Reading academic papers
- [ ] Carrying out my own research
- [ ] Developing self reflection
- [ ] Gaining evidence informed teaching
- [ ] Academic writing
- [ ] None of the above
- [ ] Changing the way I teach
- [ ] Other: _____

9. What have you found the least useful factors from taking part in the learning research group? *

Check all that apply.

- [ ] Working with others
- [ ] Reading academic papers
- [ ] Carrying out my own research
- [ ] Changing the way I teach
- [ ] Acadmic writing
- [ ] None of the above
- [ ] Other: _____

10. What have been the most enjoyable factors you have experienced by taking part in the learning research group? *

Check all that apply.

- [ ] Working with others
- [ ] Learning new skills
- [ ] Developing my teaching
- [ ] Reading academic papers
- [ ] Carrying out my own research
- [ ] Developing self reflection
- [ ] Gaining evidence informed teaching
- [ ] Academic writing
- [ ] None of the above
- [ ] Changing the way I teach
- [ ] Other: _____

11. What have been the least enjoyable factors you have experienced by taking part in the learning research group? *

Check all that apply.

- [ ] Working with others
- [ ] Learning new skills
- [ ] Developing my teaching
- [ ] Reading academic papers
- [ ] Carrying out my own research
- [ ] Developing self reflection
- [ ] Gaining evidence informed teaching
- [ ] Academic writing
- [ ] None of the above
- [ ] Changing the way I teach
- [ ] Other: _____

12. What do you think the role of educational research in schools should be?

13. How much do you agree with the following statement *

Mark only one oval per row.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
The demands of taking part in the learning research group are manageable					
Participation in the learning research group has improved my practice					
I am satisfied with the administration of the learning research groups					
I have applied research in a way that has improved my practice					
My pupils have benefitted from my participation in the learning research group					
Reading educational research has given me new ideas					
Reading education research has improved my practise					

Reading education research has reassured me of my teaching practice					
The expectation of taking part in the learning research group have been clear					
I have learnt new research skills from being part of the elarning research group					
The learning research group has been useful CPD					
Participation in the elarning research group has made me confident to try new ideas					

14. Have you gained what you had hoped to by taking part in the learning research group? *

15. Would you take part in the learning research group again? *

Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Not sure
- ◯ Prefer not to say
- ◯ Other: _____

16. Do you believe that the members of the group have benefitted from taking part? *

Mark only one oval.

- ◯ Yes
- ◯ Mostly
- ◯ Partly
- ◯ Unsure
- ◯ No

17. Please explain your answer in response to the above using examples *

_____

_____

_____

_____

_____

18. What could be done to improve the learning research group process in future? *

19. Please provide any comments about the learning research group you do not feel you have been able to in this questionnaire

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Learning Research Group End of Project Questionnaire

Please complete this questionnaire to outline your experience with the Learning Research Group and to share insights into what you may or may not have gained from participation in the learning research group.

The respondent's email (**null**) was recorded on submission of this form.

* Required

1. Email *

_____

2. Gender *

Mark only one oval.

- ◯ Female
- ◯ Male
- ◯ Prefer not to say
- ◯ Other: _____

3. How many years have you been teaching? *

Mark only one oval.

- ◯ 0-4
- ◯ 5-9
- ◯ 10-14
- ◯ 15+
- ◯ Prefer not to say

4. Which research group are you signed up to? *

Mark only one oval.

- Collaborative learning
- Metacognition and self regulated learning
- Memory and recall practise
- Neuroscience in the classroom

5. Are you pleased with your choice of research group? (Your answers are confidential) *

Mark only one oval.

- Yes
- Mostly
- Partly
- No
- Prefer not to say

6. Which, if any, of the following sources do use/ are you using to engage with educational research? *

Check all that apply.

- [ ] I read the TES articles
- [ ] I have studied/am studying for a further qualification in educational matters (e.g. MA, MEd, MSc)
- [ ] I belong to a subject association and I engage with their work (e.g. Royal Society of Geography)
- [ ] I attend CPD courses on average once a year or more
- [ ] I watch educational videos online termly or more frequently (e.g. TED talks or MathHelp.com)
- [ ] I frequently listen to educational podcasts or others which feed into my subject specialism (only tick this box if it you listen at least termly)
- [ ] I engage with educational apps (eg Teacher Tap)
- [ ] I follow educationalists on twitter and engage in their recommended reading
- [ ] I read educational books
- [ ] None of the above
- [ ] Other: _____

7. How much do you agree with the following statements? *

Mark only one oval per row.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly Disagree
Educational research informs my practice	◯	◯	◯	◯	◯
Educational research easily translates into the classroom	◯	◯	◯	◯	◯
Educational research is easy to access	◯	◯	◯	◯	◯

8. Has your view on the role of educational research in schools changed, if so, how? *

9. Has your practice changed as a result of taking part in the learning research group? *

Mark only one oval.

- Yes
- Mostly
- Partly
- Unsure
- No

10. Please explain your answer to the above using specific and detialed examples *

11. If your practise has changed as a result of participating in the Learning Research Group, has the change in been an improvement? *

Mark only one oval.

- ◯ Yes
- ◯ No
- ◯ Maybe
- ◯ NA

12. How much do you agree with the following statement *

Mark only one oval per row.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I have learned more from taking part in the Learning Research Group than other forms of CPD	◯	◯	◯	◯	◯

13. Please explain your answer to the question above with detailed and specific examples. *

14. Have you gained what you had hoped to by taking part in the learning research group? *

Mark only one oval.

- ◯ Yes
- ◯ Mostly
- ◯ Partly
- ◯ Unsure
- ◯ No

15. Please explain your answer to the question above with detailed and specific examples. *

_____

_____

_____

_____

_____

16. What have been the most useful factors you have experienced by taking part in the learning research group? *

Check all that apply.

- ☐ Working with others
- ☐ Learning new skills
- ☐ Developing my teaching
- ☐ Reading academic papers
- ☐ Carrying out my own research
- ☐ Developing self reflection
- ☐ Gaining evidence informed teaching
- ☐ Academic writing
- ☐ None of the above
- ☐ Changing the way I teach
- ☐ Other: _____

17. What have been the most enjoyable factors you have experienced by taking part in the learning research group? *

Check all that apply.

- [ ] Working with others
- [ ] Learning new skills
- [ ] Developing my teaching
- [ ] Reading academic papers
- [ ] Carrying out my own research
- [ ] Developing self reflection
- [ ] Gaining evidence informed teaching
- [ ] Academic writing
- [ ] None of the above
- [ ] Changing the way I teach
- [ ] Other: _____

18. Please detail any highlights of taking part in the Learning Research Group

_____

_____

_____

_____

_____

19. What have you found the least useful factors from taking part in the learning research group? *

Check all that apply.

- [ ] Working with others
- [ ] Reading academic papers
- [ ] Carrying out my own research
- [ ] Changing the way I teach
- [ ] Acadmic writing
- [ ] None of the above
- [ ] Other: _____

20. What have been the least enjoyable factors you have experienced by taking part in the learning research group? *

Check all that apply.

- [ ] Working with others
- [ ] Learning new skills
- [ ] Developing my teaching
- [ ] Reading academic papers
- [ ] Carrying out my own research
- [ ] Developing self reflection
- [ ] Gaining evidence informed teaching
- [ ] Academic writing
- [ ] None of the above
- [ ] Changing the way I teach
- [ ] Other: _____

21. Please detail any challenges participation in the Learning Research Group has presented

_____

_____

_____

_____

_____

22. How much do you agree with the following statement *

Mark only one oval per row.

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
The demands of taking part in the learning research group have been manageable					
Participation in the learning research group has improved my practice					
I am satisfied with the administration of the learning research groups					
I have applied research in a way that has improved my practice					
My pupils have benefitted from my participation in the learning research group					
Reading educational research has given me new ideas					
Reading education research has improved my practise					

Reading education research has reassured me of my teaching practice					
The expectation of taking part in the learning research group have been clear					
I have learnt new research skills from being part of the elarning research group					
The learning research group has been useful CPD					
Participation in the elarning research group has made me confident to try new ideas					

23. Would you take part in the learning research group again? *

Mark only one oval.

- Yes
- No
- Not sure
- Prefer not to say
- Other: _____

24. What could be done to improve the learning research group process in future? *

25. Please provide any comments about the learning research group you do not feel you have been able to in this questionnaire

26. Would you be willing to take part in a group interview to share your experienced of the Learning Research Group *

Mark only one oval.

- Yes
- No

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APPENDIX C-LEARNING RESEARCH JOURNAL

Names have been redacted and photographs removed.

LEARNING RESEARCH JOURNAL

ISSUE 1 2021/2022

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Letter from the Editor

It is with enormous pride that I present to you the inaugural Learning Research Journal. This document is testament to the hard work and dedication of our colleagues, who in addition to the many and varied roles they undertake, have found the time to investigate their own practise and share their findings with us.

All members of the learning research group signed up to one of four groups: Collaborative Learning, Metacognition, Neuroscience in the classroom or Memory and Recall. Through the year these groups have met to discuss research in these fields, applied research to their classes and contexts, observed each others attempts, and carried out and reported on their own interventions.

I would like to extend my heartfelt thanks to the group leads for all of the work that went on behind the scenes, in searching for research and adapting a timeline, to the changing demands of the year and the commitments of their members. I should also like to thank all those who took part and found the time to pilot this approach to CPD and for completing all of my questionnaires for my own research.

I hope you enjoy reading this first issue,

Yours sincerely,

S

Building Independent and Reflective Learners: Will Explicit Instruction of Metacognitive Skills Increase Pupils' Metacognition?

ABSTRACT

The Seven aims to develop pupils' key qualities in order to support academic success and to empower for the life after school, as university students and professionals. Committed to our teaching and learning framework, our study explored metacognition as a strategy to augment our curriculum and empower our pupils to develop essential skills in the 21st century. We conducted extensive literature research prior to implementing a small scale intervention over four weeks in the second half of the Spring term. Five teachers and 36 students in years 9, 11 and 13 took part; albeit this study will report on the quantitative data collected from 27 students who responded to both questionnaires, before and after the intervention. Our data tentatively indicate that explicit instruction most likely had a positive impact on our students' levels of metacognitive awareness. Nevertheless, the limitations of our short-term study mean that one can consider the findings as being descriptive; not confidently establishing a causal relationship.

Introduction

What is Metacognition?

Based on its etymology, metacognition is the ability to go "beyond" (meta) the "act of learning" (cognition). The simplest definition of metacognition is **"thinking about thinking"**.

In the 2018 Guidance Report by the Education Endowment Foundation (EEF), Chief Executive Sir Kevan Collins, defines metacognition as: 'On a very basic level, it's about **students' ability to monitor, direct, and review their learning.** Effective metacognitive strategies get learners to think about their own learning more explicitly, usually by teaching them to set goals and monitor and evaluate their own academic progress.

Essentially, metacognition involves two simultaneous levels of thought:

Knowledge about cognition corresponds to what students know about themselves, strategies, and conditions under which strategies are most useful. Declarative, procedural, and conditional knowledge can be thought of as the building blocks of conceptual (content) knowledge.

Regulation of cognition corresponds to knowledge about the way students plan, implement strategies, monitor, correct comprehension errors, and evaluate their learning. When students regulate, they are continually developing and monitoring their learning strategies based on their evolving self-knowledge.

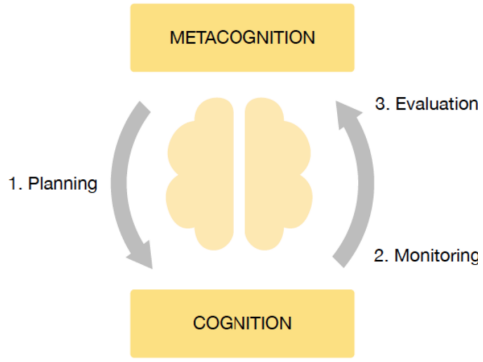
Why is Metacognition important?

The EEF Guidance Teaching and Learning Toolkit tells us that, based on extensive research evidence, encouraging secondary pupils to use metacognitive strategies results in an additional seven months of progress over the course of a year. It is a high-impact intervention for very low cost.



Strong metacognitive skills have the power to impact student learning and performance. They can help students to transfer what they have learnt from previous tasks to a new task or to a different context.

Research suggests that if we want our pupils to develop to be truly independent and reflective, they should be encouraged to think about their learning as an ongoing cycle, moving between planning, monitoring and evaluation.



1. **Plan effectively** - Did the strategies I used allow me to plan my learning effectively?
2. **Monitor learning** - Do the strategies I am using allow me to learn efficiently?
3. **Evaluate ability** - Have the strategies I used allowed me to learn the content to the best of my ability?

EEF(2018, p.10)

Pupils often find it challenging to employ effective study strategies. This is why it is important that teachers take the time to evaluate their pupils' understanding of the learning process, as well as to guide them to adopt methods that will optimise their learning. David Perkins (1992) defined four levels of metacognitive learners. It is a useful framework to consider, as we can tailor our support once we know what level our students are on.

Tacit learners are unaware of their metacognitive knowledge. They do not think about any particular strategies for learning and merely accept if they know something or not.

Aware learners know about some of the kinds of thinking that they do such as generating ideas, finding evidence etc. However, thinking is not necessarily deliberate or planned.

Strategic learners organise their thinking by using problem-solving, grouping and classifying, evidence-seeking and decision-making etc. They know and apply the strategies that help them learn.

Reflective learners are not only strategic about their thinking but they also reflect upon their learning while it is happening, considering the success or not of any strategies they are using and then revising them as appropriate.

Metacognition and SEN

In the EEF guidance report on special educational needs in mainstream schools (2020), **cognitive and metacognitive strategies were identified as being one of the most effective strategies for pupils with SEN.** They may help learners to develop an understanding of how their mind works, regulate their thinking and performance, and compensate for poor working memory, organisation or time management issues.

Metacognition and gifted pupils

Exceptionally able pupils generally have higher levels of metacognititve skills than their peers. Yet, research suggests that they will also benefit from improving their ability to monitor and reflect on their learning. This becomes more important while preparing to face the challenges of GCSE or A level exams.

Research Question:

Will explicit instruction of metacognitive skills increase pupils' metacognition?

Research hypotheses:

1. Pupils with higher levels of Knowledge of Cognition may have higher levels of Regulation of Cognition.
2. Older pupils may have higher levels of metacognitive skills.
3. SEN pupils may have lower levels of metacognitive skills

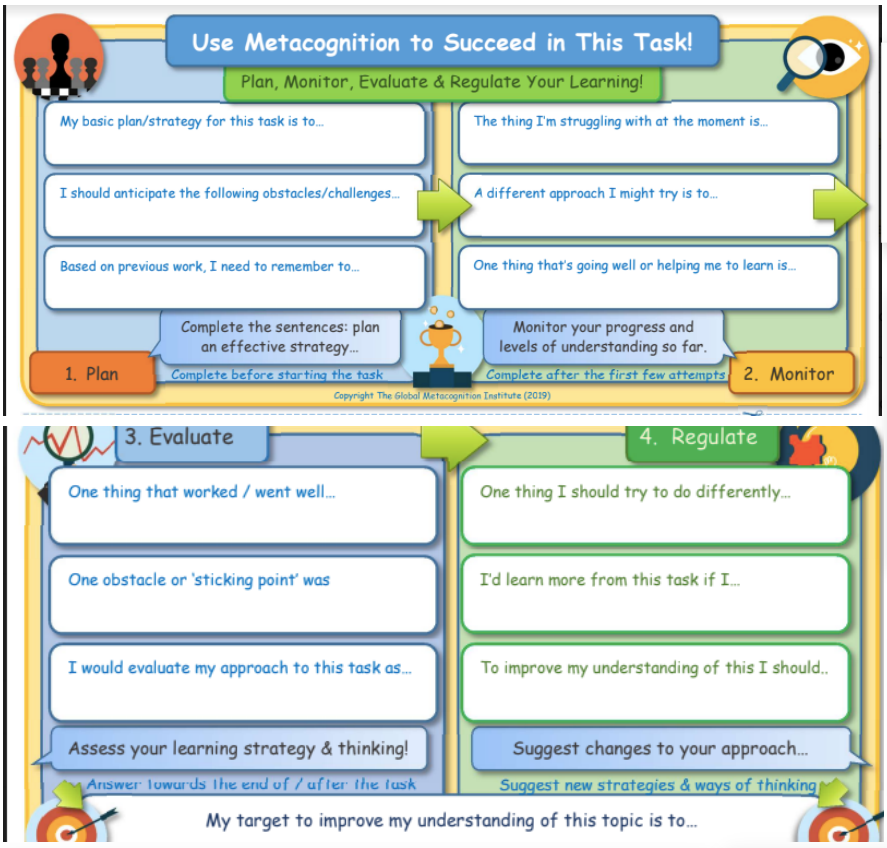
The Intervention

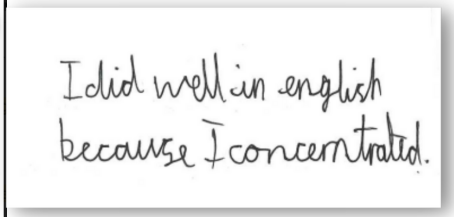
After our initial discussions on whom our target cohort should be, it was agreed to focus on our tutees; they are in years 9, 11 and 13, all marking education milestones. In this way, rather than investigating the metacognitive skills that can be applied on our individual subject areas, we could assess our tutees' metacognitive awareness and research strategies useful in all areas of the curriculum. Nathan Burns (2021) argues that a metacognitive tutor programme arguably benefits pupils by upskilling them outside of their subject lessons.

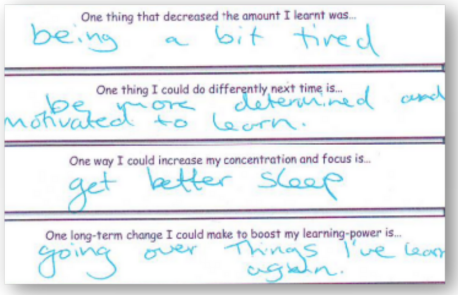
Our tutees completed the first Metacognitive Awareness Inventory (MAI) before February half-term, allowing us time to examine their responses closely before the intervention sessions started in March 2022. The data informed the planning of our interventions and the content of the designated Tutor Time sessions over four weeks.

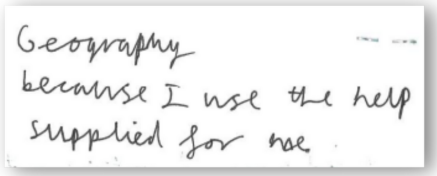
Some resources were shared amongst us but we also used resources tailored to our tutees' individual needs. For instance, all groups had extensive discussions on the importance of Planning, Monitoring, Evaluating and Regulating phases on their learning. The pupils were presented with a laminated card by The Global Metacognition Institute. It included guidance questions for each stage and they were actively encouraged to use it when completing a task or an assessment.

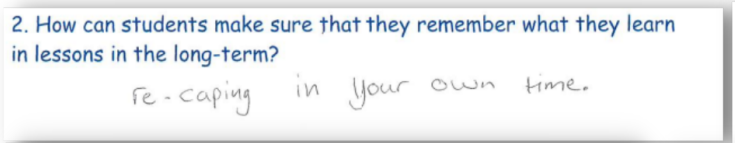
We aimed to raise awareness on the importance of metacognition by engaging our tutees in discussions about their learning strategies and the factors that could potentially have a positive or negative impact on their learning. We used 'think-pair-share' discussions and mini -worksheets to encourage our tutees to reflect on their learning power and set themselves clear targets for progress.

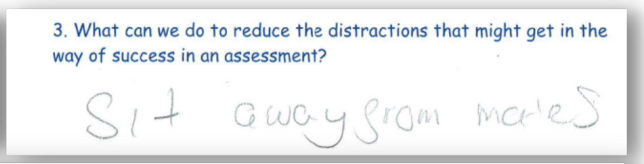


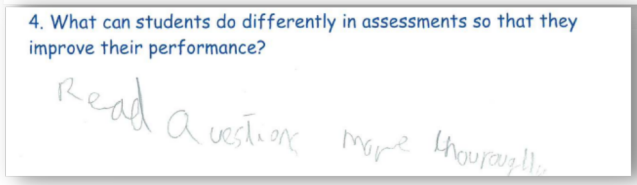


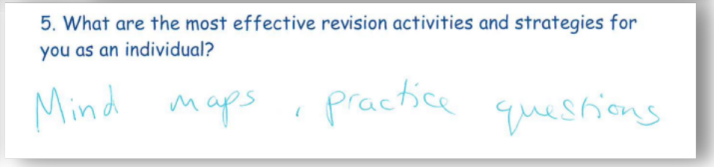












Mr J(Year 9)

The idea of the project was to raise awareness of metacognition and to develop the pupils' ability to 'learn to think'. Based on my reading, I was very keen to demystify and model the process of thinking, providing pupils with scaffolding and a model that they could use across their subjects.

Looking at the group's average scores for each question, there were three clear areas that I identified that I wished to explore with the group (i.e. the average scores were low suggesting that pupils' skills in these areas required development):
- Declarative Knowledge "I am good at remembering information"
- Procedural Knowledge "I have a specific purpose for each strategy I use"
- Conditional Knowledge "I can motivate myself to learn when I need to"

The sessions themselves involved short teacher presentations introducing the main ideas and concepts, some examples of frameworks for thinking and plenty of discussion and pupil reflection. As a result, we touched upon some wider issues that the pupils were facing, including sleep, hygiene, and the importance of organisation. In addition, we practised the metacognitive thinking involved in planning an essay, baking a cake and taking a conversion in rugby.

Ms P(Year 9)

When considering the average scores for my group the main area for development emerged as Declarative Knowledge. The low average score (below 3) for the statement "I am good at remembering information" highlighted the necessity to explore metacognitive skills to develop memory. I researched the value of quizzing in educational psychology and found it to be highlighted as beneficial. "The process of retrieval – bringing the information to mind – actually leads to learning all by itself. What is more, bringing the information to mind can sometimes improve students' ability to apply the information in new situations (Smith et al, 2016).

Subsequently in our first tutor session we explored ways in which quizzing helps pupils to retrieve information and leads to mastery. My tutees took an aspect from their recent learning (History facts on World War II battles) and produced a quiz in order to identify what they did and did not know. After undertaking the quiz in pairs they not only had a better idea of how well they had grasped the original facts but were motivated to find that when we revisited the quiz in the next tutor session in 3 days, they remembered a lot more material than after the initial read-through of their notes. The pupils overwhelmingly agreed that quizzing was a motivating way to learn and master new material that they could apply in exam preparation.

A further question in which all my tutees featured low scores (below 3) was regarding Comprehension Monitoring- "I find myself analysing the usefulness of strategies while I study". This prompted me to discuss within our tutor group how they think and approach certain academic challenges. We started the third session with these 2 simple reflective questions on a forthcoming science assessment:

- What do I already know that can help me be successful?
- What do I need to do that can help me reach my goals.

Following this discussion and focusing on the common objective of improving their scores, pupils then set themselves individual subject-specific learning targets and shared them with peers. Effective examples of these include:

- Identify/highlight the questions which are worth most marks and spend more time on them in tests.
- Make a list of key scientific terms with definitions and make sure I use them in my answers.

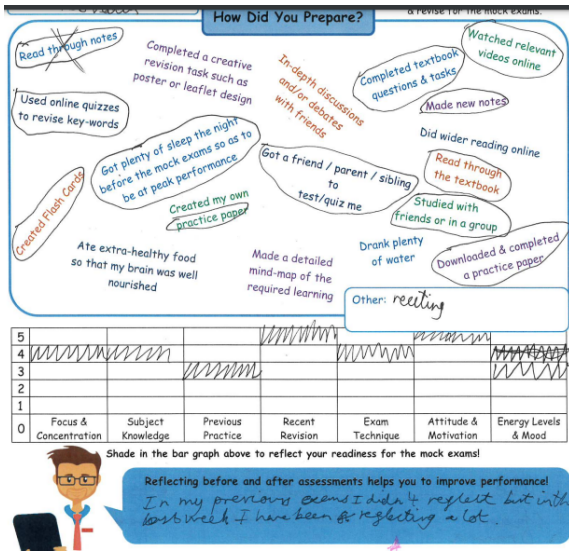
Ms PE (Year 11)

As the research group's lead, I had small group discussions with the two Y9 tutor groups. The aim was to encourage them to reflect on their attitudes to learning, identify possible obstacles to progress and what changes they need to make in order to improve their performance. Pupils identified as barriers to learning: lack of energy / feeling tired, Fortnite and distraction from peers. The first step to solve a problem is to recognise that there is one. This is why it was positive to hear that they aimed 'to get better sleep' and try 'not to get distracted' in lessons.

My Y11 intervention took place immediately after their mock exams in February. This timing proved to be significant as I was able to discuss revision strategies, as well as encourage reflection and goal setting ahead of their GCSE exams. In addition to the discussion and the resources throughout this report, the importance of 'exam wrappers' as effective reflection worksheets should be highlighted. Their ultimate aim is to help students improve by identifying what went wrong and what changes they should make in order to make better progress.

For the purposes of this study, a mock exams wrapper by The Global Metacognition Institute was adapted. It soon became evident that the pupils who applied better and more varied learning strategies (cognition of learning) were indeed more able to regulate their learning. Importantly, their grades were higher and they were more motivated to succeed.





Mr G and Mr P (Year 13)

As academic tutors to the pupils, looking into how they organised and prepared themselves for lessons or assessments was certainly enlightening. We appreciated that application of teaching in a sporting context can make subject matters more relatable as pupils tend to be more interested in the subject matter. (Morton, 2022).

Initially, it was surprising to learn that most pupils will not plan any work before starting it. Questions relating to planning for sport, such as the required preparation for upcoming fixtures, can be mostly applied to that of academic work. Failure to prepare better than the other team will result in failure to succeed. This is an important element to help pupils understand the impact of not preparing for their upcoming 'tests'. Many pupils found that they did not often consider what was going well until after the assessment or test. The awareness of what was working and what wasn't, was not something they had considered. One pupil spoke of how he just goes 'into a trance' and can often not recall anything from an assessment or a written essay.

The overarching theme was that as soon as an assessment or test is over, they do not like to think about it and due to the busy nature of school they aren't afforded time to reflect effectively. Pupils found the parity between premier league football teams preparing for upcoming fixtures and how it would be foolish not to consider what had gone badly in their last match. Our discussions highlighted that reviewing is a key part of identifying what changes need to be made in order to be better next time.

METHOD

Identifying the right method to measure metacognition was one of the first challenges our group faced. We soon realised that metacognition is a complex mental process; one that it is notoriously difficult to measure (Fleming and Lau, 2014).

Metacognitive development can be assessed via quantitative or qualitative measures. Quantitative measures include self-report measures, often using Likert-style survey instruments, while qualitative measures use coding of responses to open-ended prompts. A mixed method approach would arguably allow for a more thorough and triangulated investigation. Nevertheless, this is a laborious exercise and we decided to adopt a quantitative research design; being time efficient and practically feasible. In addition, it is a suitable and credible way to test hypotheses and describe correlations.

Sample

Although we adopted a convenience sampling method, the focus groups are representative of the College's population. Our tutor groups are mixed ability cohorts in years 9, 11 and 13. They total 36 students, of whom 25 students (69,44%) have either a Specific Learning Difference (SpLD) diagnosed or there is a requirement for exam access arrangements.

Due to various factors, 27 pupils, of whom 20 are SEN, responded to the questionnaires before and after the intervention. To validate our study, we report only on the results collected from both questionnaires. Nevertheless, all the responses were useful for us to understand our tutees' awareness of their metacognitive skills and have a clearer picture as to what areas we should focus on.

Materials

The second challenge we faced was to identify a means of credible baseline testing to assess our tutees' metacognitive skills. We chose to use the **Metacognitive Awareness Inventory** (MAI), an instrument designed to assess the levels of metacognitive awareness and foster metacognitive reflection. Developed by Schraw and Dennison (1994), it has 52 statements that are classified by type of cognitive knowledge: declarative (DK), procedural (PK), and conditional (CK); or by specific metacognitive process: planning (P), information management strategies (IMS), monitoring (M), debugging strategies (DS), and evaluation (E).

KNOWLEDGE ABOUT COGNITION

DECLARATIVE KNOWLEDGE		DECLARATIVE KNOWLEDGE	SCORE
• The factual knowledge the learner needs before being able to process or use critical thinking related to the topic • Knowing *about, what, or that* • Knowledge of one's skills, intellectual resources, and abilities as a learner • Students can obtain knowledge through presentations, demonstrations, discussions PROCEDURAL KNOWLEDGE • The application of knowledge for the purposes of completing a procedure or process • Knowledge about *how* to implement learning procedures (e.g., strategies) • Requires students know the process as well as when to apply process in various situations • Students can obtain knowledge through discovery, cooperative learning, and problem solving CONDITIONAL KNOWLEDGE • The determination under what circumstances specific processes or skills should transfer • Knowledge about *when* and *why* to use learning procedures • Application of declarative and procedural knowledge with certain conditions presented • Students can obtain knowledge through simulation		5. I understand my intellectual strengths and weaknesses.	
		10. I know what kind of information is most important to learn.	
		12. I am good at organizing information.	
		16. I know what the teacher expects me to learn.	
		17. I am good at remembering information.	
		20. I have control over how well I learn.	
		32. I am a good judge of how well I understand something.	
		46. I learn more when I am interested in the topic.	
		TOTAL	8

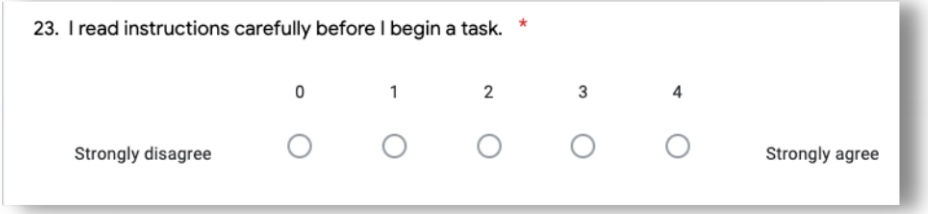
PROCEDURAL KNOWLEDGE	SCORE	CONDITIONAL KNOWLEDGE	SCORE
3. I try to use strategies that have worked in the past.		15. I learn best when I know something about the topic.	
14. I have a specific purpose for each strategy I use.		18. I use different learning strategies depending on the situation.	
27. I am aware of what strategies I use when I study.		26. I can motivate myself to learn when I need to.	
33. I find myself using helpful learning strategies automatically.		29. I use my intellectual strengths to compensate for my weaknesses.	
		35. I know when each strategy I use will be most effective.	
TOTAL	4	TOTAL	5

MAI is credible and widely used in research to conduct pre- and post-tests to assess growth due to metacognitive instruction. Pintrich (2000) agrees the MAI has external validity given MAI scores and students' academic achievement are highly correlated.

Following a group discussion, we decided that the limitation of this test could be its basic restrictive 'yes or no' answer. A simply agreeing or disagreeing response would not give our tutees the flexibility to accurately self-report how often they may exhibit these bahaviours; allowing us to more easily assess potential post-intervention changes.

As a result, we revised the MAI to a 5 point likert scale; ranging from strongly disagree (zero) to strongly agree (four). In order to be able to process the data in an efficient way, the MAI was transferred to two Google forms, assessing 'Knowledge of Cognition' and 'Regulation of Cognition'.

(example)



Then, from each section we were able to have a mean average score, which allowed us to rank our pupils and their metacognitive skills.

As discussed earlier, the results from the pre-intervention MAI helped us to identify some key areas for our intervention. Importantly, they also showed moderately strong positive correlational evidence that pupils with greater knowledge of cognition were also better at regulating their own knowledge.

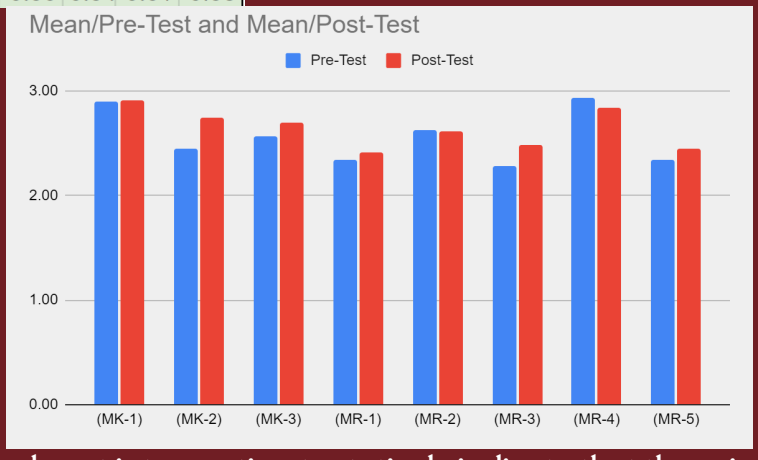
Following the short-term intervention, our tutees were invited to complete the MAI for a second time in order to assess the impact. The results are presented and discussed in the next section.

RESULTS

Research Question:

Will explicit instruction of metacognitive skills increase pupils' metacognition?

		(MK-1) Declarative Knowledge	(MK-2) Procedural Knowledge	(MK-3) Conditional Knowledge	(MR-1) Planning	(MR-2) Information Managment Strategies	(MR-3) Comprehension Monitoring	(MR-4) Debugging Strategies	(MR-5) Evaluation
Mean	Pre-Test	2.90	2.44	2.57	2.34	2.62	2.29	2.93	2.34
	Post-Test	2.91	2.74	2.70	2.41	2.61	2.48	2.84	2.45
St Dev	Pre-Test	0.52	0.72	0.51	0.63	0.59	0.72	0.53	0.56
	Post-Test	0.60	0.69	0.57	0.71	0.56	0.54	0.61	0.58

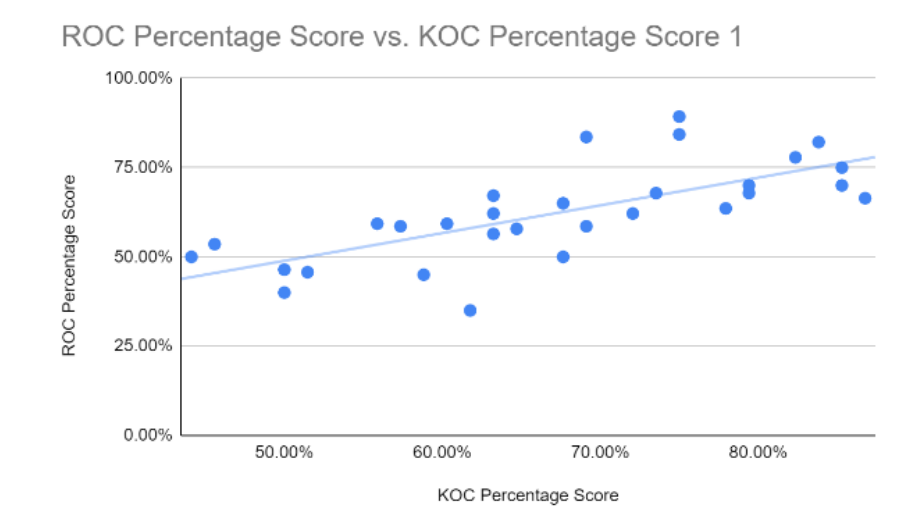


The results of the pre-intervention and post intervention tentatively indicate that there is an increase in metacognitive awareness after our short-term intervention; albeit the change is small and the finding is only descriptive; a causal relationship between the two variables can not be established. This is further analysed in the Discussion section.

Research Hypotheses

1. Pupils with higher levels of Knowledge of Cognition may have higher levels of Regulation of Cognition.

The pre-intervention results gave us reason to believe that if we could improve knowledge, our pupils' ability to regulate their metacognitive skills would also improve. By comparing the two sets of bivariate data, we observed that there was a clear positive correlation between our pupils' Knowledge of Cognition to their Regulation of Cognition.



- Older pupils may have higher levels of metacognitive skills.

Although broadly speaking older pupils exhibit a wider array of metacognitive strategies, our data indicated that age is not a definitive factor; metacognitive skills are not fully dependent on age. Two pupils in year 11 and year 9 have the third and fourth highest Metacognitive Index scores (MCI) in our sample.

MCI Total Score	Age
176.00	18
172.00	18
169.00	16
165.00	14

- SEN pupils may have lower levels of metacognitive skills.

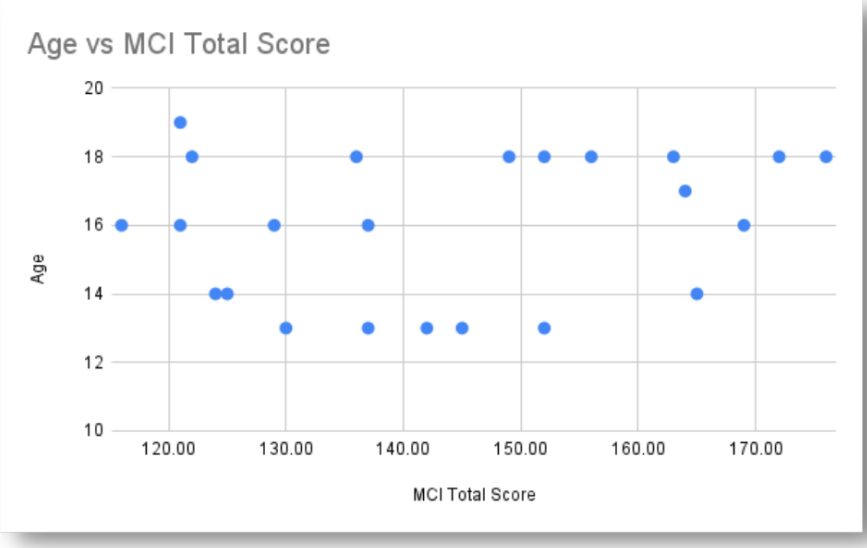
As the percentage of SEN pupils in our groups is high, our results are tentative. Yet, as highlighted in our discussion, we can observe that motivation to excel and explicit instruction can have a positive impact.

Discussion / Conclusion

Before proceeding to discuss the research question and the main hypothesis, we should note that the pre-intervention Metacognitive Awareness Inventory (MAI) provided tentative answers to two of our research hypotheses:

1. **Older pupils may have higher levels of metacognitive skills.**

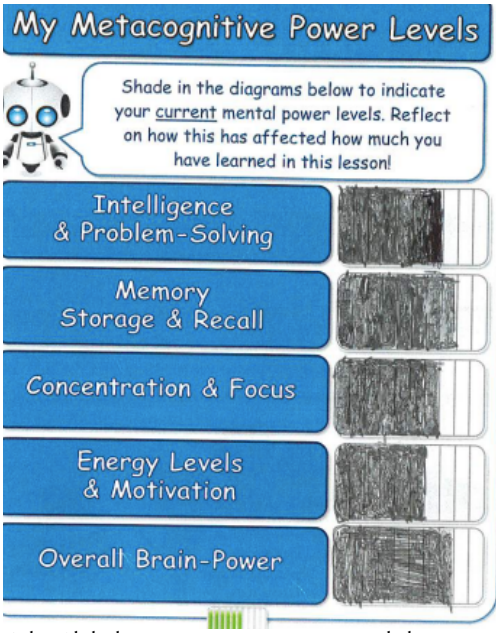
Our tutees range between 13 and 19 years of age. We initially assumed that older pupils were going to be better at monitoring and regulating their metacognition. The figure below illustrates the comparison between the Metacognitive Index Total Score (MCI) and the Age of our sample. In order to test correlation between age of the pupils and the total MCI score, we carried out a PMCC hypothesis which showed that there was no correlation. As the difference in age between the whole population was proved to be statistically independent, we could treat our whole population the same.

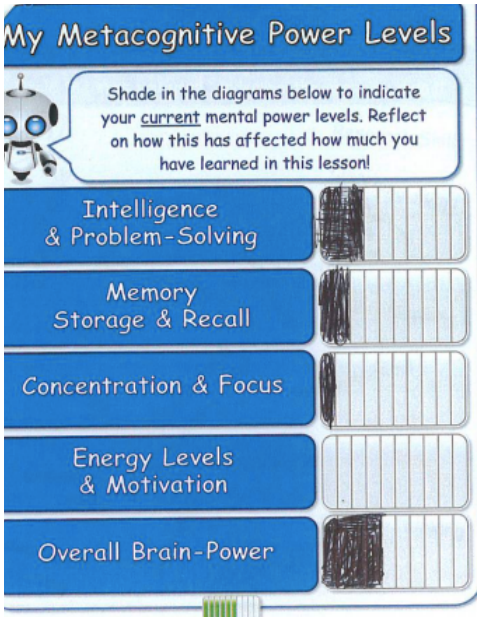


2. **SEN pupils may have lower levels of metacognitive skills.**

This hypothesis was key to our group as the college has a high percentage of pupils with SEN and we were keen to explore how and whether metacognition can support our pupils.

Based on the data, we can tentatively conclude that there may be a correlation between lower scores and special learning needs. Nevertheless, looking at the pupils' profiles closely, we can see that there are factors that could have a positive impact. For instance, two SEN students (y9 and y11) have higher metacognitive scores than their peers. The support provided by school or the family environment and the intrinsic motivation to succeed seem to be crucial factors that can help students to make better progress.





*The Global Metacognition Institute worksheets

Both pupils are in the same year group and they have SEN. The self-report of their metacognitive power levels is indicative of their motivation to progress and overall approach to learning .

The EEF (2018) suggests that motivation is an important component of self-regulated learning. This is because learners should possess the motivation and the perseverance to tackle problems and apply metacognitive strategies'.

This is a significant finding, with scope to be investigated in a future research. It is further explored in Ms P's reflections that highlight how explicit instruction can support pupils to overcome learning barriers:

My year 9 tutor group is a mixed ability cohort; seven out of 10 pupils have SEN, ranging from Dyslexia to slow processing to ASD. Four of the pupils are Core and they attend 4 weekly Learning Development lessons, in which metacognitive strategies are often explored as a way of approaching academic challenges.

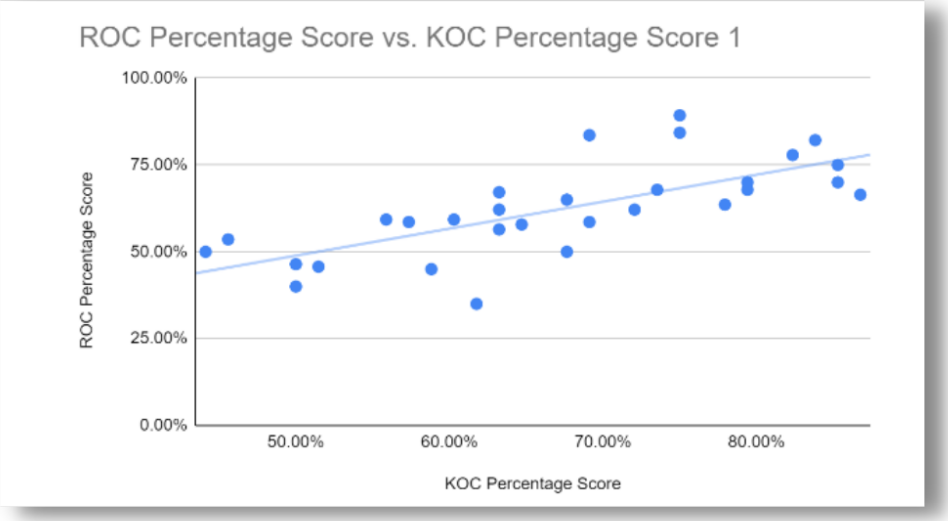
It is very significant to note that in the first self-evaluation each of these 4 students declared themselves among the top six in procedural knowledge, identifying themselves with the statement "I have a specific purpose for each strategy I use". This led me to conclude that the intervention of the Learning Development department was very significant in their development of metacognitive skills.

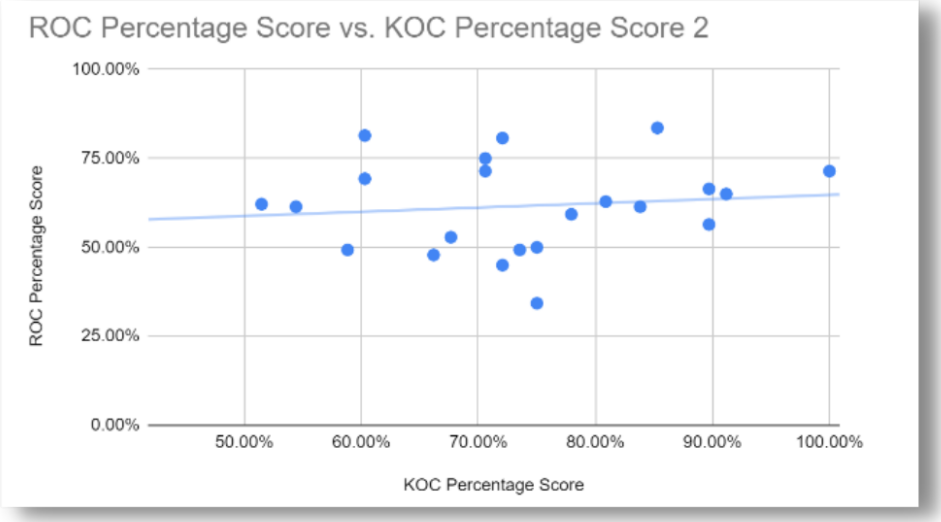
As already discussed, it is very difficult to assess metacognition. Although the data is encouraging, we should highlight that it would be impossible to establish that our short-term intervention alone is responsible for the positive changes observed. (Burns, 2021). Nevertheless, reflecting on our discussions with our pupils in a qualitative way, we could say that they had 'light bulb' moments when they realised that small changes may improve their academic performance. For instance, Mr P's year 13 group was reluctant to engage initially but they appreciated that "improving their knowledge of cognition would aid them in their studies".

Mr G conducted a thorough statistical analysis of the data; yet, for the sake of brevity, we will only present our final results.

Analysing the post-intervention responses, we examined whether the Knowledge of Cognition and Regulation of Cognition were still linked. The regression between RoC and KoC had become more distinct; now having a subsequent regression value of 81.87%. The second graphs' regression line, is seen to have a reduced steepness meaning an evident increase in the KoC scores. That said, although there is a small increase in the RoC scores, we can begin to theorise that although there is correlation, we cannot evidence causation, as previously hypothesised at the start of this study. We have come to appreciate that a quantitative correlational design cannot confirm causal relationships between two variables. It can only be descriptive because the changes in the tests could have been influenced by other variables; unrelated to the intervention.

Score 1 = pre-intervention
Score 2 = post-intervention





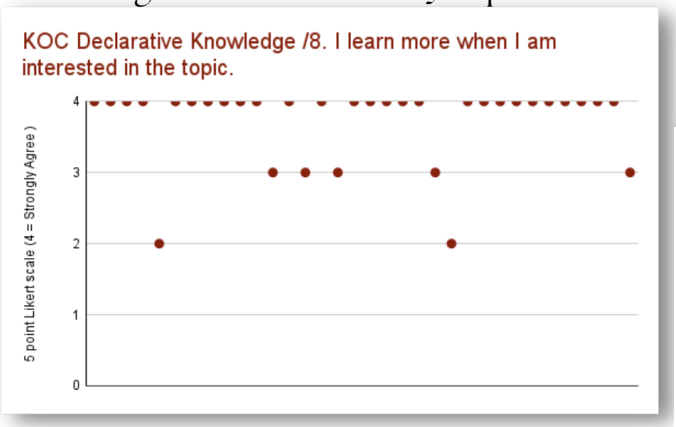
D. To improve the validity of our findings, we decided that we needed a more rigorous test to show the impact of our intervention; rather than simply viewing correlation and interpreting values of rates of change in regression lines. This was done by coding the original data, evaluating it by measuring the data's mean 'μ' and Standard Deviation 'σ' (location and spread) and interpreting our outcome values compared to that of the original model.

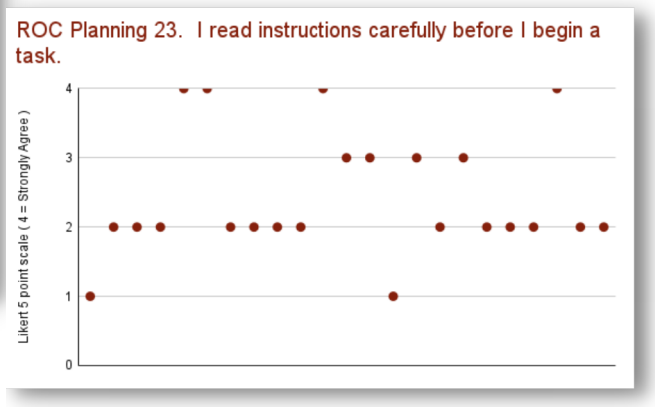
We hypothesised that due to our teachings there had been an improvement in Knowledge of Cognition and subsequently we should have seen an increase in the Regulation of Cognition of our students.

The KOC and ROC sample means for both of the tests improved after our short-term intervention. In order to prove that this observation had not been by chance we had to compare the new sample mean to that of the original model. The key output values show an 11% confidence interval of the improvements seen in the KoC scores happening purely by chance. Taking a 20% significance level, we were able to accept the hypothesis that our teaching had made a measurable impact in improving our pupils Knowledge of Cognition.

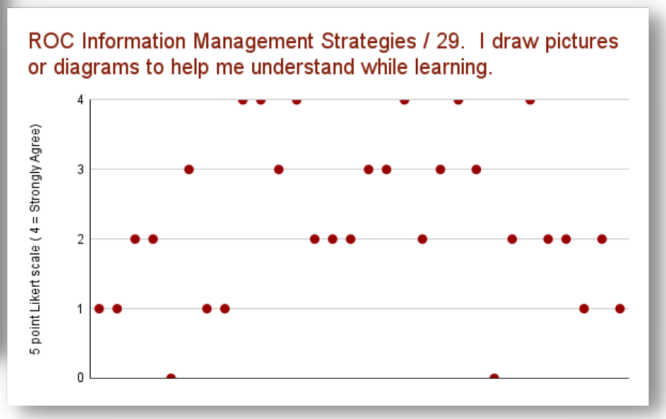
Nevertheless, we discussed earlier that we had incorrectly assumed that correlation had meant causation. We had theorised that due to the correlation of the two, improving one would improve the other. Although there was proof of their correlation, there was an observed probability of 44.4% likelihood of the small increase in sample mean happening by chance. At a 20% significance level this meant that we could not prove tangible improvements in Regulation of cognition due to our teachings even given that the KoC had improved.

E. A qualitative analysis of the responses would most likely provide us with an insight into our pupils' own perceptions of their weaknesses and strengths, as well as the trends in their preferred learning strategies. This could, in turn, inform our classroom practice. For instance, we all know that pupils will learn more when they are interested; still, it was fascinating to see this so clearly depicted in their responses.









Evaluation

EEF (2018) acknowledges that 'the reliable assessment of self-regulated learning and metacognition is challenging' but 'crucial to guide practice in the classroom'.

Our study and literature review indicates that developing metacognition is indeed an effective way to improve students' academic performance. Nevertheless, it does need to be well implemented and teachers need to be mindful of common misconceptions; such as that metacognition is more important than cognition or subject knowledge. The key is in the word itself: you cannot have 'metacognition' without having 'cognition' (EEF, 2018).

Our small-scale research explored the concept of metacognition; albeit it was short and limited by the small size, as well as various other factors, such as hectic tutor time sessions (Burns, 2021), students' absences, teachers' commitments and internal exams that placed barriers to a smooth implementation of the intervention and the data collection. In addition, the following limitations should be noted:

- While quantitative measures are generally easier and faster to score, a drawback is that self-report data is subjective and may not always be accurate (Schunk 2008). For instance, some our pupils may be 'tacit' learners, that is unaware of their metacognitive knowledge (Perkins, 1992).

- The method design did not support us to establish a causal relationship between the Knowledge of Cognition and the Regulation of Cognition. A mixed methods design would have strengthened the reliability of our conclusions. Qualitative data can provide deeper and more nuanced information, but is much more labour intensive and time consuming to analyse; thus, not appropriate for the purpose of this study. Nevertheless, it should be noted that we all closely examined our tutees' statements in a qualitative manner. We identified the patterns in their answers and, accordingly, we planned the content of our sessions.

To conclude, I would like to thank all members of the group for joining me in this learning journey. In particular, Mr G's contribution was crucial to having rigorous data analysis. The following reflective comments highlight that undertaking this research study and being members of the Learning Research Group (LRG) gave us all the opportunity for professional development, as well as raising awareness of metacognition as a skill that can have a positive impact on learning and academic performance.

- **Undertaking this research made us more reflective practitioners and we all embedded metacognitive practices into our teaching.**

Pedagogical outcomes: In my wider teaching practice, I have since been very explicit in my thinking skills, verbalising my approach to problem solving when presenting models to the classroom. When asking pupils to model their work, I now encourage them to verbalise their thinking process, referring to any problems they might encounter and the strategies required to find solutions. (Mr J)

The most poignant outcome for me is not the significant impact that this study had on my tutees. Rather, it is the impact that it has had on my own teaching. I have been completing my PGCE this year and being involved in this research group has had a profound impact on my practice. Reading academic literature and being involved in group discussions has increased my knowledge and understanding of metacognition. Therefore, I have been able to create resources and plan lessons within geography that promote both the knowledge and regulation of cognition amongst pupils. Moreover, the PGCE requires a lot of personal reflection and responding to feedback. This research group has allowed me to improve my own metacognitive ability because my awareness and understanding has improved. Overall, I would argue that being involved in this research has been a significant reason for the success of my PGCE. (Mr P)

My own metacognition has certainly improved, as such, equally has my teaching. Incorporating the skill or metacognition into everyday life and teaching has been so important in the offering I have given to my students. Firstly, emphasising the importance of students thinking about their thinking. Doing this by allowing more thinking time in lessons and time to plan how pupils are going to approach a problem. The second, questioning students to be aware of monitoring their progress not just through a problem but overall in the subject. When pupils get stuck about how to solve a problem in their work, whilst allowing them to have time to think, carefully consider questioning before the lessons in order to maximise their learning. Finally, incorporating time into the lesson to truly reflect on their work. When returning work to pupils requesting additional information such as reflections as well as response to all work. I have also started incorporating reflections in the plenary section of the lesson. Getting pupils to write a 'cheat sheet' on how to do certain problems when they understand the issues. (Mr G)

- We all identified future areas for action research and literature review.

The question regarding Conditional Knowledge "I change strategies when I fail to understand" featured scores below 3 for 90% of pupils. One such future area of focus highlighted by the data was how pupil anxiety affects learning and has motivated me to research ways to overcome this obstacle, in particular anxiety over mathematical problem-solving and tackling foreign language grammar gap-fill questions. In our tutor group discussions following the first questionnaire, pupils highlighted how in test situations, they often decided to abandon certain question types rather than be determined to find a particular method to find a solution. Unfortunately, due to time the constraints of being limited to tutor time sessions, I was unable to research further what metacognitive techniques can prevent anxious pupils' tendency to give up on problems too soon. This would be an interesting investigation going forward. (Ms P)

Reflecting on my teaching career so far, metacognition seems to be a natural progression; starting with the belief that the subject knowledge is all it matters to supporting pupils to develop their critical thinking skills to appreciating that pupils who have high grades are also independent learners and this could be the key to supporting low achievers to improve. When we started this research, my personal hypothesis was that if we helped pupils to develop their regulation of knowledge, they would feel more confident learners. This would then have a positive impact on their knowledge about cognition and their academic performance. The literature research, though, shows that this might be a misconception. Metacognition is not a general skill that can be separated from subject knowledge; EEF (2018, p. 17) very clearly explains:

> For example, a student can use metacognitive planning strategies when drafting a GCSE essay about Shakespeare. But without an understanding of Shakespeare's plays, language, and the relevant social context, the essay will not be successful. We cannot adequately deploy metacognitive strategies for monitoring and evaluating our essay-writing if we do not first understand the components of a successful essay and have a knowledge of Shakespeare's world.
>
> Metacognition and cognition display a complex interplay as pupils learn. We should look to develop both concurrently and not create false hierarchies where they do not exist.

Our study and my discussions with our year 9 and year 11 pupils most likely show the way to my next research interest: the role of motivation, an important component of self-regulated learning, in pupils' learning and development. (Ms PE)

- Our experience highlighted that it is important that teachers receive CPD on metacognition in order to become more confident in delivering the sessions.

We hope that we will present our ideas to our colleagues at INSET in August 2022 and we were pleased to hear that there is already a commitment to increase the work in this area by providing a bank of resources for Tutors to use during Tutor Time.

Mr J also informed us that the College is about to embark on its journey to gain 'Thinking School' status through Thinking Matters and accreditation with the University of Exeter.

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How can we make Memories Last for Longer? An Investigation into the Stimulation of Multiple Brain Areas to Enhance Student Memory.

ABSTRACT

For this intervention I aimed to experiment with improving student memory of key drama related terminology through both the method of teaching and the use of technology to practice and aid recall of the terms. This research sought to explore how effective stimulation of different areas of the brain would be in encoding memories and thus improving student outcomes. It was found that his did improve recall but that pupils found it difficult to engage, prompting the question: how can the value of this technique be balanced against the cost.

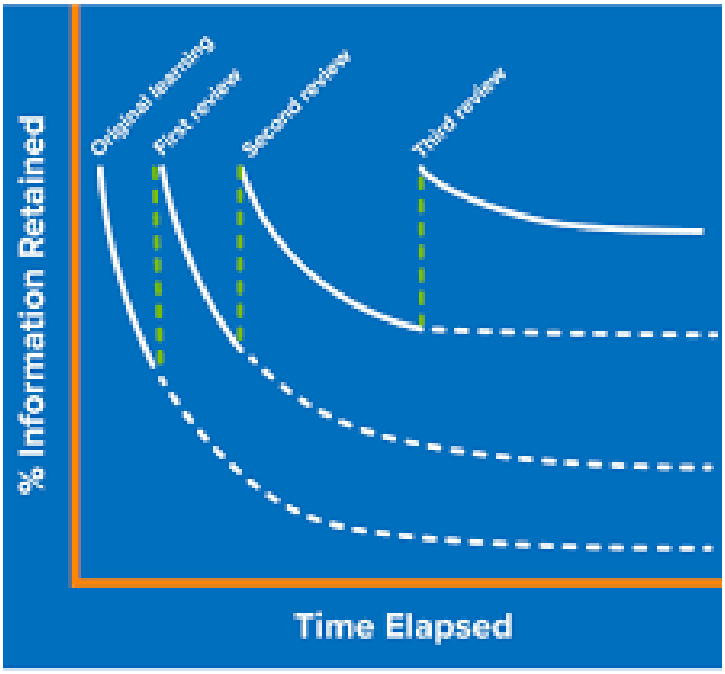
Introduction

Buckner and Wheeler (2001) state how important it is to encode a memory through as many senses as possible, enabling the person to recall the memory through any of the senses stimulated, thus giving them a greater opportunity for success. Since the elements I wanted the students in the trial Year 10 class to remember were key words, this meant focussing primarily on semantic memory and in particular the language areas of the brain. The aim was to activate Broca's area in the left frontal cortex, Wernike's area in the left parietal cortex and the visual form area in the left parietal cortex through different sensory means thus allowing the students to experience the key terms in a range of different ways, and hopefully improve their recall in a test situation.

Another important element of targeting a range of brain areas is that some of the words are homophones, such as 'gait' and were I to only activate Wernikes's area in the teaching of this word student understanding of its differences to a garden 'gate 'would be limited to a verbal description of the skill and thus less likely to be remembered. For this example it is imperative to activate the visual word form area and the visual cortex to fully encode the memory of this new word and its meaning.

Through regular testing I aimed to strengthen the activated neurones in these areas of the brain and so make the memory of the words stronger. As this key terminology forms the basis for all elements of drama from the written exam to performances. It is my hope that when new information is added, such as specific information from a set text, it will serve to strengthen the connection in the neurone network of these already active memories.

Teaching this class three times a week allowed me the perfect opportunity to allow the students to encode the information in a range of different ways, allow time for the students to sleep and consolidate the information before revisiting the information for further consolidation and then testing their recall. The spacing of the lessons (Monday, Tuesday, Friday) was interesting to me to see: if I used the Monday and Tuesday lessons to plan for encoding and consolidating the information, would Friday's lesson be close enough to those lessons to ensure the forgetting function (see diagram below) was not activated.



Forgetting or disremembering is the apparent loss or modification of information already encoded and stored in an individual's short or long-term memory. It is a spontaneous or gradual process in which old memories are unable to be recalled from memory storage

Research Question

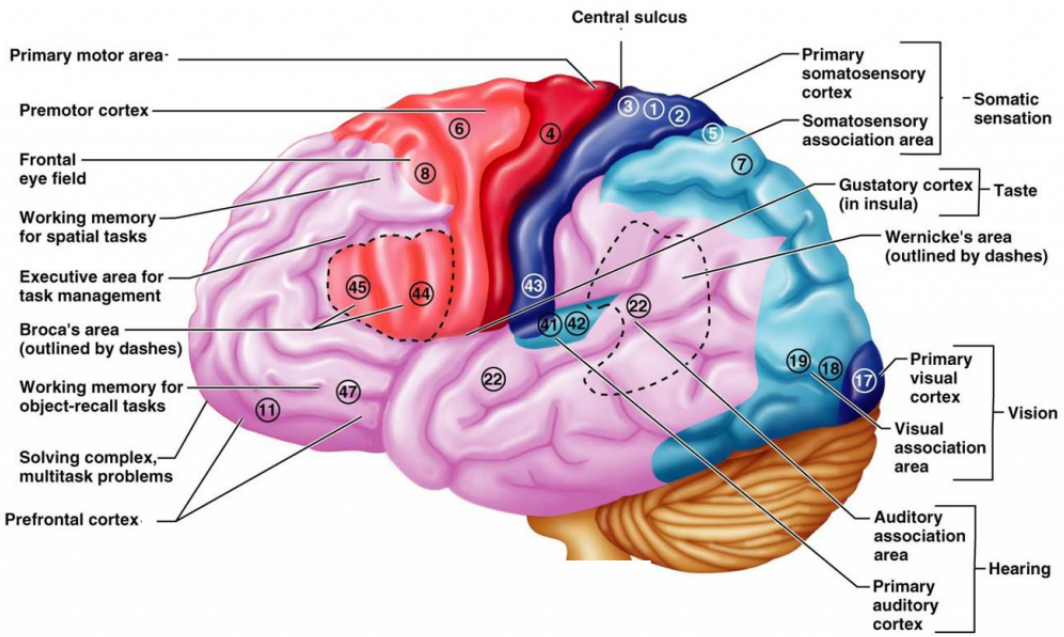
Can a focussed approach to the stimulation of different areas of the brain improve the encoding and recall of key terms?

Encoding

In order to activate each of the targeted areas of the brain for each key word I planned and facilitated a structured approach to teaching each one, as if it had never been heard before. One of the challenges with some of the key words is that they are well embedded in the memories of the students in different contexts. So an approach which tackled each individual word as brand new information for the students to remember.

I started with activating the visual word form area in the left parietal cortex by showing the students the word on a slide, followed by a slide which had the word plus its definition, then by a slide with the word, its definition and a picture to represent the word, to activate the visual cortex. To activate Wernicke's area I said the word and its definition aloud three times. I then asked each student to say the word and its definition aloud to the class, in order to keep Wernicke's area stimulated, but also to activate Broca's area. By this point it was my aim that all areas of the semantic memory were stimulated and through the tasks some sensory stimulation had occurred as well, specifically visual and auditory. To add a kinetic sensory experience the students had to write down the word and its definition in their books, and add a picture that would help them remember it, it could be the same as the one I used on the board, or something of their own choosing. Once they had done this I then asked them to say the word and the definition aloud again, but this time they had to add a movement or gesture to represent the word.

Brain Diagram

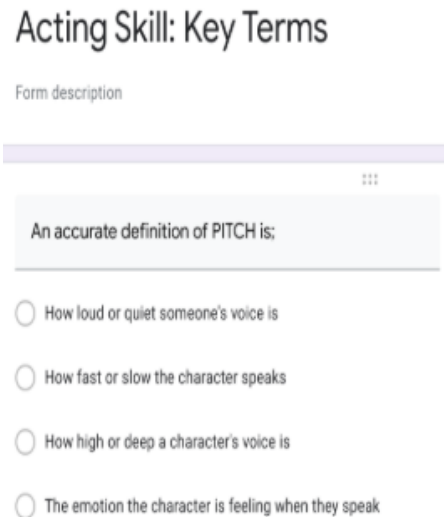


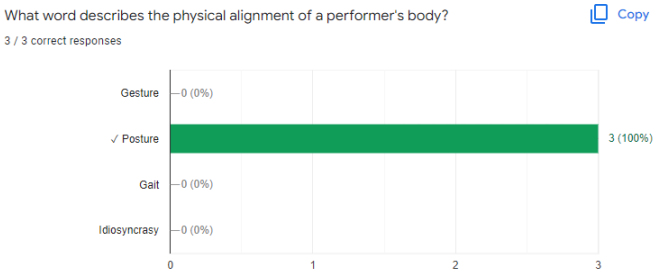
Consolidation

The next lesson took place the following day, thus students had time overnight to consolidate the memories through sleep. I wanted to further consolidate through revisiting each of the words at the beginning of the next lesson. Creating an environment of healthy concern I either said or wrote on the board the words one at a time and asked the students to repeat what they had done the day before, say the word and its definition aloud. Should they need to, they were permitted to look at their books, but encouraged them to only do this if they really had to. The students did not know who would be called on, so each student had to reactivate the memories encoded the day before and be ready to perform.

Recall

The recall task took place three days later and in the form of a google form quiz. This format is an excellent way to create individual quizzes and collect data. I chose to format the questions in a multiple choice format, which would enable me to see any misunderstandings on the key words. Often students mix up definitions of specific words which relate to either physical or vocal acting skills, so the four answers given were accurate definitions of other acting skills, ensuring the students had enough challenge to ensure accurate recall. The results of the quiz were very positive. 80% of the students achieved 100% in the quiz in the first week. With the other 20% getting two questions wrong. When they retook the quiz the following Monday, with a similar structure but slightly different wording, all students achieved 100%.





RESULTS

Before this intervention I hypothesised that spending focused time on encoding key terms would indeed aid recall and thus student outcomes. Indeed research backs this up time and time again and indeed this intervention supported the theory.

Whilst the recall quiz results have been an excellent indicator of how well the memories of these key terms have been stored in the memory of the students, another less tangible element at this stage is their use of the terms in day to day discussion of their own practical work and that of others in the class. The creation of this shared language that every student now has access to has improved both their written and practical work. Deeper connections are already being made through the use of the words in different contexts and there is now a solid basis of neurone connections that the students will be able to build on in future study.

Evaluation

Spending focused time on teaching the words and allowing time for varying encoding opportunities felt useful, focused and purposeful to me as the teacher in the first lesson. However, I feel that such an approach may become boring for the students. It was predictable by the end of the lesson and I had the general feeling that engagement had dropped.

The important thing now is to ensure that the success of this approach is not lost to the learning of more information and I must ensure regular opportunities for students to practice their recall on all that they have learned. To do this I will ensure one lesson a week has a quiz which will contain different elements of previously encoded material. This continuous repetition of information will ensure the student brains do not lose the connections made.

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Using 'World Building' to Help Support Students' Understanding of the Historical Narrative and Help Recall Key Information.

ABSTRACT

Students sometimes view parts of History they have studied as an alien world, a place intangible to them, which can often lead to them having a weaker understanding of the historical narrative. By making students imagine themselves inhabiting the worlds they are studying, I wanted to see whether this would improve their understanding and their abilty to recall. Pupils in Y9 showed only minor improvement with directed story telling, whereas pupils in Y10 showed greater improvement writing their own stories. Y10 pupils did not however favour this approach to quizing.

Introduction

The idea of 'world building' has grown within the history teaching community in recent years. As I tell my students, history is lots of stories linked together into one big story and therefore the subject lends itself to students being able to curate and inhabit the many worlds and stories they study. This process of 'world building' allows students to be able to imagine themselves in the context or event they have been learning about and by doing so hopefully build a stronger understanding of the topic.

Not only did I want to use the idea of 'world building' to help students with their historical narrative, I also wanted to trial different strategies on how they would create their worlds in order to see which had the greatest success. Both my year 9s and year 10s were studying the same topic of Weimar Germany, this allowed me to trial these different strategies on the different year groups and then use their opinions and data from their pop quizzes to see which strategy worked best.

With my year 9 class I started each lesson off with my own creation of the event they had studied in their previous lesson. By creating the story I felt I had more control over the significant parts of the events I wanted them to remember the most. I also tried to call upon different senses as I went through the story, such as smell, in order to help them recall the information better when they were tested later on. The student enjoyed the relaxing start

to the lesson, by being allowed to close their eyes for the first couple of minutes and listen as I took them back to the Sparticist Uprising or horrors of hyperinflation.

My year 10s, on the other hand, had weekly prep to constantly further their own story. By going through the cognitive process of creating their own world year 10 students would hopefully have a stronger understanding of the historical narrative rather than just listening. However, by giving them this independence I made sure that the work was highly structured, setting certain events or criteria they had to include within their story either in a diary form or a story form.

Method

A mixture of methods was used to assess the success of 'world building'. The main judgement for success would come from the pop quizzes which could be used to compare how well students were recalling information before this strategy was introduced and after, as well as comparing between the different year groups' ways of curating. Of course acknowledging some variations due to the differences in year groups. I also collected data through both open and closed multiple choice questions and discussion meetings about the students' take on this method and what they found most useful.

Research Questions

1.Does 'world building' improve students' understanding of the historical topic they are studying?

2. Does the process of students creating their worlds strengthen that understanding. in comparison to having a world created for them?

RESULTS

Year 9s

The data from my year 9 classes questionnaire showed that all of the pupils found that it benefitted their learning and that they liked the way I had chosen to start the lesson, explaining that this was due to it being “engaging” and “immersive”, something every teacher would want to hear about a starter at the beginning of the lesson. One student even offered an improvement of adding sound effects, an interesting idea that could potentially make the storytelling even more memorable. However, although the story telling made a good 'hook', my main reason for attempting this strategy was to help with students’ ability to recall and therefore the main evidence to suggest how successful it was could be seen from their results in their weekly pop quizzes. Overall the classes average went up from 8.1 out of 10 to 8.4. This shows some success overall, however, not the significant amount I was hoping for considering the time taken at the beginning of each lesson and also that the questions of the quiz had been carefully extracted from the stories I had retold to them at the beginning of the previous couple of lessons.

Year 10s

I asked a select group of year 10s for some feedback on how they found creating their diary entries and stories. I was pleasantly surprised at the level of effort I saw across the whole class. As previously stated, I made sure to structure their world building in order to make the task as beneficial and accessible as possible. I therefore included sentence starters and certain events that had to be included within their stories, to stop them going off on too much of a descriptive tangent, with my own example included. The students feedback was all positive, saying that they could see the benefits of the process in helping them recall information more successfully, stating that it pushed them to create a "clear timeline" of the events they had previously studied. However, surprisingly, students were quick to discuss that they preferred pop quizzes, something that gets a weekly groan at the beginning of most of my lessons. They explained that quizzes were less time consuming and because I was asking the questions, were focused more on the specific details they needed to know, such as dates and individuals, rather than the “waffle” in their diary which they felt easily made them "go off topic".

They also said that quizzes allow them to have an immediate check on their answers, in order to make sure any mistakes are swiftly corrected during that lesson and that misconceptions are quickly addressed. Again though, my criteria for measuring the success of this strategy was linked to an improvement of the students' ability to recall in the weekly pop quizzes. Just like with the year 9s there was an improvement in their results, however, the year 10s showed a bigger improvement with students moving from an average of 7.6 to 8.7 out of 10. This suggests that students going through the process of actually creating their world and immersing themselves by having to consider the historical narrative led to a better understanding of the topic and students ability at recalling key information more easily.

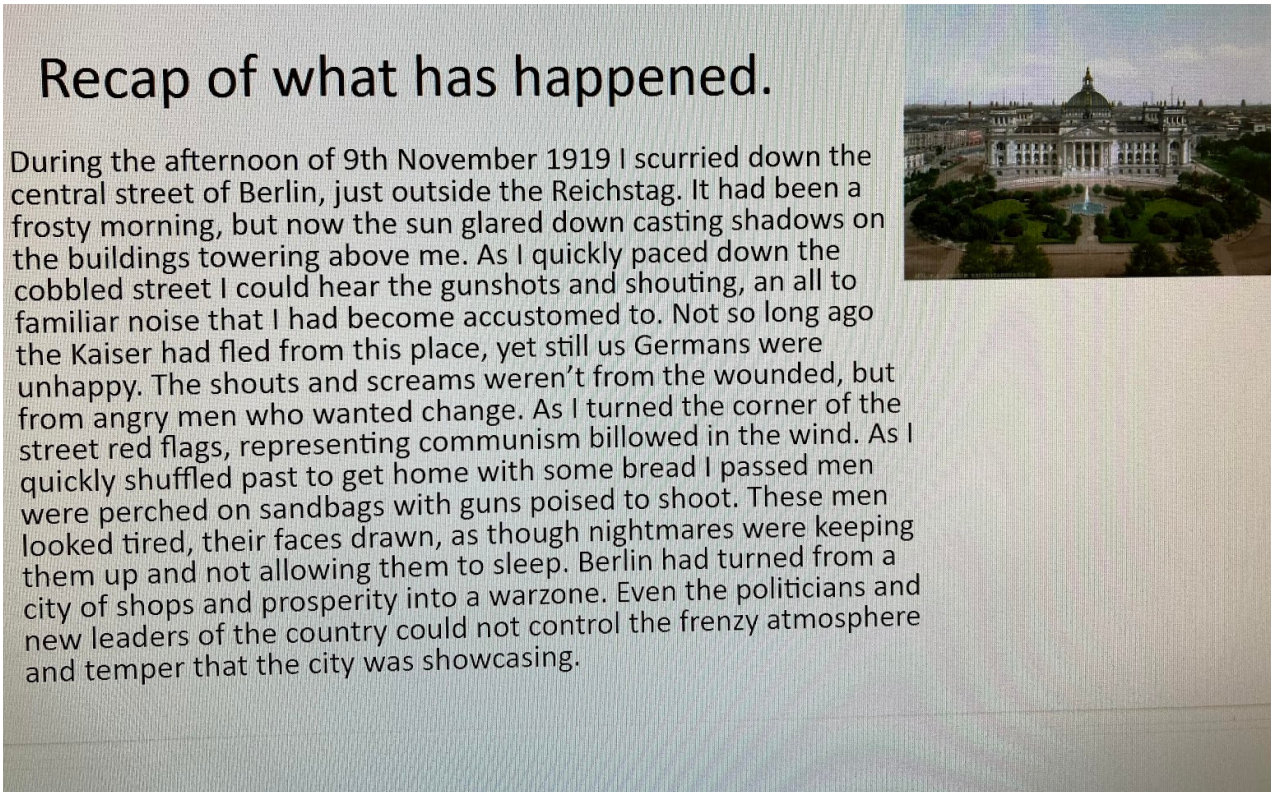


Image above is an example of my own stories to Year 9s.

December 18th 1918

Dear Diary,

I am currently staying in a German camp near the city of Cologne because my unit has been given the order to demobilize and withdraw back behind the border. Word is that a Treaty is being organised to end the war, and that it will be signed shortly between Germany and the Allied powers, but until then I am to remain with my unit near Cologne in case we are redeployed if negotiations sour. Also, the Kaiser abdicated just a few days before the armistice, and to that I say thank god, he was a man who led Germany into disaster, and hopefully this new government headed by Friedrich Ebert will solve Germany's problems.

I am living quite comfortably here in the camp, though it isn't the most luxurious place in the world because of the supply shortages caused by the damn blockades, it's definitely better than trying to sleep in a water logged hole in a field in france, with explosions going off in every directions sending shrapnel into any poor soul whose time is next. We have hot meals, hot showers and clean bedding for once. Things have calmed so much, that I think the adrenaline that had struggled to keep me pushing forward in those cold crevasses is finally wearing off. I don't think I could ever go back, I don't think anyone could even dream of going back.

It's weird to think that the war may soon be over, I've met a lot of people over my 2 and a half years as a soldier, and I've lost just as many in the carnage of the fighting. People like Fredrich, Joseph and Gustoph, people I will never see again, yet never forget. It will be lights out soon, I will write again at some point.

Hanz

29th June 1919

Dear Diary,

Our camp just received word that the Treaty of Versailles has just been signed, and that the war is officially over. We are being shipped back to our homes soon, finally Germany has run out of steam and can no longer fight. It was bound to happen sooner or later, if it didn't I probably would have deserted with most of my unit, they were tired too and I don't blame them.

Image above is a story created by one of my Year 10s

Conclusion

This study gave me the opportunity to trial this strategy that had been interesting me for a few years. Although a small study both classes gave evidence to support the idea of 'world building'.

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Evaluation

I would now love to expand on this idea further, possibly offering even more structure to students for their world building, including maps and materials.

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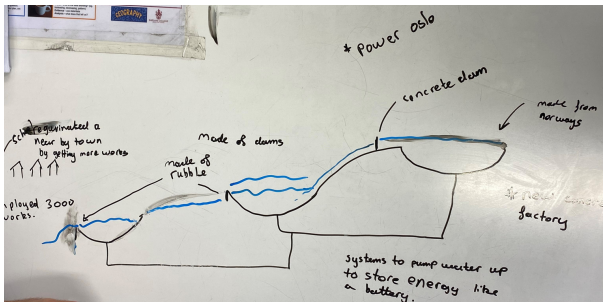
Recall Practise: Does Using Case Study 'Brain Dumping' Help to Improve Retention of Knowledge for use in 20 Mark Geography Essays?

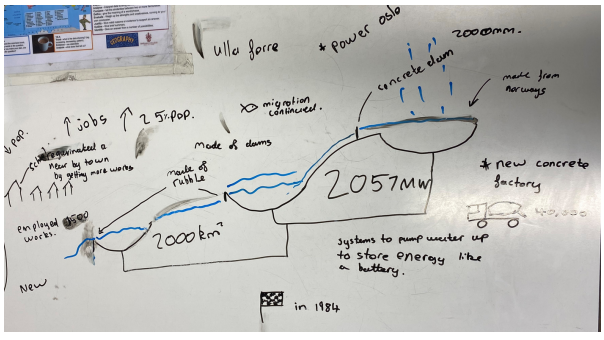
ABSTRACT

This research asked the question: does using case study recall practise help to improve retention of knowledge for use in 20 mark geography essays? Seven A-level geography students took part, and their performance before and after a series of lessons involving recall practise. Pupils' average performance in 20 mark essays prior to the intervention was compared to their marks in a 20 marks essay in their mock examination. It was found that participants performed better in the mock than previous attempts. Question are asked about the extent to which the recall practise can explain this improvement and the students views on the intervention are briefly considered. Suggestions for improvement and future research involving dual coding is put forward.

Introduction

Dunlosky et al (2013) consider a range of different techniques from cognitive and educational psychology that yield promise as having a strong evidence base that could translate into the classroom. Of the techniques evaluated recall practise and space practise had the strongest outcomes in terms of utility, that is to say they generalised well across age group, contexts and subjects. This investigation aimed to see if weekly recall practise of a specific topic yielded improved outcomes in a 20 mark essay.





Refererences

Dunlosky J, Rawson KA, Marsh EJ, Nathan MJ, Willingham DT. (2013) Improving Students' Learning With Effective Learning Techniques: Promising Directions From Cognitive and Educational Psychology. *Psychological Science in the Public Interest.* 14(1):4-58.

Research Question:

Does using case study recall practise help to improve retention of knowledge for use in 20 mark geography essays?

The Intervention

Once each week through the spring term, students were asked to write down everything they can remember about the Ulla Forre, Norway electrical energy strategy case study on a whiteboard desk in 5 minutes. Students were then given another 3 minutes to add additional information using the textbook to the diagram. The teacher would take a photo of case study drawing and pupils were given one minute to memorise the information and rub off the whiteboard desks. Students were then given 5 minutes to recreate their case study drawing onto the desk. Finally he teacher would circulate to show the photo vs what pupils recreated to show how much the students had remembered.

METHOD

Sample

- The primary focus was on one mixed ability group of seven A-Level Geography students. This group was asked to do the intervention activity each week leading up to their mock exams (The Norway case study was coming up).

Design

- This research was initially planned to be a mixed methods design. The quantitative element was completed in this investigation; comparing past performance against mock performance after the intervention. The qualitative element was planned to include an interview with the class to offer some insights into student perception of the impact of the intervention. Unfortunately the qualitative element was not completed before M left the College, however informal conversations were had about the intervention, and these do add to the general picture of the results.

Data Analysis

- A simple comparison table was drawn up to compare the mean score of pupils essays prior to the mock examination and intervention to the mean essay score for those four pupils that chose the 'Norway Question' in the mock examination. A general summary of teacher interpretation of class feedback was also included.

Ethics

- Another set of 7 generally higher ability A-level Geography students students were asked to do the same activity but for another case study. It was an ethical decision that both groups complete the activity with both sets so not to inhibit the learning of the second set. Both sets were offered the choice between two questions, one of which was, "Evaluate the success of one country's electrical energy strategy in overcoming issues of demand and supply of electricity" (20 marks).

RESULTS

Quantitative

Mean Score in all 20 Mark Essays Prior to Intervention	Mean Score in 'Norway' 20 Mark Essay Post intervention
8/20*	11.25/20**

Figure 1: *Showing the mean scores for pu[pils in the intervention group before and after the intervention*

**For 7 A-level geographers ** For 4 A-level geographers who chose the 'Norway' Question*

We can see from the above, that those pupils copleting the Norway question performed on average 3.25 marks higher than their pre-intervention average.

Qualitative Findings

From having informal conversations, all students really valued this lesson activity to help retain case study knowledge and test themselves. We regularly do this in our lessons.

Discussion/ Conclusion

On the whole it appears that this can be a useful intervention for improving retention of knowledge of specific topics- in this case the 'Norway' case study. However, there are other factors which may better explain the increase in performance before and after the intervention, including independent revision.

The qualitative data though somewhat limited, does show that the pupils valued the task, and that it was enjoyed both both groups. Regardless of whether or not the cause of the increased marks can be attributed to the intervention, it does add recall practise to the pupils revision repetoire and act as a useful recap and starter for lessons.

Evaluation

One of the difficulties in using mock assessments as a data source is that pupils are likely to have revised using a variety of methods up to the examination, and so it is impossible to determine the extent to which the imporvement of 3.25 marks can be attributed to the intervention.

The original aim of the case studies was to get the students to complete them as pictures and key figures - similar to dual coding. However, most students decided to do mind maps with longer form facts. Although it was still useful, in future I would be more determined on students converting long form information into pictures to test the usefulness of using images in memory recall.

Strategies Used by Year 13 A level Sociology Students which Proved Effective in Enhancing their Memory

ABSTRACT

The content in A Level sociology is considerable. For this reason, I have endeavoured to find the best methods, which my students and myself should employ, in order to achieve the most favourable outcome in exam conditions. Pupils in a mixed ability Year13 sociology class were given a questionnaire about there preferred methods and reasons for this choice. Their preferred methods were compared to outcomes in the February/March mock cycle. It was shown that mindmapping and practise questions were preferred, but that the student who chose retrieval practise had higher outcomes- consistent with the literature.

Introduction

Within my research group, the weight of evidence suggests that methods of retrieval practice, which is recalling what you remember about a topic from memory, without looking at any stimulus, is the most effective method for retaining large chunks of information, such as that which students need in exam situations. However, the evidence also suggests that to embed the learning and ensure it is in the long-term memory; students should combine retrieval practice with interleaving.

Interleaving involves the student studying a topic, within a subject one day. They can use retrieval practice at this time. However, the interleaving occurs when they return to the topic, more than 24 hours later, and test their recollection using retrieval practice. This 'spacing', as it is sometimes referred to, is what makes the learning stick.

Throughout my Year 13 lessons, in sociology A level, I frequently discussed my research with my students and how they should use both retrieval practice and interleaving. In clinic, or additional study, sessions, I employed this technique to help the students learn. I could test the impact of the cover-up and retrieval practice, in lessons the following day and later on in their A level studies.

Generally, to revise a topic, I will use mindmaps or knowledge organisers. Once I have supported students in making their own mindmap, I will ask them to take a good look at it and try to take it fully in. Then I get them to turn it over or put it away and on another piece of paper to write out as much as they can recall.

Therefore, to find out if my students were employing this method in their own independent exam revision, I put together a questionnaire to ascertain which techniques pupils prefer to use in class and independently, and if these techniques are effective in relation to pupil outcomes.

The Research Questions

Which Strategies do pupils prefer?
Which strategies are effective in my classroom?

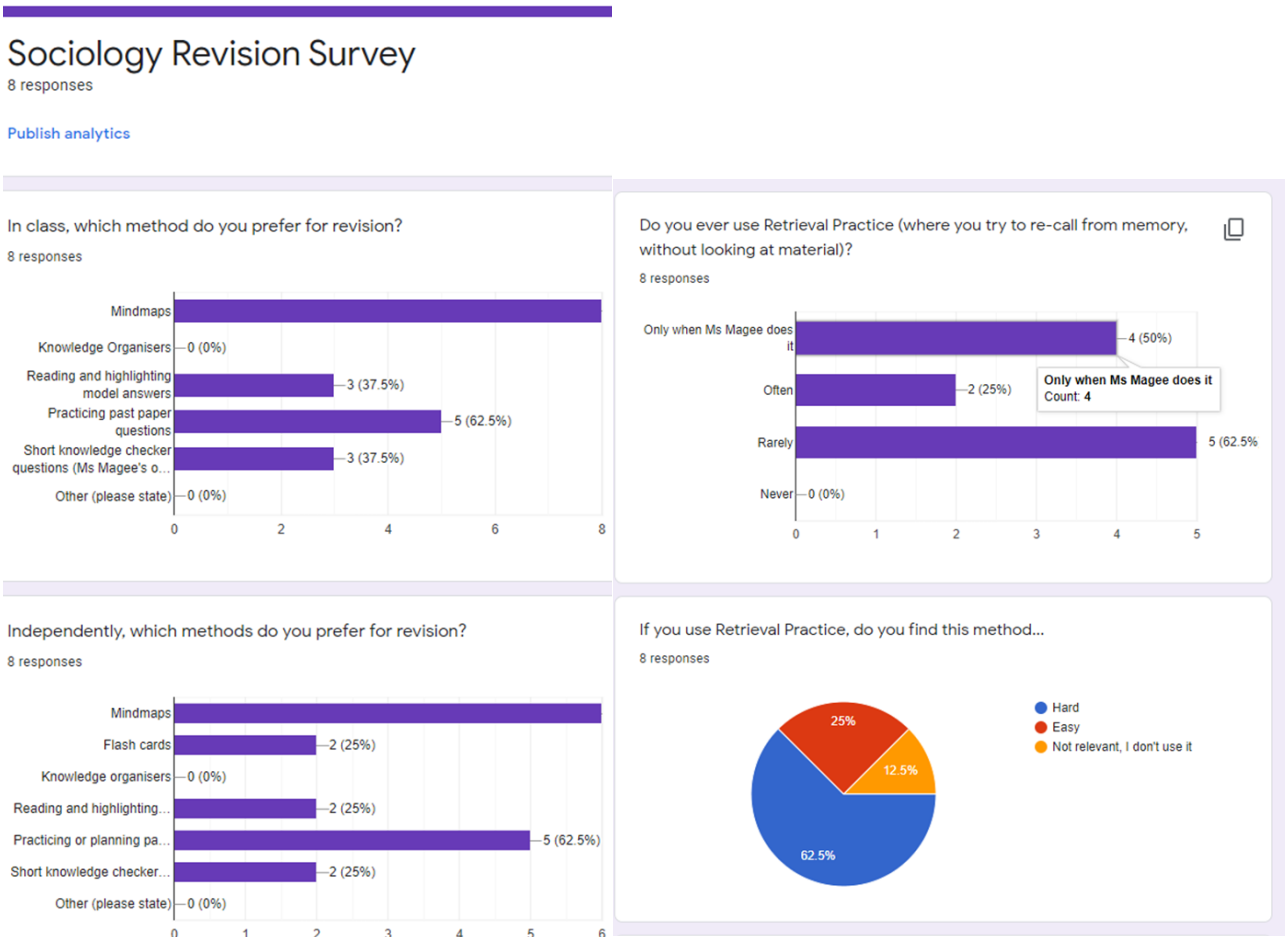
METHOD

A quantitative approach was taken to my research. Quantitative data was collected via closed questions. These related to multiple choice questions about techniques pupils preferred, and their perception of the value of these techniques.

I also compared pupil outcomes in recent assessments against their preferred style of revision to see if their was a tentative relationship between outcomes and chosen revision style.

RESULTS

A summary of responses to the questionnaire can be seen below



1. Which strategies do pupils prefer?

The most popular strategies in class were mindmaps followed by question papers/ practise. The same was seen in preferred strategies for independent revision.

Eight out of a total of nine students responded and all said, in their independent revision, they used mind-mapping techniques. Of those, four said they only used cover-up and recall, retrieval practice in clinic led by myself. Two thirds said they found this method, challenging.

Furthermore, when asked what methods they found least effective for revision, answers included: highlighting.

2. Which strategies are effective in my classroom?

The student who used interleaving combined with retrieval practice, obtained the highest B grade in the group of nine. The other two, who also used this technique, though not as frequently, also obtained B grades. Of the students who used retrieval practice some of the time, but mainly mindmapped knowledge, two achieve D grades and one a C. The three students who said theyuse exam practice questions only achieved D grades and one student achieved a U, as they did not sit all the exams.

Conclusion

The links between student outcomes and their preferred techniques would seem to add to the evidence that the best method of embedding content in memory is the combination of retrieval practice with interleaving. Though it would also seem that the most ambitious students will try this method and they, possibly, are the most likely to achieve regardless of their choice of revision technique.

Additional Follow Up Data

In a group discussion with my Year 13 Sociology A level students, I was able to establish who, exactly, had used retrieval practice and whether they also used interleaving. Out of nine students, three said they used retrieval practice either all the time (one student), the other two said they mainly did this, depending on time. Only one student combined retrieval practice with interleving. Of the remaining six, three said they only used mindmapping. They did not do retrieval practice because they found it too hard or they did not have sufficient time. The remaining three said they used exam practice questions as their main method of revision.

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AVENGERS ASSEMBLE!

Student Views on Collaborative Learning

Introduction

- Our Learning Research Group focused on Collaborative Learning, as defined to mean active engagement and interaction among group members to achieve a common goal (Nokes-Malach, et al).
- Our team of 6 worked through literature, put in several different interventions, and fed-back on ideas on how to get the most out of it.
- My research involved sampling student opinion on collaborative learning in the form of an online questionnaire. I then analysed the results as part of thinking how best to implement collaborative learning in the classroom.

Literature:

When Is It Better to Learn Together? Insights from Research on Collaborative Learning; Nokes-Malach, T., Richey, E., Gadgil, S

Cooperative Learning Is a Brain Turn-On; Willis, J

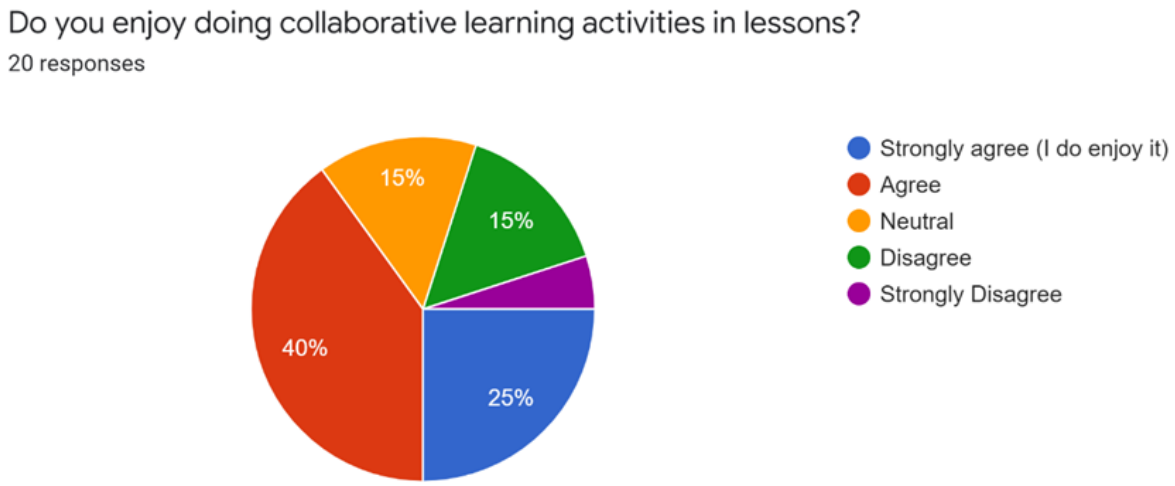
Keys to Successful Group Work: Culture, Structure, Nurture; Allen, K

Cooperative Learning and Peer Orientation Effects on Motivation and Achievement; Hancock, D

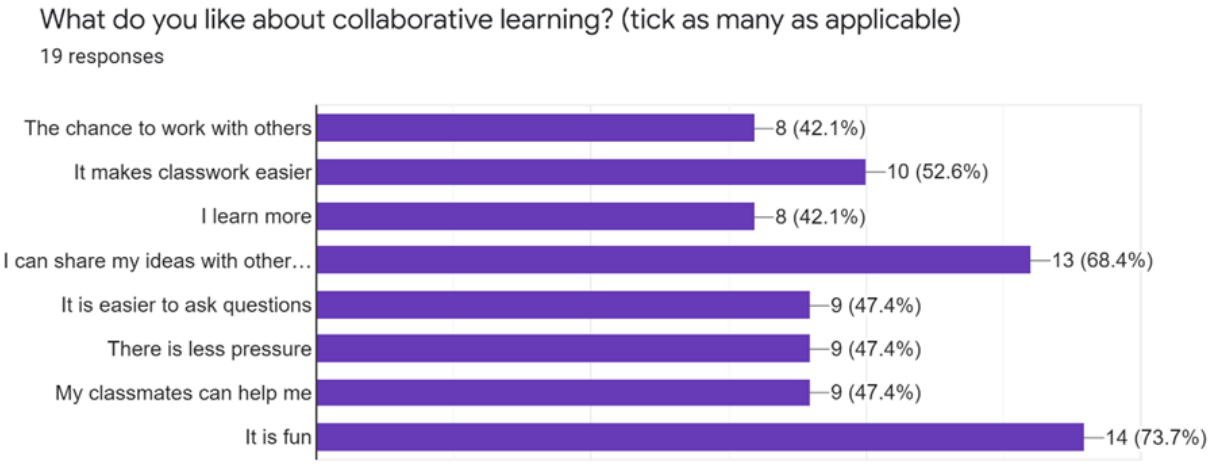
Survey of Actual and Preferred Use of Cooperative Learning Among Exemplar Teachers; Lopata, K

Method

- I put out a survey questionnaire for a range of students in Y10, Y12, and Y13. These are students in History that I regularly do Collaborative Learning with as part of each lesson
- There were 9 questions with multiple-choice answers
- There were 20 responses



In relation to enjoyment, a quarter of students strongly agreeing, and nearly two-thirds agreeing overall, it is clear that there is a positive response to doing Collaborative Learning. However, a significant minority still expressed dissatisfaction. This shows the importance of doing Collaborative Learning effectively to get it right.

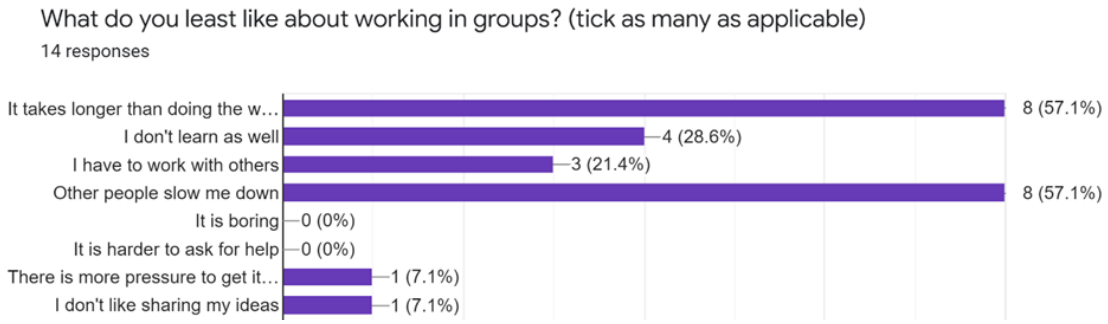


Regarding what pupils like about collaborative learning, it is encouraging that the most popular response was that 'It is fun.' Pupil enjoyment is an important part of learning, particularly with adolescents. Being comfortable and relaxed to complete an activity opens up neural pathways to the circuits to the higher cognitive centres of the brain where information is processed, associated and stored for later retrieval and function (Willis).

The chance to share ideas with others is also clearly highly valued by the students. One of the key benefits of collaborative learning is the re-exposure effect or relearning through retrieval:

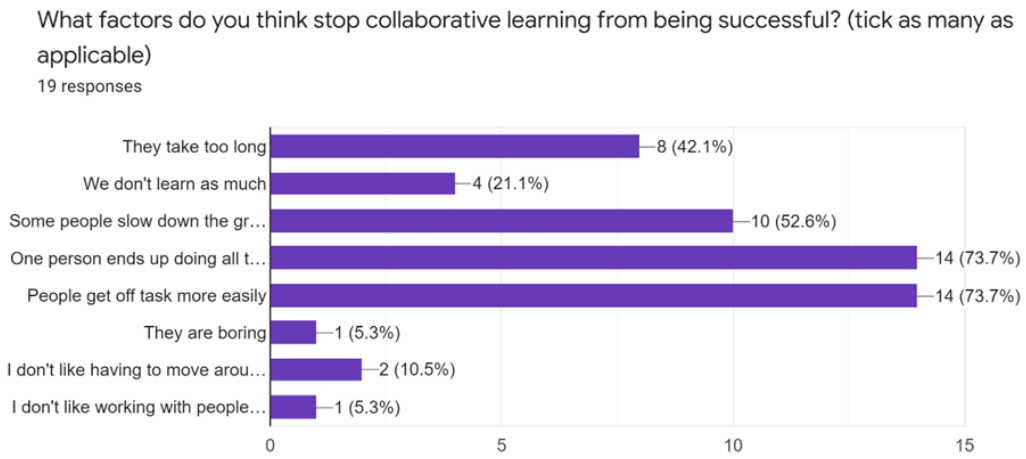
'The relearning through retrieval mechanism is not unique to collaborative learning but builds on the larger memory literature that shows attempting to retrieve information can improve individuals memory of the information' (Roediger and Karpicke). Because many collaborative learning scenarios include recalling in groups, this mechanism has a high likelihood of being enacted. (Nokes-Malach, et al)

The third most popular choice, 'It makes classwork easier' is an interesting response. This might come from the chance for students to pool knowledge and to share their work loads, clear benefits of group-work. But these responses need to be put into context with responses to the next question.



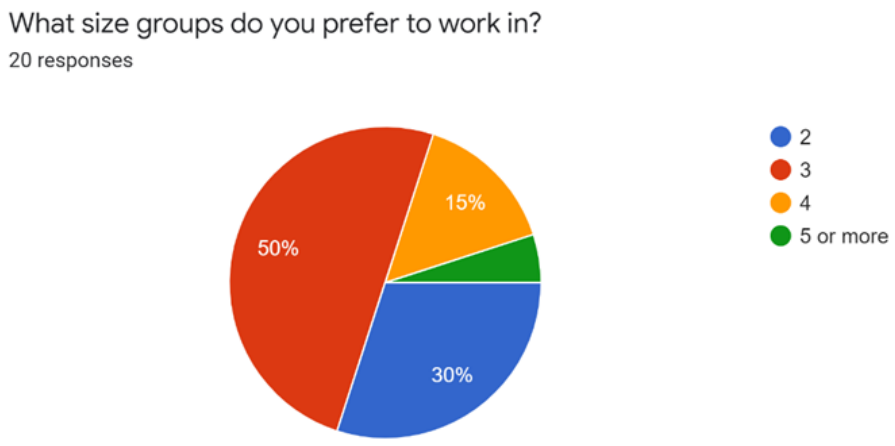
The reference above to speed is interesting. We can perhaps hear our stronger learners here. The idea that collaborative learning can also impede learning is noticeable here and worth noting. One drawback of collaborative learning if not properly managed is called 'production block' where the drama of working together impedes the learning process which would not be the case if the students were working individually (Nokes-Malach, et al)

These points are picked up by the findings from the next question.

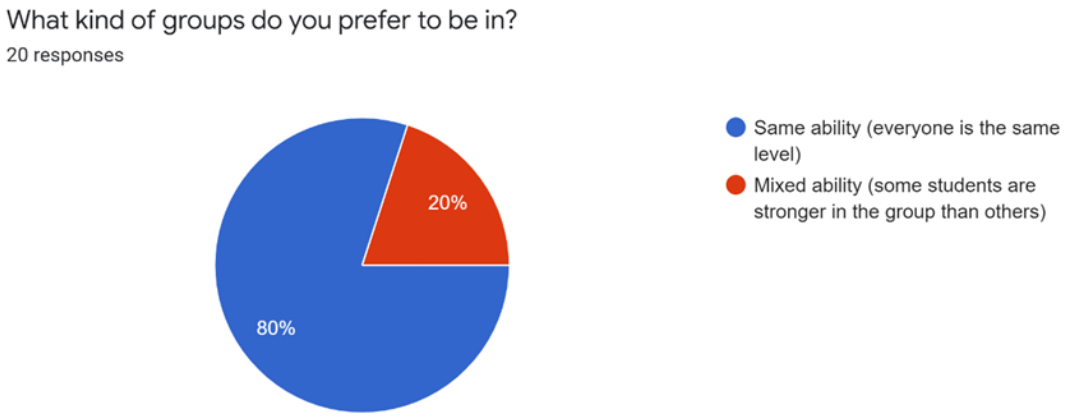


Here, there is reference to the work being boring, however the overwhelming responses focuses on how one person does all the work, or people get off task more easily. This highlights the need for structure in group work. An effective mechanism of collaborative learning is making sure that students have clearly assigned roles that they have to complete on the understanding that not doing so will fail the whole task for everyone in the group.

This can include having a facilitator, a resource manager, a task manager, etc. These are really interesting answers and give us some ideas as to why Collaborative Learning doesn't always work, and what we should be focusing on to make it click more effectively. The idea that 'one person ends up doing all the work' is also interesting. This is a reference to what is called 'social loafing' or 'diffusion of responsibility' which is obviously a possible side-effect of collaborative learning if not managed properly (Noakes et al). Again, assignment of roles can help with this.



Regarding attitude to group size, I think this response was also really interesting. Students prefer smaller groups. 3 in a group was more popular than just a pairing, but moving into larger groups was not as popular. This is possibly referring to how social problems can disrupt group learning, and the larger the group the more pronounced this could be: 'Despite that impressive record, researchers discovered an array of personality variables (e.g., peer orientation, shyness, anxiety, introversion, and persistence) that often mollify the positive effects of cooperative learning (Hancock).



Regarding 'types of groups' this response is also illuminating. One of the key strengths of Collaborative Learning is supposed to be the opportunity for students to lift each other. A Kagan seating plan, for example, is designed with mixed group abilities specifically in mind. However, students have here overwhelming voted for same ability.

While this is informative, it could also be interpreted as meaning that the group work they have been doing in my classroom has not been properly structured in a way that meaningfully allows higher-achievers and lower-achievers to work constructively. The research shows that students also prefer smaller groups, however this can sometimes reduce the positives of collaborative learning simply because there are less people to collaborate with (Lopata).

'The idea was to bring together a group of extraordinary people...' :

Drawing conclusions

- There is much evidence that students enjoy collaborative learning and see the benefits
- Students believe collaborative learning is 'fun' and 'like sharing their ideas', but also worry that it leads to diffusion of responsibility and can lead to them getting off-task
- Students prefer to work in smaller-groups that are of same ability
- Students prefer to do collaborative work frequently

Collaborative Learning: Does Assigning Students Task Specific Roles Improve The Learning Experience of all Students?

ABSTRACT

This research considered the effective administration of collaborative learning tasks, specifically the practice of assigning roles to students. In doing so, it sought to reinforce the idea that collaborative learning is not effective for all students, unless there are clear parameters and they are held to account both by the quality of the work produced and by their peers. It followed research previously completed and allowed for the consideration of different types of roles to fit the different types of tasks. Collaborative learning should be adaptable and helpful to all learners and this research suggests that giving roles based upon teacher assessment of students' strengths is effective.

Introduction

Within many classroom settings, some collaborative or cooperative learning will be taking place, whether this is through simple 'think, pair, share' starter tasks or more complex and longer lasting project tasks. The success of any learning task relies upon, and can be tested by a number of different factors, cognitive and social, and is not merely successful based upon students creating physical work; the quality of this work can vary greatly. From the research undertaken by Nokes-Malach et al., it is clear that the beneficial outcomes cannot be viewed in isolation and that tightly controlled classroom conditions must be put into place. Allen (2012) suggested a three-fold consideration ('Culture, Structure, Nurture') should be made when planning collaborative tasks. The hypothesis therefore considered is surrounding the structure of an activity, specifically the assigning of roles to individuals, and how this could be considered to be integral to its success.

There are a number of models available for the assigning of roles. Examples include:

- Facilitator, resource manager, task manager, recorder.
- Captain, timekeeper, sceptic, enforcer, cheerleader.

Successful activities rely upon the teacher carefully considering the most useful roles for the planned task.

RESULTS

Teacher observation

- The tasks where there were assigned roles became more purposeful (even though they did not necessarily have more tangible outcomes).
- Students were able to hold each other to account.
- The tasks need to be those that cannot be accomplished alone and thus each member needs the others.
- The class becomes a 'community of learners' (Allen).
- The quality of the collaborative essay was clear, students marked them and fed back higher marks.

Student observation

- Exit tickets used with KS3: 'Identify an area of strength for your group', 'How could your group have improved their work?'
    - Task 1 strengths: 'we worked well together', 'we assigned each other different questions'.
    - Task 1 improvement suggestions: 'X should have worked harder', 'I did most of the work', 'we were chatting and ran out of time'.
    - Task 2 strengths: 'X kept us on task', 'Y said I did well', 'we worked well as a team'.
    - Task 2 improvement suggestions: 'we could have tried different roles'.

- **In conversation with KS5:**
    - Task 1: many felt that they wasted time chatting or all working on the same section. A sense that creating a good presentation should have taken them less time.
    - Task 2: students worked with purpose and found that having a leader and a fact checker (proof reader) made their task clear. They were also asked to mark the work of another group and the essays gained higher marks than similar work completed alone.

Discussion/conclusion

Although the quantitative data from my research is limited, the engagement with tasks was clearly improved be assigning roles to the students. The ownership and, to a certain extent, the feeling of being held to account by their peers encouraged students to take more time and care over tasks. In order to avoid collaborative inhibition (where a student's learning is lessened by group work), assigning roles based on the teacher's knowledge of the students is vital.

There was an observable difference in classroom atmosphere and management when students were assigned roles that were less appropriate for them.

Evaluation

Whilst collaborative learning research can be difficult to test in a quantitative manner, it would be useful to run the same tasks across different groups of students in order to have a 'control' group and a research group. This could then be transferred into an assessment of the learning done or an evaluation of the project produced. This is problematic where a researcher teaches one group within a year but could be tested across a department at KS3/KS4.

Furthermore, the assigning of roles in collaborative learning needs to be considered on a task-by-task basis, as well as being adapted based upon the subject in question.

References

Allen KC. (2012) Keys to Successful Group Work: Culture, Structure, Nurture. *The Mathematics Teacher*. 106 (4): 308-312.

Hermann Z. Edutopia. (2021). https://www.edutopia.org/article/roles-encourage-equitable-collaborative-learning. [Accessed 17th May, 2022]

Koutselini M. (2008-2009) Teacher Misconceptions and Understanding of Cooperative Learning: An Intervention
Study. *The Journal of Classroom Interaction* . 43 (2): 34-44

Nokes-Malach T J , Richey JE, Gadgil S. (2015) When Is It Better to Learn Together? Insights from Research on Collaborative Learning. *Educational Psychology Review*. 27 (4): 645-656.

Washington University Center for Teaching and Learning. (2022) https://ctl.wustl.edu/resources/using-roles-in-group-work/. [Accessed 17th May, 2022)

Willis J. (2007) Cooperative Learning Is a Brain Turn-On. *Middle School Journal*. 38 (4): 4-13

Incorporating Meaningful Collaborative Activities into Mathematics Classes

ABSTRACT

Groupwork is seldom used in mathematics classes compared to other subjects. Factors which prevent maths teachers from using collaborative learning include concerns over classroom management; increasing planning time; and scepticism as to the utility of group work. The first concern can be targeted by careful planning and understanding of what increases likelihood of successful group work. Planning time could reduced by more sharing of best practice and resources within the department.

Introduction

Discussions with colleagues have raised various deterrents to incorporating more collaborative work into mathematics lessons. Themes which are common across all subjects are namely behaviour and classroom management; including students unfairly allocating the workload. This is supported by literature which argues that teachers are reluctant to use groupwork as they fear they will be unable to ensure appropriate behaviour and engagement to make it worthwhile.[1] In a mathematics setting, further considerations may discourage teachers from using collaborative activities. Firstly, students are reluctant and unaccustomed to 'talking maths', with many teachers and students viewing maths as an individual activity which does not lend itself to collaboration. Secondly, it is challenging to find meaningful maths activities which are suited to collaboration, and which can be extended and differentiated for a group of students.

This scepticism over the utility of groupwork in maths settings does have some basis. Whilst there is much evidence for the benefits of collaborative learning; some students also perform worse when working with others.[2] However, benefits to 'well-implemented groupwork' include reduced maths anxiety; better understanding and retention of concepts; and improved ability to communicate mathematically. For this to happen, groupwork must be appropriately planned for with a clear structure and meaning. With increased use of groupwork, students feel more comfortable and trusting working together and will thus benefit more from these activities. [3]

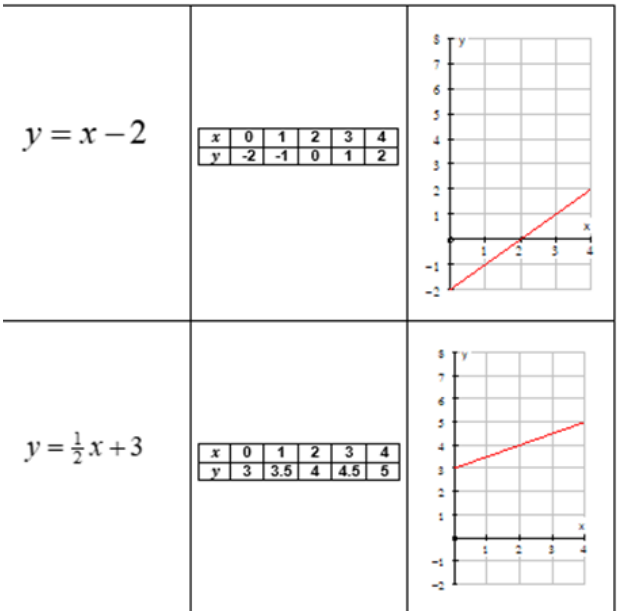
The concerns mentioned above appear to be surmountable. The mathematics-specific concerns can be targeted by actually doing more groupwork; encouraging frequent student discussion of maths (with support and scaffolding from the teacher); and taking the time to choose activities which provide scope for collaboration, discussion, and extension. To that end, I started using more collaborative activities with my 9MAT4 class to

acclimatise these students to groupwork, and to see what worked and what did not. This was a group of nine lower-ability students, with the majority of students have some SEN.

Research Questions

1. **What is preventing maths teachers from using collaborative activities?**
2. **What can be done to increase the use of meaningful collaboration in maths lessons**

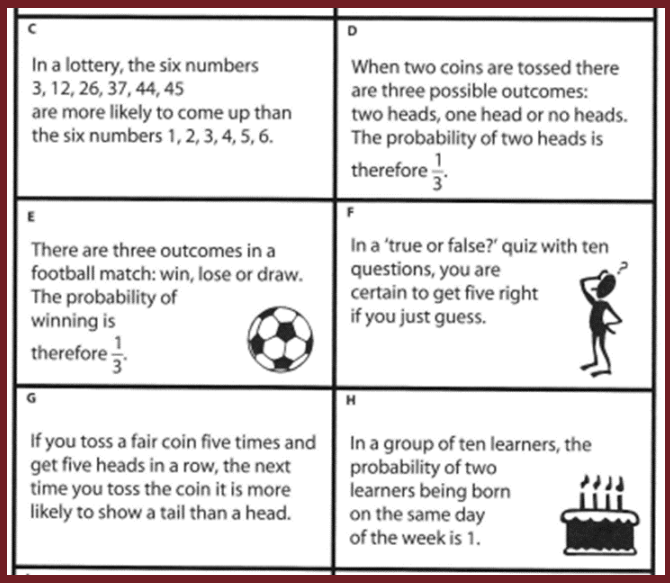
Activity 1: Straight line graphs



The first activity used was a graph matching activity. Students had already learnt how to plot straight line graphs, and how to work out the gradient using rise over run. The activity involved matching three cards: an equation, a table of values, and the graph. Students were allocated to groups of 3; arranged so that one group had a stronger member who could help lead the group to stay on task and make progress. During the lesson all groups managed to finish the matching and two moved onto the extension. in one group an individual managed to find the link and could explain this to the other members of the group. That group then presented their 'discovery' to the rest of the class. I was pleased with how this activity went, as all students were able to contribute and learn something from each other. Students felt they had agency in their learning and were enthusiastic participants.

Activity 2: Probability statements

Another activity used was a true or false probability activity. It was used as an introduction to probability. Students worked in pairs to divide the cards into three columns – true, false, and unsure. We then went through each card as a class, choosing a group to argue their case and then taking any counterarguments from the rest of the class before deciding on an answer. This was another good activity to encourage students to discuss maths and focus on convincing or proving their position to their classmates – an important concept as students move into the



GCSE and A-Level curricula. This activity was successful as the small groups gave more opportunity for each student voice to be heard. As all the scenarios were 'real-life' and tangible, students found it easier to have a position and discuss their logic. When doing this again, I will change the format of the discussion at the end - it was difficult to manage with a few voices dominating and other students losing engagement. Perhaps getting one group to 'visit' another group and discuss their answers, deciding which group was correct if they did not initially agree on certain cards.

CONCLUSIONS

I would use both of these activities again, with tweaks as mentioned. I have been encouraged to use more collaborative learning activities in my classroom; but these experiences have also reinforced the messages from the literature. Careful planning is needed to choose meaningful activities; and students must be nurtured to become effective participants in group activities. Otherwise groupwork will be detrimental where individual work could have succeeded. Shared planning initiatives within the department could help alleviate some worries over increased planning time and inability to find meaningful resources and activities. Most importantly, teachers need to start using groupwork more frequently so they can a) guide their students to participate effectively; and 2) work out what type of activities work and what extra support and measures need to be in place to get the most out of the activities and the students.

References

[1] Koutselini, Mary. "Teacher Misconceptions and Understanding of Cooperative Learning: An Intervention Study." *The Journal of Classroom Interaction* , 2008-2009, Vol. 43, No. 2 (2008-2009), pp. 34-44

[2]Nokes-Malach, Timothy J., et al. "When Is It Better to Learn Together? Insights from Research on Collaborative Learning." *Educational Psychology Review*, vol. 27, no. 4, 2015, pp. 645–656.

[3]Allen, Kasi C. "Connecting Research to Teaching: Keys to Successful Group Work: Culture, Structure, Nurture." *The Mathematics Teacher*, vol. 106, no. 4, 2012, pp. 308–312.

Collaborative Learning: Does Collaborative Learning Help to Improve Pupil's Individual Progress and Understanding in Written Responses?

ABSTRACT

This research is based upon answering the question whether collaborative learning aids pupils understanding and knowledge of technical theatre design. A year 9 class of twelve students took part in this research. At the beginning of the research, pupils were asked to individually watch videos on technical theatre design and answer the questions in their unit books. Across seven weeks, pupils were placed in groups, working together as a department to produce a final design for a whole class performance. After the performance, pupils completed a second set of questions based on technical theatre design. It was found that pupils not only were able to answer more questions than the previous, but also wrote in more depth.

Introduction

According to Nokes-Malach et al (2015), collaboration is the 'active engagement and interaction among group members to achieve a common goal'. It is the belief that working as a group is more beneficial to learning compared to working independently due to a shared workload, active engagement from all and an improved performance compared to predicted potential.

In previous schemes of work, generally the pupils in the class had written responses that were short, lacked detail and were written in note form. In addition, specific pupils have demonstrated being a 'social loafer' (Nokes-Malach et al, 2015) and therefore wished for these pupils to take on roles in order to ensure that the class remained on task so reach the end goal. This investigation was used to see if collaboration could aid pupil's progress in their terminology and improve the outcome of the length of their answers.

REFERENCE

1. Nokes-Malach, T.J., Richey, J.E. and Gadgil, S., 2015. When is it better to learn together? Insights from research on collaborative learning. Educational Psychology Review, 27(4), pp.645-656.

RESEARCH QUESTION

1. **Does collaborative learning help to improve pupil's individual progress and understanding in written responses?**

The Intervention

Pupils who participated in the intervention were tested on their understanding of technical theatre design individually. The following week, pupils were split into different groups that were arranged by the teacher based on pupil's interests in order to encourage engagement. Furthermore, the groups were created with relationships in mind. Pupils individually read, researched and created initial ideas. In the following lesson, pupils collaborated towards a single design. Pupils presented their final idea in the class performance and completed a second test on technical theatre design.

METHOD

Sample

12 Year 9 students were the primary focus for this research. Only one of these pupils in this class has chosen to take Drama for GCSE. This class have worked in their groups for seven weeks.

Design

The predominate method for this research was qualitative data through the use of closed questions in two questionnaires that were responded to individually. This was also supported by open questions through teacher feedback throughout each lesson. However, quantitive data was used to measure the length of pupils answers and the amount of time terminology was used in their answers.

Data Analysis

Qualitative data was analysed by identifying the length of pupils responses both pre and post the collaborative task, the use of terminology of pupils responses between pre and post the collaborative task and pupils application of skills to the final performance.

RESULTS

Quantitative Findings

Mean word count per answer prior to intervention	Mean score of terminology incorporated in answer prior to intervention	Mean word count per answer post intervention	Mean score of terminology incorporated in answer prior to intervention
5	1	11	2

*Figure 1: Showing the mean scores of word count and use of terminology in written answers before and after intervention

We can see from above that the mean score of the length of pupils answers have doubled as well as their success of integrating correct terminology in their answers.

Qualitative Findings

In addition, through observations of pupils working collaboratively, pupils have integrated terminology into their conversations of problem solving between and within their technical team departments alongside their skill and application of using appropriate resources.

Conclusion

It appears that collaborative learning can help assist pupils in developing their application of terminology in written answers as well as providing more detailed and lengthier written responses. What should be considered, however is the content is more engaging as it is not a performance assessment based upon acting but of technology which sustains their interest more.

The quantitive data does demonstrate that pupils were able to apply terminology successfully, however this does not necessarily mean that all pupils could identify the same term in a performance they had not contributed to.

Evaluation

The purpose of the intervention was for pupils to develop their understanding of terminology. However, it is possible that pupils have developed their understanding through the process of being a designer rather than through collaborative learning.

If I were to do this again, I would have the group do a presentation to the rest of the class, similar to a jigsaw activity, in order to demonstrate it is collaborative learning that has developed pupil's understanding.

PSYCHOLOGICAL SAFETY IN THE PHOTOGRAPHY CLASSROOM

ABSTRACT

Psychological safety plays a vital role in helping students overcome barriers to learning. How do we create a positive learning culture, when is it safe to be creative and when are new ideas likely to result in conflict? Developing and maintaining psychological safety is essential within the classroom, especially those where learning, knowledge sharing, creativity display and innovation are essential parts of learning. Due to the physical and practical nature of Photography A Level, being able to openly share ideas, take risks, ask for creative help and gain helpful input from others is vital in the development of a personal project. Students are more likely to be able to learn from mistakes and to be creative if it is normal for pupils within that particular class to show these behaviours.

INTRODUCTION

Psychological safety within a classroom ensures that students are encouraged to take risks through learning and creativity rather than in worrying about how their ideas might be received and whether it is safe to learn from their mistakes (Riddell, 2021). The lack of psychological safety is likely to result in lack of engagement within the classroom and therefore learning will be less effective. If a pupil feels as though they will be ridiculed by showing the class their Photography Coursework Project, then they will be less likely to share their work and ideas in the classroom and therefore miss out on helpful feedback from their peers and teachers.

Research suggests that positive emotions lead to positive outcomes. This is only obtainable in a positive classroom culture where students feel psychologically safe (Wang et al. 2021). If so, they actively engage in the classroom activities for a longer period of time and are more willing to be open to discussion, collaborate with others and ask for help when needed (Tu, et al, 2021). Photography A Level requires students to be extremely practical and most of the work is on display, meaning the work is constantly under scrutiny or judgement from others. It is important for the students to become familiar with gaining feedback about their work and to use this feedback to inform their next photo shoot or to even change and develop their ever-growing idea or theme within their individual projects. For this to be successful, students therefore need to feel psychologically safe to share their work, to receive the feedback and also to give feedback themselves.

METHOD

Within my two A Level Photography classes, I used specific lessons throughout the term for students to gain peer feedback within their class. The idea was that students would hopefully feel "more comfortable" and "psychologically safe" within my classroom to show their Photography projects to their class and ask for important and helpful feedback from their peers.

The first feedback session involved the students physically presenting their Photography Coursework sketchbook to the class, explaining their work and talking through their ideas and developing project. All other students in the class were asked to give feedback using the 'post-it note method'. This method involves writing short feedback on separate areas; improvement, constructive, positive and creative. The hope of this method of a peer review, is that students giving the feedback feel they can be more honest using the post-it notes and the feedback does not have to be verbal.

The second feedback session consisted of the students leaving their sketchbooks on their desk and each pupil viewed the work in a rotation, answering a 'Peer Review Feedback' form on each other - these forms were then handed in anonymously at the end of the lesson. The aim for this form of feedback was for students to not present their projects to the class themselves hopefully removing an element of stress/anxiety from the presentation. Students giving feedback could be honest due to the anonymity of the feedback and structure of the questions in the form.

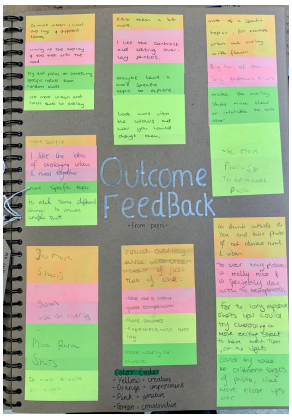
CONCLUSIONS

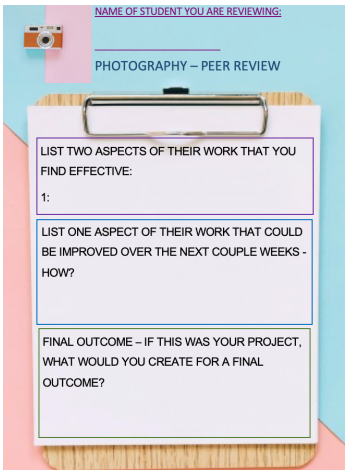
Students were much more willing to give constructive and helpful feedback to their peers when it was anonymous.

From the first feedback session, to the second session, the students had developed confidence in their class and felt safe to share their ideas and also give helpful feedback to each other on their individual projects.

In a psychologically safe environment, individuals feel safe to take risks to further their learning and thinking, to make mistakes, and ask for help and support when needed (Turner, et al, 2018).







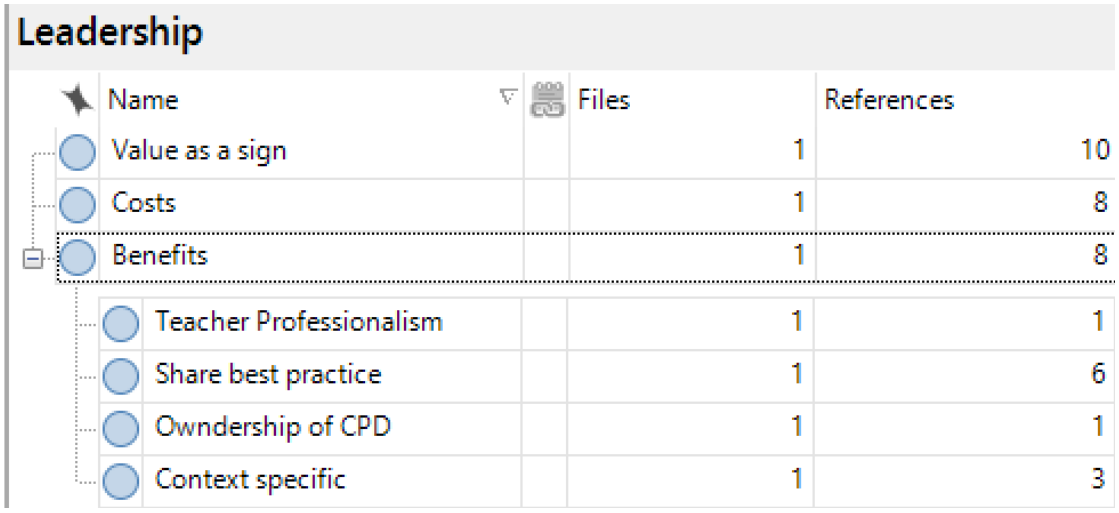
LEARNING RESEARCH JOURNAL
ISSUE 1 JUNE 2022

APPENDIX D- EXAMPLE CODING

Nodes

Name	Files	References
Challenges	0	0
Lack of motivation	2	2
Lack of new skills	1	1
Logistical difficulties	1	1
Not as good a subject specific CPD	1	1
Other challenges	2	4
Skepticism	1	1
Suggestions	6	25
Time pressure	5	15
Workload	5	10
Decision making	3	5
Intelligent Communities	3	13
Collaboration	7	25
Professional Dialogue	6	28
Sharing best practice	5	13
Pupil outcomes	4	14
Structure	4	20
Accessibility of research	3	5
Challenging research	2	2
Context Specific	5	14
Engagin In Research	4	11
Ownership	1	2
Teacher mindset	5	21
Teacher professionalism	4	9

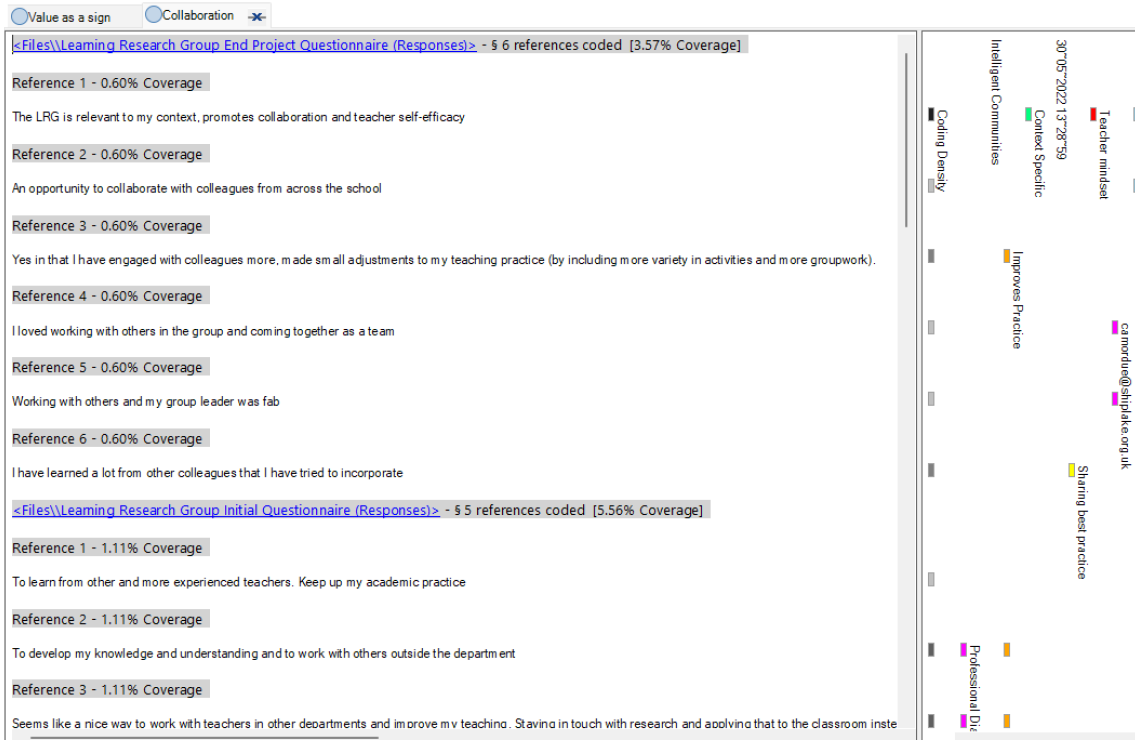
Above, codes from the questionnaires and teacher interviews



Leadership

Name	Files	References
Value as a sign	1	10
Costs	1	8
Benefits	1	8
Teacher Professionalism	1	1
Share best practice	1	6
Owndership of CPD	1	1
Context specific	1	3

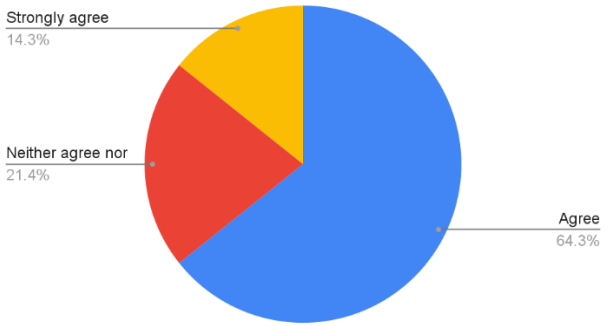
Codes from the leadership interview



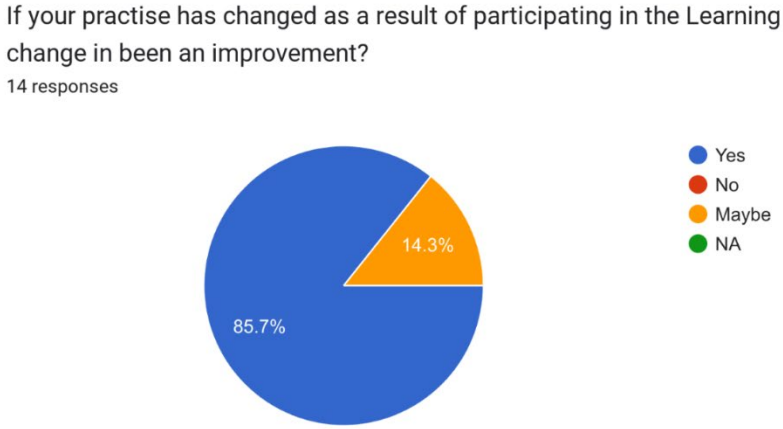
Examples of coding from collaboration code

APPENDIX E- SUPPLIMENTARY GRAPHS AND TABLES

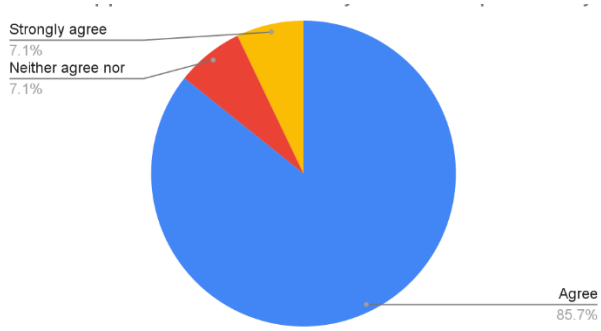
Mid-project questionnaire responses to the question, to what extent has participation in the LRG improved your practice N=15



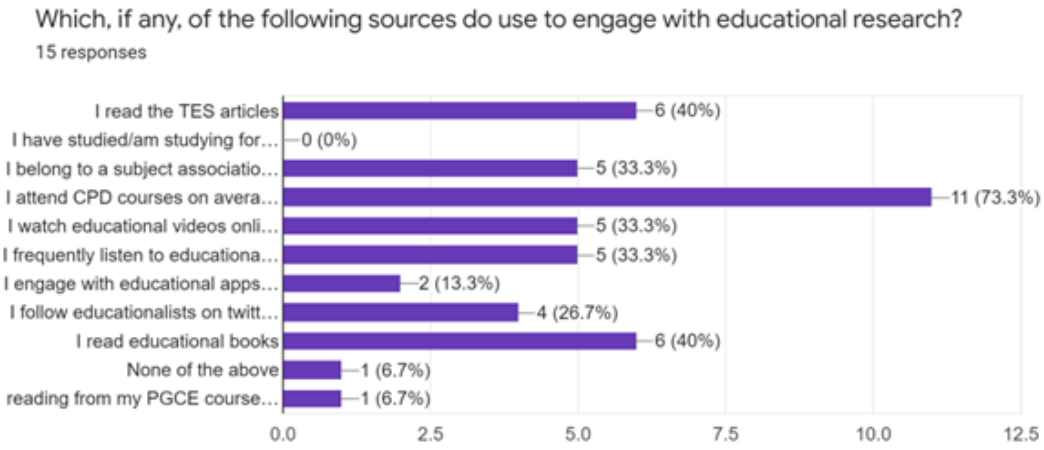
End-project questionnaire responses to the question, if your practice has changed, has that change been an improvement? N= 14



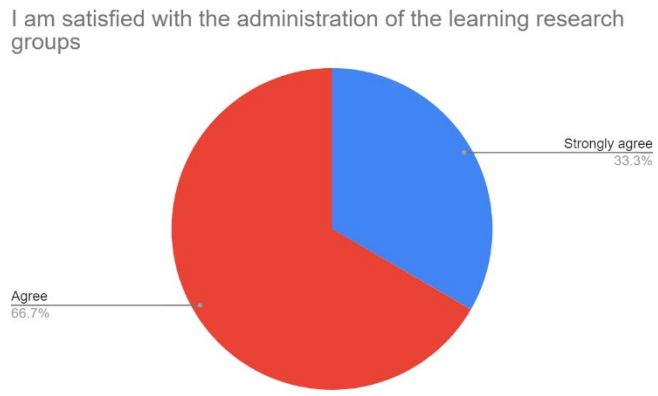
Mid-project questionnaire responses to the question, I have applied research in a way that has improved my practice. N=15



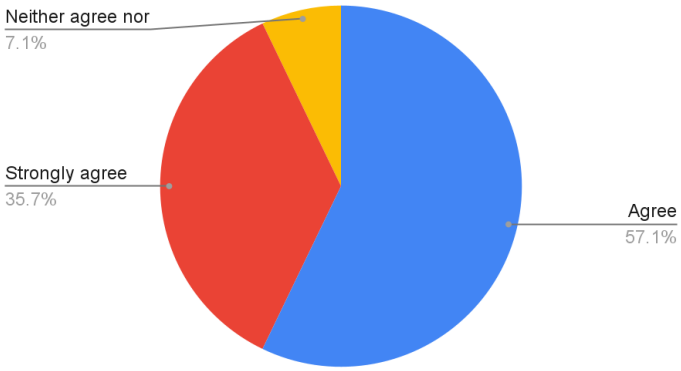
Types of research engagement in initial questionnaire



Satisfaction with administration of the LRG in the mid-project questionnaire



Satisfaction in the end of project questionnaire



APPENDIX F- CUREC

Dear [redacted],

Engaging Teachers in Research: Developing Learning Research Groups as CPD [CIA-22-098]

The above application has been considered on behalf of the Departmental Research Ethics Committee (DREC) in accordance with the procedures laid down by the University for ethical approval of all research involving human participants.

Our prior discussion on this was very useful – an impressive team as ever, and project, vastly experienced, and a model of genuine care in relation to research ethics.

I am pleased to inform you, then, that, on the basis of the information provided to DREC, the proposed research has been judged as meeting appropriate ethical standards, and accordingly, approval has been granted.

Please continue to follow all current guidance issued by CUREC during the pandemic, notably COVID-19: CUREC guidance on research involving human participants, https://researchsupport.admin.ox.ac.uk/governance/ethics/coronavirus

If relevant please also check the CUREC website for their best practice research guides, these can be very useful in refining the writing up of ethical considerations in your research – see https://researchsupport.admin.ox.ac.uk/governance/ethics/resources/bpg

Good luck with your research study,

Keep well and safe,

Yours sincerely,

All good wishes,

Liam

Chair, DREC

SECTION A: Filter for CUREC 2 application		
This section determines whether the application for ethics review should be made using this form (CUREC 1A) or the CUREC 2 form (for research with more complex ethical issues).		
Please indicate with an 'X'.	**Yes**	**No**
1. Does the research involve the deception of participants?	☐	☒
2. Are the research participants vulnerable in the context of the research, or classed as people whose ability to give free and informed consent is in question? For example, • Participants aged 16 or under (also answer question A5); • Participants aged 16 – 18 (refer to competent youths for guidance); • adults at risk; Note the University's Safeguarding Guidance and Code of Practice and its implications for researchers involving young people or adults at risk.	☐	☒
3. By taking part in the research, will participants be at risk of criminal prosecution or significant harm?	☐	☒
4. Does your research raise issues relevant to the Counter-Terrorism and Security Act (the Prevent Duty), which seeks to prevent people from being drawn into terrorism? Best Practice Guidance 07 on the Prevent Duty provides further guidance.	☐	☒
If you answered **'No'** to all the questions above, go to Section B. If you answered **'Yes'** to any question above, continue to question 5 below.		
5. Is your project covered by a CUREC Approved Procedure?	☒	☐
If yes, list the CUREC Approved Procedure(s) you will follow	MLT modus operandi	
If you answered '**Yes**' to ANY of questions 1-4, and answered '**No**' to question 5, **stop** completing this form and do not submit it for ethical review. You will instead need to submit a CUREC 2 application form. If you answered '**Yes**' to **any** of questions 1-4, and your project is covered by an Approved Procedure, **go on to Section B**. If more than one Approved Procedure applies, contact the SSH IDREC or your DREC for advice on whether a CUREC 2 form should be submitted instead.		

SECTION B: Researchers			
1. Name of Principal Investigator or student's supervisor	Supervisor: [redacted] Student: [redacted]		
2. Department or Institute	Department of Education		
3. University of Oxford email address	[redacted]		
4. Degree programme, if student research	MSc		
The whole research team			
5. Have the researchers undertaken research ethics and integrity training?	**Yes** ☒	**No** ☐	

6. Please provide details of any research ethics and integrity training undertaken, including the dates of the training. Alternatively state relevant research experience.	The research and ethics integrity training was completed in January 2022. My undergraduate degree in psychology (2007-2010) also involved ethical training and research on human participants. As a teacher of psychology (A-level) I have to teach the BPS code of ethics in conducting research.
7. State any conflicts of interest and explain how these will be addressed.	NA

SECTION C: The research project	
1. Title of the research project	
Engaging Teachers in Research: Developing Learning Research Groups as CPD	
2. Anticipated start date of the aspect of the research project involving human participants and/ or personal data (**dd/mm/yy**).	Use of data on teacher participants will commence when/if ethical approval is gained 28/2/2021
3. Anticipated research end date (**dd/mm/yy**).	16/09/2022
4. Provide a brief lay summary of the aims and objectives of the research. This should cover the questions it will answer and any potential benefits. (max 300 words)	
The aims of the research are to develop and evaluate a programme of teacher led practitioner research in schools as a form of effective professional development. The research should identify a possible approach to running practitioner research. This will consist of identifying a small number of research leads volunteering to run a group in their area of interest. Teachers wishing to take part, and early career teachers can then volunteer to one of these groups with the purpose of carrying out their own small-scale research in that area of interest. I aim to evaluate if the programme is effective in engaging teachers in carrying out their own small-scale research with their own pupils to improve their practice. I will discuss whether this is a scalable approach to CPD on a school wide level. This research will not look to breakdown the impact of individual intervention on pupil progress but teachers' engagement with the research process and its perceived benefits to their practice.	

Benefits should be in identifying best practice in engaging teachers in research. Potential impacts on pupil progress from research engaged teachers. Developing a research informed school that uses research to inform decisions at numerous levels.

5. Please indicate the methods to be used (indicate with an '**X**'):	
Analysis of existing records	☒
Snowball sampling (recruiting through contacts of existing participants)	☐
Use of casual or local workers e.g. interpreters (refer to guidance in BPG 01: Researcher safety)	☐
Participant observation	☐
Covert observation	☐
Observation of specific organisational practices	☐
Participant completes questionnaire in hard copy	☐
Participant completes online questionnaire or other online task (refer to guidance in BPG 06: Internet-mediated research)	☒
Using social media to recruit or interact with participants (refer to guidance in BPG 06: Internet-mediated research)	☐
Participant performs paper and pencil task	☐
Participant performs verbal or aural task (e.g. for linguistic study)	☐
Focus group	☒
Interview (refer to guidance in BPG 10: Conducting research interviews)	☒
Audio recording of participant (you will generally need specific consent from participants for this)	☐
Video recording of participant (you will generally need specific consent from participants for this)	☐
Photography of participant (you will generally need specific consent from participants for this)	☒
Others (please specify below)	☐

6. Provide a brief summary of the research design and methods. What will research participants be asked to do? (max 300 words) Please also submit a copy of the questions participants will be asked, if applicable, or some information about the sorts of topics that will be covered.

This research is based on an intervention that I am introducing to my school regardless of my research in the MLT course. Data will be collected throughout this intervention to evaluate its effectiveness as a CPD strategy in my school. I intend to use this data with consent of the participants to describe and evaluate learning research groups (LRGs) as my project.

Participants will have volunteered to take part in LRGs. Participation in these groups is compulsory for early career teachers in a school setting but their participation in my research is not mandatory.

Participants will complete a questionnaire at the beginning of the programme which is to identify why they have chosen to take part, what they are hoping to achieve through participation and what they anticipate will be the benefits and drawbacks of participation.

Please see questionnaires attached:

Initial questionnaire group

Participants will complete a questionnaire and interview in the middle of the research programme to discuss their progress with their research and to feedback on what they feel the strengths and weaknesses of participation have been. These will be like the questions identified attached however based around the present progress of the research.

At the end of the research participants will complete a final evaluation questionnaire which will include past tense and summary questions like those in the previous questionnaires in addition to suggested improvements to the programme.

There will be focus groups on strengths and weakness of the LRG with the research leads and the group members separately. These discussions will be based around prompt questions around personal reflections on benefits of taking part in the LRGs. How research has and may continue to influence practice. Whether the LRG has been an effective form of CPD.

Finally there will be an interview with key leaders- Headmaster, Deputy Head Academic and Assistant Head CPD regarding the scope of the LRGs as an appraisal and CPD measure.

7. List the location(s) where the research will be conducted, including any other countries.	UK		
8. Clarify which parts of the research will be conducted in-person and which will take place remotely, e.g. online.	The 3 questionnaires will take place remotely and the focus groups and interviews will take place in person covid restrictions permitting.		
9. If your research involves fieldwork or travel and your department requires a travel risk assessment, will you have completed and returned a risk assessment form beforehand? Please indicate with an '**X**'. (This must be approved by your department before you travel. If you are travelling overseas, you are advised to take out University travel insurance.) Refer to guidance available from your Department, the		Yes	☐
		No	☐
		Not required in this instance	☒

Safety Office, the Social Sciences Division, and the Humanities Division, and on travel for University business.		

10. In the case of international or collaborative research, explain how you will address any ethical issues specific to the local context. Please provide details of the local review, approval or permission obtained or required. Refer to the BPG 16: Social science research conducted outside the UK. If there will be no local review, explain why not. Please mention any stakeholder or community engagement that has been/ will be undertaken in relation to the research Please also address any physical or psychological risks for Oxford researchers and local fieldworkers in Section G.
NA?

11. Name of departmental/ peer reviewer (if applicable)	
12. External organisation funding the research and grant reference (if applicable)	NA
13. Please refer to the CUREC Best Practice Guidance and list any that have been used to develop your research.	BPG 09 BPG 10

SECTION D: Recruitment of research participants	
1. Number of participants	Approximately 20 Participants will take part in this research
2. How was the number of participants decided?	Participation in the learning research group is voluntary and with the pressures and workload in my educational context numbers are likely to be limited. This number accounts for the number of volunteers with some room for attrition with the additional participation of senior leaders in the interviews. The number should allow for detailed but not overwhelming qualitative analysis.
3. Age range of participants	22-50
4. Inclusion criteria	Member of teaching staff in my place of work.
5. Exclusion criteria	

<table>
<tr><td rowspan="9">6. Indicate with an 'X' all intended recruitment methods
Please submit copies of the recruitment material that will be used, e.g. advertisement text, introductory email text.</td><td>Poster advert</td><td>☐</td></tr>
<tr><td>Flyer</td><td>☐</td></tr>
<tr><td>Email circulation</td><td>☒</td></tr>
<tr><td>Social media (e.g. Twitter, Facebook)</td><td>☐</td></tr>
<tr><td>Website</td><td>☐</td></tr>
<tr><td>In-person approach</td><td>☒</td></tr>
<tr><td>Snowball sampling</td><td>☐</td></tr>
<tr><td>Recruitment sites (e.g. Mechanical Turk)</td><td>☐</td></tr>
<tr><td>Existing contacts or volunteer database</td><td>☒</td></tr>
<tr><td>Other (please specify):</td><td>☐</td></tr>
<tr><td>7. How will potential participants be identified and approached?</td><td colspan="2">A teaching staff email will be used to ask for volunteers with a research interest to lead a group. Members of staff with experience in research or involvements with previous learning communities in school will be asked directly if they would like to participate. During INSET day the teaching body will be given a presentation on the plan for the learning research group, they will then have the option to sign up via a google form. Early career teachers must take part in the LRG but it is not mandatory for them to take part in my research.</td></tr>
<tr><td>8. Will informed consent be obtained from the research participants or their parents/ guardians? If not, please explain why not.</td><td colspan="2">Upon ethical approval all members of the LRG and those interviewed on its completion will be asked to complete a consent form for their data and future data to be used in this research.</td></tr>
<tr><td>9. For each activity or group of participants, explain how informed consent will be obtained from the participants themselves and/ or their parents/ guardians, if applicable. How will their consent be recorded?

Please submit copies of all participant-facing materials for review. E.g.:
• Recruitment material (e.g. emails, posters)
• Information for participants to read (or hear) before they agree to take part (e.g. written information or, if applicable, an outline oral information script).</td><td colspan="2">Upon ethical approval a letter will be sent to the headmaster confirming his consent for research to take place for this project at my place of work.

Participants will be sent a consent form upon ethical approval for their data to be used in this research project. This will consist of a summary of the research in brief 'To report on and evaluate the learning research group programme as a model for CPD' it will be made clear that data will be anonymised, confidentiality protected and that participants may withdraw at anytime up to the date in section D.</td></tr>
</table>

• A document to record informed consent. Further guidance and templates.	Record of consent will be stored digitally in a google sheet. Consent forms will be stored securely.
10. Provide details of any payments and incentives and the rationale for providing these. Further guidance in Best Practice Guidance: 05 Payments and incentives in research.	None
11. Describe how participants • may withdraw from the study • may withdraw any personal information they have provided from the study State any limits to withdrawal, for example once the data has been anonymised or at some other specified stage prior to publication. Make sure participants are aware of any withdrawal limits.	All participants may withdraw from the study at any point. This will be made clear in the consent form, and this will be clarified prior to the internal publication stage of LRG findings and again at the completion of the LRG cycle. No personal information will be collected about any of the participants.

SECTION E: Research data
All information provided by participants is considered research data for the purpose of this form. Any research data from which participants can be identified is known as personal data; any personal data which is sensitive is considered special category data. Management of personal data, either directly or via a third party, must comply with the requirements of the UK General Data Protection Regulation (UK GDPR) and the Data Protection Act 2018, as set out in the University's Guidance on Data Protection and Research. In answering the questions below, please also consider the points raised in the Data Protection Checklist and Data Protection Screening Assessment and whether, for higher-risk data processing, a separate Data Protection Impact Assessment may also be required for the research. Advice on research data management and security is available from Research Data Oxford and your local IT department. Advice on data protection is available from the Information Compliance team. For guidance on conducting internet-mediated research, refer to CUREC's Best Practice Guidance 06: Internet-mediated research.
1. What data will be collected? (Indicate with an '**X**')

Screening documents	☐	Task results (e.g. questionnaires, diaries)	☒
Consent records (e.g., written consent forms, audio-recorded consent, assent forms)	☒	IP addresses (refer to Best Practice Guidance 09: Data collection, protection and management for guidance)	☐
Contact details for the purpose of this research only	☐	Field notes	☐
Contact details for future use (guidance)	☐	Photographs	☒
Opt-out forms	☒	Information about the health of the participant (including mental health)	☐
Audio recordings	☐	Previously collected (secondary) data	☐
Video recordings	☐	Data already in the public domain. Specify the source of the data:	☐
Transcript of audio/ video recordings	☒	Other, please specify:	☐

2. During the course of the research, where will **each type of** research data be stored?	**Task Results** Responses from the google form will be stored on the college's google drive account- This is a password secured drive with 2 factor identification. Data will also be stored on my personal, password secured laptop. **Consent records and opt out forms** These will be stored on the college's google drive account- This is a password secured drive with 2 factor identification. Data will also be stored on my personal, password secured laptop. The drive will be deleted if I leave my current place of work, otherwise they will be stored for 3 years. If I leave the personal records will be stored for 3 years. **Transcripts** Transcripts will be stored on the college's google drive account- This is a password secured drive with 2 factor identification. Data will also be stored on my personal, password secured laptop. **Photographs** Photographs of the poster will be stored on the college's google drive account- This is a password secured drive with 2 factor identification. Data will also be stored on my personal, password secured laptop.

3. Who will have access to the research data during the project?	Dr [redacted] my course supervisor will have access to the data. The research group leads will have limited access to the data in terms of the initial sign-up responses, and access to task data from their research group. Participants will be anonymised using pseudonyms		
4. Please complete this section if your research involves the use of secondary (i.e. previously collected) data.	**Please indicated with an 'X'.**	**Yes**	**No**
	Are data access agreements in place for access to and use of this secondary data? (If so, please attach these.)	☐	☐
	Did the individuals agree that their data could be used for this purpose?	☐	☐
	Could anyone (including members of the research team) link the data back to an individual or individuals? If this is a possibility, please explain how the associated ethical issues will be addressed:	☐	☐
5. How do you intend to share the research data at the end of the project?	Depositing in a specialist data centre or archive	☐	
	Submitting to a journal to support a publication	☐	
	Depositing in an institutional repository	☐	
	Dissemination via a project or institutional website	☒	
	No plans to share the data	☐	
	Other (please specify): • In a presentation as part of a poster conference at the Department for Education. • In a presentation to my school's governing body. • In a presentation to colleagues at INSET day	☒	
6. How do you intend to report and disseminate the results of the research? (Indicate with an 'X')	Thesis publication	☐	
	Publication in a peer reviewed journal	☐	
	Publicly available report	☐	
	Conference presentation	☐	
	Publication on a website	☐	
	Pre-registration	☐	
	Report to a research funder	☐	
	Providing participants with a lay summary of the results	☐	
	Submission for academic assessment	☒	
	Other (please specify):		

	• In a presentation as part of a poster conference at the Department for Education. • In a presentation to my school's governing body. • In a presentation to colleagues at INSET day	☒

7. Explain what will happen to the data at the end of the research project. This question must be answered for each type of data, including completed consent forms.
There is no personally identifiable data stored beyond consent forms. This will be kept in the password protected drive and on my personal password protected laptop for 3 years before being deleted and the 'trash' permanently deleted.

SECTION F: Protection of research participants and their personal data		
1. How identifiable will the participants be from the **research outputs**? (Indicate with an 'X')	Directly identifiable from the information included	☐
	Pseudonymised/ indirectly identifiable	☒
	Not identifiable – data is anonymous	☐
	Other, please specify:	☐
2. To what extent will the **data** be de-identified? How identifiable will any individuals be from the research data? Describe any measures you will take towards assuring confidentiality, potential risks to confidentiality.	Individuals will be given a pseudonym and so will not be directly identifiable. Limited detail will be given about the location of my college to further protect the identities of those staff taking part.	
3. How will you ensure that third parties (e.g., interpreters and transcribers) are aware of and adhere to the measures	There will be no third-party involvement.	

described in this form?	

SECTION G: Risks and benefits of the research
1. Will the research involve topics that could be considered sensitive? If so: a. Please provide more detail or supporting information (such as the interview questions) to show the range of questions; b. Explain what steps will be taken to reduce risk of distress; c. Consider seeking advice from within your Department or from the ethics committee including whether the application might benefit from additional ethics review (e.g., via a CUREC 2 application).
Not applicable
2. Describe any additional burden or risks to the participants and the steps you will take to address these.
Time pressures: Meetings, lesson observations, interviews and questionnaires will take up time for the participants. Giving plenty of notice for meetings (via email) and flexibility when arranging lesson observations and meetings should keep additional burden to a minimum. Participants may withdraw at any time.
3. Describe any physical or psychological risks to the researcher(s) (including local fieldworkers or research assistants) and the steps you will take to address these.
NA
4. Describe any benefits of the research, both to participants and to others.
Benefits to the research include • Experience of taking part in practitioner research • Collaboration with likeminded individuals • Participation in learning research group • Research support with group leads and members • Context specific CPD • Can use project as evidence of CPD for internal appraisal process
5. Give details of any other ethical issues or relevant information.
NA

SECTION H: Professional guidelines		
Please indicate with an '**X**' at least one set of professional guidelines you will follow.		
Research specialism/ methodology	**Association and guidance**	
Anthropology	Association of Social Anthropologists of the UK	☐
Computer Science	ACM Code of Ethics and Professional Conduct	☐
Criminology	British Society of Criminology Statement of Ethics	☐
Education	British Educational Research Association Ethical Guidelines for Educational Research	☒
Geography	American Association of Geographers Statement on Professional Ethics	☐
History	Oral History Society of the UK Ethical Guidelines	☐
Internet-mediated research	Association of Internet Researchers Ethical Guidelines British Psychological Society: Ethics Guidelines for internet-mediated research Association for Computing Machinery Code of Ethics and Professional Conduct	☐
Management	Academy of Management Code of Ethics	☐
Political Science	American Political Science Association (APSA) Guide to Professional Ethics in Political Science	☐
Politics	Political Studies Association. Guidelines for Good Professional Conduct	☐
Psychology	British Psychological Society Code of Ethics and Conduct	☐
Social research	Social Research Association: Ethical Guidelines	☐
Socio-legal studies	Socio-Legal Studies Association: Statement of Principles of Ethical Research Practice	☐
Sociology	The British Sociological Association: Statement of Ethical Practice	☐
Visual research	ESRC National Centre for Research Methods Review Paper: Visual Ethics: Ethical Issues in Visual Research	☐
Other professional guidelines		☐

SECTION I: Endorsements and signatures

Please ensure this form is endorsed by the Principal Investigator (or student's supervisor), the Head of Department (or nominee) and, if student research, by the student themselves. **The SSH IDREC Secretariat accepts either option below. If you have a DREC, check which signature option it prefers.**

- **Option 1: direct email endorsements**

Each of the signatories should submit an email from a University of Oxford email address, indicating their acceptance of the responsibilities listed below.

- **Option 2: signatures**
  Please scan the signed form and email it to us as a PDF. Pasted images of signatures cannot be accepted.

Endorsement by the Principal Investigator/ student supervisor and student, if applicable

I/ we the researchers understand my/ our responsibilities as Principal Investigator (and student, if applicable) as outlined in the guidance on the CUREC website. I/ we declare that the answers above accurately describe the research as presently designed, and that the ethics committee will be informed of any changes to the project which affect the answers to this form.
I/ we will inform the relevant IDREC if the Principal Investigator changes.

Name of Principal Investigator	[redacted]
Principal Investigator's signature	Instead of a signature, endorsement may be provided by an email confirming the points above.
Date	18/01/2021
Name of student (if applicable)	[redacted]
Student's signature	Instead of a signature, endorsement may be provided by an email confirming the points above.
Date	18/01/2021

Departmental endorsement – from the Head of Department or nominee
(Another senior member of the department may sign where the head of department is the Principal Investigator, or where the Head of Department has appointed a nominee. Example nominees include Deputy Head of Department, Director of Research, or Director of Graduate/ Undergraduate Studies.)

On the basis of the information available to me, I confirm that:

- I am aware of the research proposed and have read this application;
- To the best of my knowledge, the proposed design and scientific methodology do not raise ethical concerns;
- I support this research in principle, subject to ethical and other necessary reviews.

Signature	Instead of a signature, endorsement may be provided by an email confirming the points above.
Name	
Role	
Date	