Independent learning: a literature review and a new project

W R Meyer, Evaluation and Research Department, LSN

Paper presented at the British Educational Research Association Annual Conference, University of Warwick, 1-4 September 2010

Abstract

The concept of 'independent learning' is associated with, or part of, a number of other educational concepts and wider policy agenda of contemporary relevance such as 'personalised learning', 'student-centred learning' and 'ownership' of learning. It has been seen as one of the essential elements of 'personalised learning' and as vital to the continuing development of a system of school education that promotes high quality and lifelong learning and social equity and cohesion.

In 2008 LSN was commissioned by the Department for Children, Schools and Families (DCSF) to carry out a review of literature in the field of independent learning. Employing a mixed-method approach guided by a combination of the principles of 'systematic review' and 'realist synthesis', the review explored the concept of independent learning and its possible impact on pupils.

In identifying reliable, robust and relevant research to develop a detailed picture of the different aspects of independent learning, the review investigated the key elements and models of independent learning, the skills required by teachers and learners to make the concept a reality, the role of assessment in independent learning, the impact of independent learning, and the challenges to its implementation and how they might be managed.

This paper describes the key findings of the literature review and considers an exploratory LSN research study which developed out of the review.

The literature suggested that key elements of independent learning may be comprised of factors which are internal and external to learners. The external

elements include such areas as the development of a strong relationship between teachers and pupils and the establishment of an ‘enabling environment’ in which ICT has a part to play. The elements that are internal are the skills - cognitive, metacognitive and affective - that individual pupils have to acquire.

In building a definition of independent learning, however, the key may be said to be a shift of responsibility for the learning process from the teacher to the pupil. This shift in responsibility involves pupils having an understanding of their learning, being motivated to learn and collaborating with teachers to structure their learning environment.

The literature indicated that pupils do not become effective independent learners by themselves. Rather, pupils need to learn how to learn, indicating that effective ways to learn can and should be promoted by teachers.

The promotion of independent learning requires a new role for teachers, which is based not on the traditional transmission of information but on process-oriented teaching, which ensures that pupils are actively involved in the learning process and become lifelong learners: where effective, independent learning depends on productive interactions between pupil and teacher. The promotion of independent learning however is most effective when a whole school approach is taken and teachers are supported by senior managers.

In essence, when such beneficial factors combine, the impact of independent learning has been seen as positive. Many authors claim that the introduction of independent learning has led to improved test scores and wide-ranging benefits for pupils. These benefits seem to have a specific impact on particular groups of pupils, such as boys and girls; gifted pupils (pupils whose abilities are developed to a level that is significantly ahead of their year group); pupils with special educational needs; and ‘socially excluded’ children (children who are excluded from social participation because their living standards are below those of their peers).

The literature review undertaken for the DCSF dealt entirely with school education. The concept of independent learning is, however, increasingly to the fore in further

education (FE). There has recently been much debate about structural and financial changes designed to shift power to the learners in FE. Forthcoming LSN research aims to investigate how this process might be taken forward at the level of teaching and learning by looking at existing models of alleged good practice and considering how independent learning might be fostered and promoted in FE.

Purpose

Two years ago LSN was commissioned by the Department for Children, Schools and Families to carry out a review of literature in the field of independent learning, specifically as it related to school education in this country. Employing a mixed-method approach guided by a combination of the principles of 'systematic review' and 'realist synthesis', the review explored the concept of independent learning and its possible impact on pupils.

In identifying reliable, robust and relevant research to develop a detailed picture of the different aspects of independent learning, the following research questions were explored:

- What are the key elements of independent learning?
- Are there different models of independent learning, and, if so, what are they?
- What skills are required for effective independent learning?
- How can teachers best support the development of independent learning skills?
- What kinds of processes need to take place to encourage the learner to become an independent learner?
- What other conditions need to be in place?
- What is the role of assessment, particularly peer- and self-assessment, in independent learning?
- What is the role of ICT in independent learning?
- What is the effect of independent learning on pupil outcomes?
- Do pupils become more confident in their learning when using self-help

strategies?

- What are the stages in progression in independent learning?
- What are the challenges of independent learning and how can they be managed?
- What are the pedagogical issues surrounding independent learning skills?

The literature review undertaken for the DCSF dealt entirely with school education. The concept of independent learning is, however, increasingly to the fore in further education (FE). There has recently been much debate about structural and financial changes designed to shift power to the learners in FE. Forthcoming LSN research aims to investigate how this process might be taken forward at the level of teaching and learning by looking at existing models of alleged good practice and considering how independent learning might be fostered and promoted in FE.

Introduction

The concept of 'independent learning' is associated with, or part of, a number of other educational concepts and wider policy agenda of contemporary relevance such as 'personalisation', 'child- or student-centred learning' and 'ownership' of learning. It is a feature of important issues such as pupil–teacher roles and relationships and the role of information and communications technology (ICT) in learning. Theoretical study and practical application of the principles of independent learning are perhaps most advanced in the U.S., but the concept is of increasing significance in the UK. It is one of the essential elements of 'personalised learning', and has been seen as vital to the continuing development of a system of school education that promotes high quality and lifelong learning and social equity and cohesion (DfES, 2006).

An understanding of how learners learn, both in terms of theories of cognition and their practical application, is crucial to developing strategies aimed at improving the capacity for independent learning. This contention is supported by a large body of literature - for instance, the US-based Bransford *et al.* (2000) and Schunk (2005) and the UK-based Reynolds *et al.* (2002), Huddleston and Unwin (2002) and Higgins *et al.* (2007). These and other writers have shown how new information from many

branches of science has added to our understanding of what it means to know; from the neural processes that occur during learning to the influence of culture on what people see and absorb. The issue of learning styles, originating from the work of the US-based Gardner (1983), is relevant here, though enthusiasm must be tempered by the severe qualifications made by the UK-based White (1998) and Coffield *et al.* (2004).

It is not, however, only the process that matters. To be of value, an educational theory must in its practical application have outcomes that are demonstrably beneficial. Here again, most of the research showing measurable outcomes derives from the US (Schunk and Zimmerman, 1994; Zimmerman, 2002). In the UK, the 'Learning How to Learn' project (Teaching and Learning Research Programme, 2008) and the Institute of Education's EPPI-Centre Thinking Skills Review Group (EPPI-Centre, 2004; EPPI-Centre, 2005) have looked at outcomes of independent learning and the latter's literature reviews indicate that thinking skills programmes and approaches have a considerable and positive impact on measurable pupil performance. However, it is not necessarily possible to isolate achievement gains due to independent learning from those that may be due to some other factor or a combination of factors (EPPI-Centre, 2004).

Qualitative outcomes - those to do with motivation and morale, for instance - are also claimed as benefits of independent learning (Griffith, 1998; Williams, 2003). These outcomes may be important in themselves in terms of enabling pupils to function adequately as members of society both as children and, in the future, as adults. They are also a prerequisite and an accompaniment to the strictly educational outcomes (Zimmerman, 2002).

Many schools in England and Wales identify the development of pupils' independent learning skills as an aim in their school development plan. But it is not always clear what is meant by 'independent learning', how it works in practice, or how teachers might best foster it. Questions also surround the issues of the benefits and challenges of independent learning and how it can be made inclusive.

Policy context

Over the past twenty years or so concern about formal education and its outcomes has been prevalent in Europe, North America and beyond (Boekaerts, 1999). Independent learning has been one of the approaches explored by national governments and educators as a means of improving educational outcomes. It also contributes to satisfying demands for greater personalisation and inclusivity. In the UK, the broad issue of personalisation has run rather ahead of the specific issue of independent learning as a matter of policy debate and formulation, but where the details and implementation of personalisation do feature in policy documents and statements the need to promote and develop independent learning is not always recognised as an important, indeed essential, part of a personalised scheme.

The booklet from the Department for Education and Skills (subsequently the Department for Children, Schools and Families; and subsequently still the Department for Education) *A national conversation about personalised learning* (DfES, 2004a), in laying out what should be done in the classroom to facilitate personalised learning, stated that children should be motivated 'to become independent, e-literate, fulfilled lifelong learners' (DfES, 2004a, p7). The roles of teachers, schools, school governors and central and local government in managing and providing the conditions and infrastructure for independent learning and the other, linked, components of personalised learning - notably choice, assessment for learning and student and parental voice - are underlined and the argument is advanced that implementation of this policy will lead to 'the shared goals of high quality and high equity' (DfES, 2004a, p7).

The National Conversation document noted that for effective teaching and learning to take place in a personalised system it will be necessary to 'instil key learning skills and accommodate different paces of learning' (DfES, 2004a, p9). As examples of approaches that might be adopted, the document cites a school in which teachers assist children to take control of their own learning by setting with them realistic learning challenges such as re-designing the school grounds and evaluating the results of their efforts; and another school in which teachers help the children to identify and develop their learning skills and then structure their lessons according to

how pupils will most effectively learn.

Neither of the two important White Papers, *Higher standards, better schools for all* (DfES, 2005a) and *14-19 education and skills* (DfES, 2005b) makes direct mention of independent learning, though both regard personalised learning - seen in terms of appropriately tailored curricula and opportunities for individual pupils and other demand-led features - as crucial to the success of education in the future.

The report of the Teaching and Learning in 2020 Review Group (DfES, 2006), with its emphasis on personalised learning, stresses, both implicitly and explicitly, the association of independent learning with the personalised approach. Though the report recognises that primary and secondary schools face different challenges in personalising learning because of the different stages pupils are at in their learning journey, it nonetheless envisages a future in which *all* children have an appropriate degree of 'ownership' of their learning and advocates the personalised learning 'mix' of assessment for learning, learning how to learn and pupil voice as the best means of developing all aspects of learning.

The teaching of 'thinking skills' is already an explicit part of the National Curriculum in England and Wales and has made a direct contribution to initiatives such as *Teaching and learning in the foundation subjects* (DfES, 2004b) and *Leading in learning at Key stage 3* (DfES, 2005c), which emphasise the importance of thinking skills approaches to developing pupils' oral and questioning skills. Thinking skills are also an important part of the Primary National Strategy Aims (DfES, 2004c).
The important role that ICT can play in developing independent learning is stressed in the report of the Teaching and Learning in 2020 Review Group (DfES, 2006), and in the e-learning strategy document, *Harnessing technology* (DfES, 2005d).

The wish of the Blair and Brown governments to give impetus to a move towards independent learning as part of the personalisation agenda was, at least in terms of government rhetoric, clear. The policy of the Coalition government elected in May 2010 has not been so clearly stated. The Secretary of State for Education, Michael Gove, has thus far (September 2010) put the emphasis on value for money, freeing schools from external controls and restoring discipline in schools and integrity to the

examinations system. Mr Gove has, however, previously expressed himself as a proponent of personalised learning [it meant 'stretching the most talented and nurturing the weakest'] (*Times*, 10 July 2007); and it may be that, if only through the eye of faith, he will come to see an association between independent learning and some of his favourite philosophies and schemes.

The extent to which independent learning is possible in practice under subsisting conditions has been questioned in the literature. Thus, Williams (2003) points to what she sees as the paradox of increasing prescription through the National Curriculum at the same time as the policy of promoting independent learning. Teachers, she argues, are being asked to help their pupils develop as independent learners in the face of a curricular regime based on an input/output model that may be thought to leave little time for independent thinking or action. Bullock and Muschamp (2006) take up this theme but hold that the practical development of independent learning is, nonetheless, possible under present conditions and is in fact already a growing tendency in primary schools.

Methodology

The mixed-method approach used for the literature review allowed for a rigorous approach to the selection of material through the use of inclusion and exclusion criteria and an agreed research focus, which is part of the systematic review methodology, to be combined with the flexibility afforded by the realist synthesis approach (Pawson *et al.*, 2004). The realist synthesis approach ensures that the process of reviewing the literature is rigorous and iterative. It makes possible the refinement of findings emerging from the synthesis of literature examined and the addition of evidence at each iteration of the review.

Systematic review theory describes a hierarchy of evidence: the higher up a methodology is ranked, the more robust and closer to the objective truth it is held to be. Thus, systematic reviews and meta-analyses (fresh analyses of data from existing studies) are at the top of the hierarchy, followed by studies resting on randomised controlled trials and those describing cohort studies. Further down the hierarchy, in descending order are case-control studies, cross-sectional surveys,

case reports, expert opinion and anecdotal evidence. This ranking has an evolutionary order, from simple observational methods at the bottom to increasingly sophisticated and statistically refined methodologies at the upper end.

The randomised controlled trial is regarded as the most objective method of removing bias and producing reliable and replicable results. The nature of educational research is not favourable to the use of randomised control methods. Research and studies based on this methodology occur infrequently in the literature on independent learning. Therefore, most of the studies described and analysed in the review were further down the hierarchy of evidence than any that might rely on randomised controlled trials. Most were cohort studies (groups selected on the basis of their exposure to a particular intervention and followed up for specific outcomes), case-control studies (groups experiencing the intervention are matched with ones that have not experienced it and a retrospective analysis is used to look for differences between the two groups), or simple case studies.

In giving weight to the evidence presented in the review, account was taken of hierarchy of evidence principles. But this hierarchical approach to evidence utilisation was tempered by the principles underpinning 'realist synthesis', which allow for an iterative building of the evidence base.

The results of the review, therefore, combined the rigour of the systematic review process and the flexibility in evidence development provided by realist synthesis, and provided a basis for a consideration of the implications of independent learning in the classroom and in terms of its practical promotion.

As a first step, the focus and parameters of the review were decided. This included identifying and agreeing the inclusion and exclusion criteria to determine the selection of studies. These inclusion and exclusion criteria were as follows:

- Only literature published from 1988 onwards was included, with the exception of seminal literature.
- Only literature published in the English language was considered, including international literature in English.

- The study population was children of compulsory school age.
- Topics of interest were broadly taken as independent learning, thinking skills, learning how to learn, ICT-assisted learning, self-regulated learning, and expert learning.
- The material to be reviewed was defined as published research, UK government policy reports, systematic and meta reviews, grey literature (e.g., conference proceedings, guidance documents, material on websites), material from relevant organisations, and articles found in specialist journals by hand-searching.

A search strategy was devised for each component of the review, including identification of key words and search terms and of key databases for published and unpublished research. Specific journals targeting the topic under review and the websites of relevant organisations were also identified.

Database searches (including DIALOG, EBSCO, COPAC and IDOX) were conducted and texts were either downloaded, or, where not available electronically, consulted in a research library or ordered from the British Library. Publications selected were recorded on an EndNote programme.

A framework to develop the analytical review of material accessed through the searches and to explore terms and definitions was developed:

- What is independent learning? - Elements, models, skills required.
- How can teachers promote independent learning? - What works best, kinds of processes, other conditions, stages in progression.
- What is the role of assessment? - Peer assessment, self-assessment.
- The effects of independent learning - On pupil outcomes, on confidence, on motivation.
- Challenges of independent learning, how to manage these.
- Pedagogical issues.
- Information and Communications Technology (ICT) - role, impact.

The retrieved studies were critically reviewed and assessed for quality and relevance. The material was then synthesised in accordance with the model of the analytical framework outlined above.

Next, key findings and themes were refined using realist synthesis principles so as to ensure as comprehensive an assessment of the available material as possible. Further searching, reviewing and synthesis took place as necessary to establish an overview of the key findings.

Defining independent learning

A number of different terms are used to describe independent learning, the most common being 'self-regulated learning'. All these different terms describe very similar themes and processes, including pupils having an understanding of their learning; being motivated to take responsibility for their learning; and working with teachers to structure their learning environment (see, for instance, Candy, 1991; Gorman, 1998; Bates and Wilson, 2002; and Perry *et al*., 2006).

There is a consensus in the literature that independent learning does not involve pupils merely working alone. Instead, the important role teachers can play in enabling and supporting independent learning is stressed. Typically, UK and international writers make a contrast between the 'dependent' and the 'independent' learner (Alexander et al, 1992; Boekaerts, 1997; Williams, 2003). The dependent learner is a passive recipient of knowledge, or at least of teaching: he or she accepts the teacher as the expert in the learning process and sees his or her own role as subsidiary or dependent. By contrast, the independent learner is active in directing and regulating his or her own learning and is him/herself a learning expert. Winne and Jamieson-Noel (2002) see the ability to fuse information processed and information processing without teacher intervention as setting the independent apart from the dependent learner.

Independent learning is generally seen as a direction for the process of education, not an absolute standard. As the UK and international literature has generally

suggested, particularly when focusing on the practical perspective, there are different degrees of independence in a continuum from the dependent to the independent learner (Bereiter, 2002; Ertmer and Newby, 1996; Boekaerts, 1997). The dynamic of the continuum is a shift in responsibility between learner and teacher, so that by degrees the learner assumes greater responsibility for directing his or her own learning and negotiating strategies and processes with the teacher. For movement to take place along the continuum, together with the transfer of responsibility there must be a development of independent learning skills by the child.

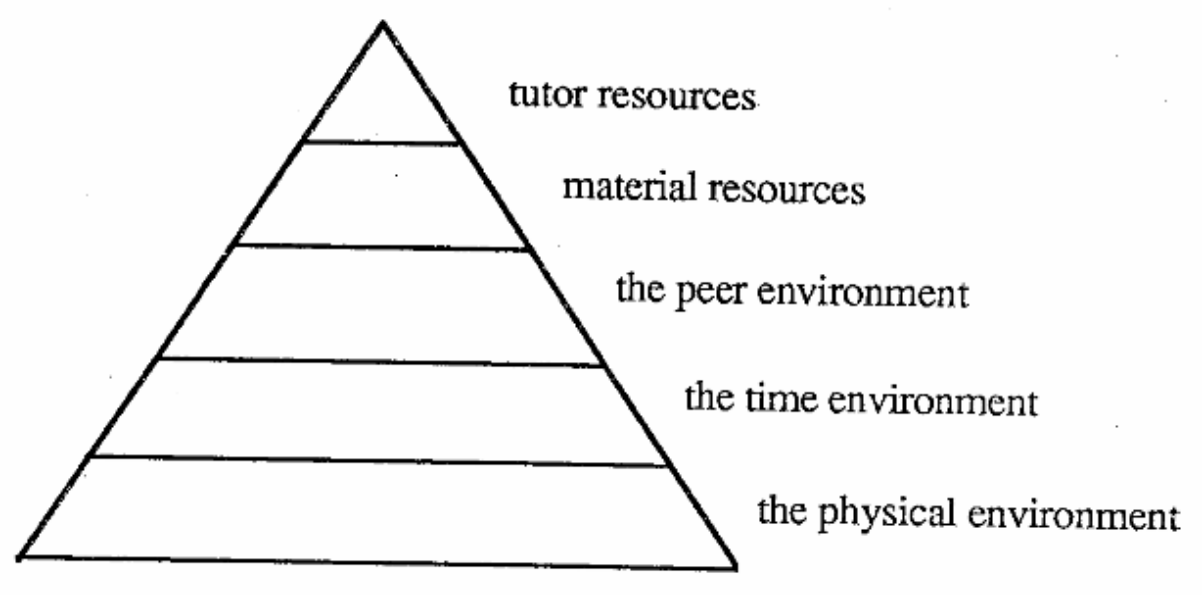
There are a number of different ways of defining and describing independent learning, without there being a shared understanding of how these different definitions and descriptions relate to one another. The literature works with different definitions and this may make it difficult for policy-makers and practitioners to find clear guidance.

Key elements of independent learning

The literature suggests that the key elements of independent learning may comprise factors that are internal or external to learners. The external elements are the development of a strong relationship between teachers and pupils (Kesten, 1987; Alexander *et al*., 1992; Boekaerts, 1997; Bates and Wilson, 2002; and Williams, 2003) and the establishment of an 'enabling environment' (MacBeath, 1993; Gorman, 1998; Williams, 2003).

MacBeath proposes a hierarchy of environmental support that is needed for independent learning. The enabling 'physical environment' is the base of this hierarchy since 'without this nothing is feasible' (MacBeath, 1993, p9). The 'physical environment' refers to the environment in which independent learning takes place, such as a library or a classroom. Following this base is the 'time environment', which can be used and controlled by teachers. The 'time environment' may therefore refer to the length of time teachers give pupils to work on specific tasks. Then there is the 'peer environment' whose norms and expectations may increase or decrease pupils' willingness and ability to undertake independent learning. This is followed by the 'material resources', which refer to study aids such as books and audio tapes.

Finally, at the top of the hierarchy are the ‘tutor resources’, which refer to the traits, knowledge and skills of teachers, tutors and mentors.



While the use of ICT is not mentioned explicitly as part of MacBeath’s hierarchy of support, its importance is implied at all levels. There is an implicit assumption that ICT is an essential component of this enabling environment. The ‘physical environment’ in schools is being increasingly equipped with many forms of ICT, such as the internet, electronic whiteboards, computers with various software, and mobile devices. Similarly the ‘time environment’ and the ‘peer environment’ are likely to be influenced by ICT since teachers and pupils are able to communicate by various means, including electronically and physically. This may provide more flexibility in the time pupils have for learning and how they perceive learning. The ‘material resources’ are inevitably based on ICT, with pupils more likely to use an internet library than a physical library when searching for information. The ‘tutor resources’ are also likely to be influenced heavily by ICT since teachers’ knowledge and skills are enhanced and developed through ICT.

The part that ICT has to play in learning is widespread throughout the UK literature although its role in relation to independent learning is generally implicit (Hinds, 2007; Malone and Smith, 1996; Wilson, 2000). There is a wealth of international literature documenting the importance of ICT for independent learning (Mok and Chen, 2001;

Peet, 2000; Lim and Chai, 2004; Stefansson, 2004). Most of this literature focuses on work carried out in East Asia and North America, and may therefore not be directly applicable to the UK. However, since the principal elements of independent learning remain identical across countries, this literature may pave the way to a better understanding of how ICT can support and promote independent learning in the UK.

The internal elements of independent learning are the skills that individual learners have to acquire to progress towards independent learning. These are cognitive skills, metacognitive skills and affective skills. Cognitive skills include memory, attention and problem-solving. Metacognitive skills are skills associated with an understanding of how learning occurs, while affective skills are skills that are related to feelings and emotions.

Models of independent learning

Models of independent learning build on the theoretical notion of learning styles (Gardner, 1983; Kolb, 1984; Hall, 2005). Of the many theories of learning styles, some suggest that individuals have different ways of learning, such as through written text or through imagery. This conceptualisation of learning has provided a useful basis for teachers and pupils to talk about learning.

Pintrich (2000) proposed a theoretical model of self-regulated learning that emphasises the importance to the learners of planning, self-monitoring, controlling and evaluating their learning activities.

Zimmerman (2002) extended Pintrich's model by emphasising the importance of motivation within self-regulation. Zimmerman suggested that motivation influences the three phases of self-regulation: forethought, performance and self-reflection.

The Greek writers Marcou and Philippou (2005) suggest the importance of studying volition when considering motivation within models of self-regulated learning. By volition they refer to the knowledge and the skills necessary to establish and support

an intention until goal attainment. Previous research found that pupils' motivational beliefs are related to their use of volitional strategies (Wolters and Rosenthal, 2000, cited in Marcou and Philippou, 2005). Marcou and Philippou argue that volitional strategies are an integral element of self-regulated learning theory, together with cognitive and metacognitive strategies. This suggests that the model proposed by Marcou and Philippou, compared with that offered by Pintrich (1999), includes an additional dimension, namely the volitional strategies described by Wolters and Rosenthal.

Skills required for independent learning

The skills required for independent learning can be split into cognitive skills, metacognitive skills and affective skills.

Cognitive skills include memory, attention and problem-solving (Carr, 1996; Malone and Smith, 1996; Boekaerts, 1997; Anthony, 1994; Zimmerman, *et al*., 1996). Pupils need to have reached a certain level in their cognitive development, such as being able to decode basic information, before they can embark on independent learning. Teachers are able to promote this cognitive development to encourage independent learning.

Metacognitive skills are skills associated with an understanding of how learning occurs, such as pupils being able to state how they learn and pupils being able to identify other people who help them with their learning (Malone and Smith, 1996; Bransford, *et al*., 2000; Bullock and Muschamp, 2006). Metacognitive skills are necessary for pupils to self-assess their learning.

Affective skills are skills that are relate to feelings and emotions, such as developing a value system, then internalising and acting on these values. Motivation is considered the most important affective skill and is directly associated with an increased capacity for independent learning and can also be an outcome of independent learning (Malone and Smith, 1996; Neber and Schommer-Aikins, 2002; Zimmerman, 2002; Bishop, 2006).

An important skill linking motivation to independent learning may be ‘delay of gratification’, which refers to someone’s ability to wait in order to obtain something that they want. Since motivation includes persistence in the face of difficulties and being willing to try again following initial difficulties, ‘delay of gratification’ may be important in order for motivation to be used for independent learning (Mischel *et al*., 1989, cited in Corno, 1992).

An important consideration regarding the skills necessary for independent learning is whether they are domain-specific or can be readily transferred across subjects. While the US-based authors Paris and Paris (2001) suggest that strategy instruction in literacy may allow pupils to transfer these strategies to other subjects, the US-based Neber and Schommer-Aikins (2002) suggest that the determinants of self-regulated learning are influenced by the situation. They suggest that even if general epistemological beliefs exist, these will be adapted to specific domains. This indicates a lack of agreement about whether the cognitive, metacognitive and motivational skills required for independent learning are domain specific. The resolution of this issue could have important consequences for the teaching of independent learning skills since at present it is unclear whether pupils can readily transfer independent learning skills from one subject to another

How teachers can promote independent learning

The UK and international literature indicates that pupils do not become effective independent learners by themselves. Rather, pupils need to learn how to learn, indicating that effective ways to learn can and should be promoted by teachers (Gorman, 1998; Paris and Paris, 2001; Artelt *et al*., 2003; Van Grinsven and Tillema, 2006).

Promoting independent learning requires a new role for teachers, one based not on the traditional transmission of information, but on process-oriented teaching, which ensures that pupils are actively involved in the learning process (Bolhuis and Voeten, 2001).

The literature provides a variety of suggestions relating to how teachers can

promote independent learning by using a range of strategies, including scaffolding; providing pupils with opportunities to self-monitor; offering models of behaviour; developing a language for learning and providing feedback on homework (Gorman, 1998; Black, 2007; Montalvo and Torres, 2004).

There are a host of metaphors used for the role of teachers in facilitating independent learning. The most common metaphors consider teachers as coaches (Allan *et al.*, 1996; Van Grinsven and Tillema, 2006), mentors (Malone and Smith, 1996) and guides (Bishop, 2006). These metaphors focus on teachers understanding how pupils think and learn and guiding them towards independence. The British writers Malone and Smith (1996) emphasise that it is important for teachers to consider individual pupils rather than the class as a whole. The role of teachers as mentors involves teachers relaying their enthusiasm about a topic to pupils, and encouraging pupils to make enquiries for themselves. Therefore, teachers should provide opportunities for pupils to make these enquiries, for example by encouraging pupils to ask challenging questions. This may increase pupils' desire to be coached.

Given the importance of motivation for independent learning, several UK and international authors stress the importance of teachers motivating pupils (Van Grinsven and Tillema, 2006; Malone and Smith, 1996; Corno, 1992; Birenbaum, 2002). According to the British writers Malone and Smith (1996) motivation within the classroom is based on pupils developing interest and involvement. Teachers can foster motivation by ensuring that success is recognised and praised. It is important for teachers to allow all pupils to be successful at times, by making sure that some tasks are easy. Malone and Smith also suggest that teachers should foster motivation by sharing the purpose of lessons with pupils and stating the long-term goals. However, Malone and Smith suggest that while it is important for teachers to share the long-term goals with pupils, it is also important for teachers to recognise if pupils cannot immediately achieve goals. If this is the case, teachers should set immediate targets for pupils so that their interest is sustained.

It may also be possible to increase pupils' motivation by ensuring that tasks provided during independent learning are based on realistic scenarios that pupils can relate to

in their everyday lives. In order to achieve these realistic scenarios the US-based writers Marx *et al.* (1997, cited in Paris and Paris, 2001) propose that classroom activities should be based on projects that are organised around a key question that is meaningful, worthwhile and feasible.

The use of ICT to facilitate independent learning is, for school-age children, an under-researched subject within the UK literature. However, there is some evidence from the General Teaching Council for England (2007) concerning the potential importance of ICT for the promotion of independent learning. The General Teaching Council for England documents a research project that investigated the use of ICT for transforming teaching and learning in schools. An aim of this project was to change the traditional roles of teachers and pupils by enabling pupils to learn more autonomously. Initially the teacher presented pupils with the learning goals, which were generally taken from the National Curriculum. Pupils were then asked how they would like to work towards this goal. This involved the teacher providing pupils with a variety of ICT tools, such as the internet, electronic whiteboards and video equipment. Pupils were directed to plan learning events and select which ICT resources to use. They then organised themselves into groups and worked collaboratively. Importantly, the project involved restructuring classroom activity so that there was a move away from teaching lessons as discrete blocks and towards focusing on project learning across lessons.

While the study offers no quantitative evidence for the impact of using ICT on pupil outcomes, it notes that teachers reported highly positive outcomes. These included pupils being highly motivated and engaged with the learning tasks. Furthermore teachers reported that they had to deal with fewer disciplinary issues and could therefore focus more on the curriculum topic in question.

This project demonstrates the possible importance of ICT for independent learning since it provides the tools for pupils to increasingly take over responsibility for their own learning. This allows for a change in how both pupils and teachers approach learning. Importantly, this project also demonstrates how teachers can act as facilitators within the classroom, by supporting pupils in the use of ICT and therefore in the development of pupils' independent learning.

There is a consensus in the literature concerning the importance of promoting independent learning in the long term (Evans, 1991). This involves teachers building up a repertoire of strategies to promote independent learning and gradually engaging pupils in becoming more independent, by modelling learning behaviour and providing pupils with a supportive scaffold. During this gradual process of becoming more independent, pupils need assistance and feedback, not only on the results of their learning, but also on the process of learning itself (Artelt *et al*., 2003).

Considering the importance of long-term interventions, the Dutch writer Boekaerts (1997) criticises the methods that teachers use to steer and guide the learning process since pupils are neither invited nor encouraged to develop cognitive and motivational self-regulated learning skills. She says that most tasks set to pupils in this type of schooling are 'outcome-based practice sessions' with teachers as the experts and children as the novices. This model assumes that the progress of the learners from novice to expert will be spontaneous. In reality, however, pupils do not become self-regulated learners overnight. For self-regulated learning to develop, teachers must create a powerful learning environment 'in which students are allowed and inspired to design their own learning experiments' (Boekaerts, 1997, p162). Children, according to Boekaerts, should be motivated actively to participate in the teaching–learning processes organised by the teacher and to construct their own knowledge based on their experience.

Boekaerts further argues that learners' early attempts at self-regulation are usually complex and demanding: even when they have access to rudimentary forms of prior knowledge and technique, they lack experience in combining them in a self-regulated fashion. Therefore, initially, their self-regulated learning is characterised by conscious, deliberate processing and they depend on external control by the teacher to regulate their learning. If they are to proceed beyond this point, the teacher has to ensure that cognitive self-regulation is an explicit educational target. The need for long-term intervention for the development of independent learning is therefore essential.

How schools can promote independent learning

The UK and international literature stresses that the promotion of independent learning requires a whole-school approach (Wilson, 2000; Artelt *et al.*, 2003). In order for this whole school approach to be successful it is necessary for teachers to be supported (Black, 2007; Lucas *et al.*, 2002). In addition, schools may be able to promote independent learning by providing study support to their pupils (Sharp *et al.*, 2002). The US-based writers Cleary and Zimmerman (2004) propose a self regulation empowerment programme, which is a comprehensive programme that schools can adopt to develop self-regulated learners in a step-by-step manner.

Several authors note that this whole-school approach is only possible if schools provide adequate support for teachers (Black, 2007; Lucas *et al.*, 2002). The British writer MacBeath (1993) argues that supporting teachers in implementing independent learning is the most crucial factor in determining its success. MacBeath describes how case-study schools in Strathclyde appointed coordinators who were key figures in spreading enthusiasm for supported study, which included independent learning. These coordinators monitored attendance and progress of supported study, kept all stakeholders informed and liaised with other schools. This ensured that teachers were not isolated in promoting independent learning.

The British writers Sharp *et al.* (2002) suggest that an important way in which schools can promote independent learning is by providing study support. Study support is defined as a range of learning activities taking place outside school hours. Sharp *et al.* identified two main reasons why study support contributes to learning: it leads to pupils acquiring knowledge and skills, and also leads to their personal development. This acquisition of knowledge and skills leads not only to staff reporting an improvement in pupil attainment but also to further opportunities for new learning to occur for the pupils. Personal development includes pupils reporting increased self-confidence, motivation, autonomy and self-esteem. These findings indicate that there is a strong connection between independent learning and study support since it enables pupils to voluntarily choose their learning activities and achieve their own learning goals. The provision of study support may therefore provide a way for schools to promote independent learning, and allow pupils to gain the skills needed for independent learning without changing the structure of ordinary

lessons. However, in support of the British writer Wilson (2000), Sharp *et al.* note that study support must be viewed as a whole-school initiative and an integral part of the school's provision for learning. This requires leadership from the head teacher and senior management team.

The US-based writers Cleary and Zimmerman (2004) propose a self-regulation empowerment programme (SREP) that middle schools can use to apply Zimmerman's (2002) self regulation theory. SREP aims to empower pupils by increasing their knowledge of learning strategies and consists of two primary components. First, diagnostic assessment indicates that it is necessary to ask specific, context-based questions that will provide information about pupils' range of learning strategies. Second, the process of developing the self-regulated learner aims to change the identified deficits into strengths. This is achieved in three steps: empowerment, provision of learning strategies and the cyclical feedback loop.

Empowerment refers to making it clear to pupils that academic success is under their control. Provision of learning strategies aims to enhance pupils' range of learning strategies. The cyclical feedback loop involves teaching pupils how to use their newly learnt learning strategies in a cyclical, self-regulated way.

According to Cleary and Zimmerman anecdotal evidence suggests that the model has positive effects on pupil achievement and motivation. However, there are several limitations to the SREP. Importantly, it does not involve a set of specific procedures that can be rigidly applied to all pupils in the same manner. When using the programme pupils' individual characteristics must therefore be taken into account. This may be very difficult to achieve in practice.

The impact of independent learning

Within the literature claims have been made for wide-reaching benefits of independent learning, including improved academic performance (Van Grinsven and Tillema, 2006; Hinds, 2007; Schunk, 2005; Allan, *et al*., 1996); increased motivation

and confidence (Van Grinsven and Tillema, 2006; Black, 2007); the stimulation of lifelong learning (Williams, 2003); allowing pupils to become more aware of and better able to manage their limitations (Zimmerman, 2002); enabling teachers to provide differentiated tasks for pupils (Deeson, 2006); and promoting social inclusion by countering alienation (Weekes and Wright, 1998).

The literature indicates that the use of independent learning may have a specific impact on particular pupil groups. Boys seem to be more inclined towards performance goals and superficial or surface learning strategies (such as rote learning) than girls (Niemivirta, 1997); and gifted pupils seem to be more likely than other pupils to use self regulatory learning strategies (Risemberg and Zimmerman, 1992). Independent learning may highlight the progress of pupils with special educational needs and give them a sense of control over their achievements (Schunk, 1989); or it might be effective in countering the alienation of 'socially excluded' children (Weekes and Wright, 1998).

However, caution is needed in interpreting the evidence base for these claims. Most of the research methods used involve case studies and observation rather than experimental studies and there is therefore a dearth of robust evidence to support the contention that the reported benefits are entirely due to independent learning.

The role of assessment

Although many writers have considered assessment for learning, there is a shortage of literature on the role and impact of assessment on independent learning. This shortage of literature may be based on the difficulty of relating independent learning to assessment. This difficulty was explored by Black *et al.* (2006), who considered how 'learning to learn' is linked to 'assessment for learning'. These writers were unsuccessful in constructing an instrument to assess 'learning to learn' and were not able to describe how 'learning to learn' and 'assessment for learning' are linked. Considering these difficulties, Black *et al.* (2006) suggest that schools should promote practices that have the potential to increase autonomy in learning without necessarily relating this to assessment.

Despite these difficulties, the literature indicates that both formative and summative assessments are important for independent learning. Formative assessment contributes to the process of learning and summative assessment demonstrates the outcomes of independent learning. It seems that the use of both these forms of assessment may promote independent learning.

The US-based writers Paris and Paris (2001) stress the importance of formative assessment because it improves pupils' motivation, behaviour and attitude in the classroom. According to Paris and Paris formative assessment should include self assessment by pupils, involving pupils evaluating their own level of understanding and interest. In support of this notion, Schunk and Ertmer (2000, cited in Paris and Paris, 2001) suggest that teachers should provide for periodic but not too frequent self-assessment components since this adds to learning goals and helps pupils maintain a high level of self-efficacy. Similarly, Paris and Paris suggest that self assessment is linked to pupils' feelings of success and enjoyment.

Considering the UK, Griffith (1998) suggests that devices such as profiling, records of achievement, pupil-negotiated settlements, subject counselling and peer assessment may broaden the assessment process to include the pupil. In Griffith's view, the best assessment systems combine criterion and self-progress references, so that, in his ideal scheme, the collaborative group of learners might decide on what to assess and how to assess it and the teacher might validate the assessment.

Paris and Paris (2001) suggest that summative assessment of self-regulated learning fosters the planning and regulation of self-regulated learning in the future. This is due to summative assessment providing teachers with a valuable understanding of pupils' level of competencies. Teachers are then able to adapt the opportunities for independent learning to match pupils' needs. Furthermore, it is suggested that teachers use summative assessment to provide pupils with feedback. This allows pupils to evaluate what they have learnt. Therefore summative assessment provides an opportunity to improve the provision of self-regulated learning within the classroom for teachers, and for pupils to develop as self-regulated learners.

Allan and Lewis (2001) add to the work by Paris and Paris by stressing that summative assessment provides pupils not only with feedback on *what* they have learnt, but also with an understanding of *how* they learn. Van Grinsven and Tillema (2006) suggest that pupils' understanding of how they have learnt is best achieved by basing summative assessment on how individual pupils have improved rather than comparing pupils. However, since pupils in self-regulated learning environments frequently work in groups, individual contributions to a group product are often obscured. Therefore it may be useful for teachers to structure group tasks so that individual efforts can be identified.

The report of the Teaching and Learning in 2020 Review Group (DfES, 2006), stresses that the combination of formative and summative assessment improves pupils' capacity to learn how to learn. The form of assessment advocated by Gilbert in this review includes pupils monitoring their progress and collaborating with their teachers to identify their next steps. It is suggested that techniques such as open questioning, sharing learning objectives and success criteria, and focused marking should be used. Gilbert states that based on these techniques pupils may take an active role in their learning, indicating the importance of these techniques for the development of independent learning.

The Gilbert Review (DfES, 2006) also proposed that assessment should enable pupils to reflect on their learning by reviewing both *what* they have learnt and *how* they have learnt. According to Gilbert this contributes to pupils' understanding, allowing them to determine their level of achievement and make progress towards their goal. It is suggested that this reflection can involve pupils working individually or in pairs. Importantly, assessment that promotes learning is a joint activity between teacher and pupil, rather than occurring occasionally at the end of a unit of work.

These notions indicate that the role of assessment for independent learning is based on ensuring that pupils understand the standard of performance that is expected of them. Pupils then monitor their own performance against this standard, and know what they can do to improve. Therefore assessment allows for pupils to become owners of their own learning, thus paving the path towards independent learning.

Challenges and suggested solutions

The literature identifies a number of challenges in implementing independent learning and also suggests some solutions.

One of the main challenges is the teachers' perception that the delivery of the National Curriculum requires some whole-class teaching approaches (Bullock and Muschamp, 2006; Myhill and Warren, 2005; Myhill, 2006). The literature suggests that this may restrict the opportunity for independent learning because it is teacher directed rather than fostering pupils' involvement in and responsibility for their own learning (Bronkhorst, 1997; Gorman, 1998).

Another challenge is that teachers' perceptions of how pupils learn may not correspond to the conceptualisation of independent learning. This may pose a barrier to the implementation of independent learning since some teachers do not perceive pupils to be able to learn independently (Wood and Millichamp, 2000; Nunan, 1994). This barrier could be overcome by supporting teachers and ensuring that they understand that independent learning does not undermine their role as teachers (Wood and Millichamp, 2000).

A further challenge is that pupils may resist the introduction of independent learning or may abuse the freedoms associated with its introduction, which makes the implementation of independent learning impossible (Bates, 1998; Kane, 2004). To overcome this barrier it is necessary for independent learning to be appropriately planned and structured. This involves supporting teachers and adopting a whole-school approach (Williamson, 1995).

The use of ICT for independent learning may prove challenging since it requires time and effort to create appropriate resources (Wagener, 2006). It is suggested that this barrier could be overcome by designers ensuring that they consult pupils and engage them in the production of ICT resources. This would ensure that ICT resources are appropriate and may provide opportunities for teachers and pupils to learn collaboratively (Page, 1989b).

Last, but not least, is the fact that the level of parental support that pupils receive for school work is linked to their socio-economic background. Therefore independent learning may benefit pupils from a more advantaged socio-economic background more than pupils from a less advantaged one, thus increasing the socio-economic divide (Bates and Wilson, 2002). This challenge might perhaps be managed by establishing strong links between schools and parents (Black, 2007).

Conclusions and implications for policy and practice

Any reference to or promotion of independent learning will need to be supported by a clear and consistent definition of independent learning. It may also be helpful within the definition to explain the relationship between independent learning and allied terms and concepts.

The successful promotion of independent learning will require careful attention to the learning environment, focusing on both the relationship between teachers and pupils and the wider physical environment and resources within it, including ICT. This has implications for the scope and content of any guidance offered.

Teachers may be helped to promote independent learning in their pupils through an understanding of the models and theories of learning that underpin effective learning. This has implications for initial teacher training and continuing professional development and also for curriculum policy and guidance.

The evidence is inconclusive about the extent to which skills for independent learning are domain-specific or transferable across domains. Further evidence is therefore required to enable appropriate guidance to be developed.

The role of teachers in assisting pupils to learn how to become independent learners is a crucial one as pupils do not become effective independent

learners by themselves. There is a well-documented repertoire of strategies teachers can use. This has significant implications for the training and development of teachers both in understanding their role and in deploying appropriate strategies for independent learning.

As the evidence indicates that promoting independent learning requires a whole-school approach, appropriate guidance and support are needed for head teachers and strategic managers and they need to be based on a strong body of evidence.

The volume of case-study evidence available suggests that there are wide ranging benefits to pupils from independent learning. The lack of strong evidence suggests that the promotion of independent learning warrants further consideration and development before wider implementation.

The relationship between assessment and independent learning suggests that careful consideration needs to be given to the development of formative and self-assessment approaches when they are being used to foster independent learning.

There are a number of implications arising from any potential proposal for a strategic implementation of independent learning which require consideration. These include the need to review guidance on curriculum delivery in the light of a changing role for teachers and subsequent consequences for teacher training and professional development; the need for progressive and systematic preparation for and development of pupils in becoming independent learners within the curriculum; and ensuring parental understanding of and support for independent learning.

New research: shifting power to learners in further education

Alison Wolf's recent report, *How to Shift Power to Learners* (2010) called for a 'demand-led' FE sector in England, with a move away from central procurement to a system where funding follows the learner. Against this background, there is a need

to take the further step of exploring the extent to which further education institutions may be able to shift power to individual learners within the learning environment.

LSN's projected new research will address current practices of independent learning amongst teachers in FE, their theoretical understanding of the concept, how they apply it in practice, the extent to which it is employed and the various models which define its practical application. The project will examine the institutional barriers and enablers of independent learning in FE and work-based learning (WBL) and consider how it might best be promoted.

The intention is to administer a questionnaire to all FE institutions in England and to a sample of WBL providers; and to gain a more in-depth view by conducting case studies in a number of FE and WBL providers.

In a world characterised by the knowledge explosion, globalisation and the crucial need for people to be lifelong learners, the development of the ability to learn independently may be seen as essential to the future of education, economy and society.

References

Alexander, R., Rose., J. and Woodhead, C. (1992). *Curriculum organisation and classroom practice in primary schools*. London: Department for Education and Skills.

Allan, B., Cook, M. and Lewis R. (1996). *The independent learner: developing independence in learning*. Humberside: University of Humberside Press.

Allan, B. and Lewis, R. (2001). Learning independently. *Managing Schools Today,* 10(7), 24-6.

Anthony, G. (1994). Learning strategies in the mathematics classroom: what can we learn from stimulated recall interviews? *New Zealand Journal of Educational Studies*, 29 (2), 127-40.

Anthony, G. (1996). Active learning in a constructivist framework. *Educational Studies in Mathematics*, 31, 349-69.

Artelt, C., Baumert, J., Julius-McElvany, N. and Peschar, J. (2003). *Learners for life:*

student approaches to learning: results from PISA 2000. Paris: Organisation for Economic Cooperation and Development.
Bandura, A. (2001). Social cognitive theory: an agentic perspective. *Annual Review of Psychology,* 52 (1), 1-26.
Bates, I. (1998). Resisting 'empowerment' and realizing power: an exploration of aspects of the GNVQ. *Journal of Education and Work*, 11(2), 187-203.
Bates, I. and Wilson, P. (2002). Family and education: supporting independent learning. *Learning and Skills Research*, 6(1), 3.
Bates, I. and Wilson, P. (2003). *Youth, family and education: the formation of the independent learner*. Brighton: Trust for the Study of Adolescence in association with the ESRC.
Bereiter, C. (2002). *Education and Mind in the Knowledge Age*. Mahwah, N J: Erlbaum.
Birenbaum, M. (2002). Assessing self-directed active learning in primary schools. *Assessment in Education,* 9(1), 119-38.
Bishop, G. (2006). True independent learning - an andragogical approach: giving control to the learner over choice of material and design of the study session. *Language Learning Journal,* 33, 40-6.
Black P., McCormick R., Mary, J. and Pedder, D. (2006). Learning how to learn and assessment for learning: a theoretical inquiry. *Research Papers in Education*, 21(2), 119-32.
Black, R. (2007). *Crossing the bridge - overcoming entrenched disadvantage through student-centred learning.* Melbourne: Education Foundation.
Boekaerts, M. (1997). Self-regulated learning: a new concept embraced by researchers, policy makers, educators, teachers and students. *Learning and Instruction*, 7(2), 161-86.
Boekaerts, M. (1999). Self-regulated learning: where we are today. *International Journal of Education Research*, 31(6), 445-457.
Bolhuis, S. and Voeten, M.J.M. (2001). Toward self-directed learning in secondary schools: what do teachers do? *Teaching and Teacher Education,* 17(7), 837-55.
Bransford, J.D., Brown, A.L. and Cocking, R.R. (2000). *How people learn: brain, mind, experience, and school*. Washington: National Academy Press.
Bronkhorst, J (1997). Independent learning by using ICT and multimedia: some recent developments in the Netherlands. *Media International*, 34 (3), 140-3.

Buerk, D. (ed) (1994). *Empowering students by promoting active learning in Mathematics*. Reston, Virginia: National Council of Teachers of Mathematics.
Bullock, K. and Muschamp, Y. (2006). Learning about learning in the primary school. *Cambridge Journal of Education,* 36(1), 49-62.
Candy, P. (1991). *Self-direction for lifelong learning: a comprehensive guide to theory and practice.* San Francisco: Jossey-Bass.
Carr, M. (1996). *Teaching children to self-regulate: a resource for teachers.* Athens: National Reading Research Centre.
Chia, C. (2005). Promoting independent learning through language learning and the use of IT. *Educational Media International*, 42 (4), 317-32.
Cleary, T.J. and Zimmerman, B.J. (2004). Self-regulation empowerment program: a school-based program to enhance self-regulated and self-motivated cycles of student learning. *Psychology in the Schools,* 41(5), 537-50.
Coffield, F., Moseley, F.D., Hall, E. and Ecclestone, K. (2004). *Learning styles and pedagogy: a systematic and critical review*. London: Learning and Skills Research Centre.
Corno, L. (1992). Encouraging students to take responsibility for learning and performance. *The Elementary School Journal*, 93(1), 69–83.
Davies, P., Hymer, B. and Lawson, H. (2005). Developing 'learning to learn' skills through experiential challenges. *Gifted education international* 20(1), 80-87.
Deeson, E. (2006). Creating a learning to learn school. *British Journal of Educational Psychology*, 37 (4), 651.
DfES (2004a). *A national conversation about personalised learning.* Nottingham: Department for Education and Skills.
DfES (2004b). *Teaching and learning in the foundation subjects.* Nottingham: Department for Education and Skills.
DfES (2004c). *Excellence and enjoyment: learning and teaching in the primary years (including National Strategy Aims).* Nottingham: Department for Education and Skills.
DfES (2005a). *Higher standards, better schools for all.* Nottingham: Department for Education and Skills.
DfES (2005b). *14-19 Education and Skills.* Nottingham: Department for Education and Skills.
DfES (2005c). Leading and learning at key stage 3. Nottingham: Department for Education and Skills.

DfES (2005d). Harnessing technology. Notingham: Department for Education and Skills.
DfES (2006). *2020 vision: report of the teaching and learning in 2020 Review Group*. Nottingham: Department for Education and Skills.
EPPI-Centre (2004). *Thinking skills approaches to effective teaching and learning: what is the evidence for impact on learners?* London: EPPI-Centre, Institute of Education, University of London.
EPPI-Centre (2005). *A meta-analysis of the impact of the implementation of thinking skills approaches on pupils*. London: EPPI-Centre, Institute of Education, University of London.
Ertmer, P.A. and Newby, T.J. (1996). The expert learner: strategic, self-regulated and reflective. *Instructional Science*, 24(1), 1-24.
Evans, G. (1991). *Learning and teaching cognitive skills*. Hawthorn, Victoria: Australian Council for Educational Research.
Gardner, H. (1983). *Frames of mind: the theory of multiple intelligences*. London: Heinemann.
Gorman, M. (1998). The 'structured enquiry' is not a contradiction in terms: focused teaching for independent learning. *Teaching History*, 92, 20-5.
Griffith, R. (1998). *Independent citizenship and independent learning*. London: Jessica Kingsley Publishers.
Hall, E. (2005). Learning styles - is there an evidence base for this popular idea? *Education review,* 19 (1), 49-56.
Higgins, S., Wall, K., Falzon, C., Hall, E. and Leat, D. (2005). *Learning to learn in schools – Phase 3 Evaluation Year 1 Final report.* Newcastle: University of Newcastle upon Tyne.
Higgins, S., Baumfield, V. and Hall, E. (2007). *Learning skills and the development of learning capabilities*. London: EPPI-Centre, Institute of Education, University of London.
Hinds, D. (2007). It's all about me. *TES Magazine*, 5/10/07, 14-19.
Huddleston, P. and Unwin, L (2002). *Teaching and learning in further education: diversity and change.* London: Routledge.
James, M., Black, P., McCormick, R., Pedder, D. and William, D. (2006). Learning how to learn in classrooms, schools and networks: aims, design and analysis. *Research Papers in Education*, 21(2), 101-18.

Kane. L. (2004). Educators, learners and active learning methodologies. *International Journal of Lifelong Education*, 23(3), 275-286.
Kesten, C. (1987). *Independent learning*. Saskatchewan: Saskatchewan Education.
Kimonen, E. and Nevalainen, R. (2005). Active learning in the process of educational change. *Teaching and Teacher Education,* 21(6), 623-35.
Kinchin, I. (2004). Investigating students' beliefs about their preferred role as learners, *Educational Research,* 46(3), 301-12.
Kolb, D.A. (1984). *Experiential learning: experience as the source of learning and development.* Englewood Cliffs: Prentice-Hall.
Korotov, V.M. (1992). Students' self-directed activity in class. *Russian Education and Society*, 34(2), 22-33.
Krathwohl, D.R., Bloom, B.S. and Masia, B.B. (1964).*Taxonomy of educational objectives, Book II. Affective domain.* New York: David McKay.
Lamb, A. and Callison, D. (2005). Online learning and virtual schools. *School Library Media Activities Monthly,* 21(9), 29-35.
Lim, C.P. and Chai, C.S. (2004). An activity-theoretical approach to research of ICT integration in Singapore schools: orienting activities and learner autonomy. *Computers and Education,* 43, 215-36.
Lucas, B., Greany, T., Rodd, G. and Wicks, R. (2002). *Teaching pupils how to learn.* Stafford: Network Educational Press.
MacBeath, J. (1993). *Learning for your self: supported study in Strathclyde schools*. Strathclyde: Strathclyde Regional Council.
Malone, G. and Smith, D. (1996). *Learning to learn: developing study skills with pupils who have special educational needs.* London: National Association of Special Education Needs.
Marcou, A. and Philippou, G. (2005). Motivational beliefs, self-regulated learning and mathematical problem solving. In H.L. Chick and J.L. Vincent (eds.), *Proceedings of the 29th conference of the International Group for the Psychology of Mathematics Education*, 3, 297-304.
Mok, M.M.C. and Chen, Y.C. (2001). A theory of self-learning in a networked human and IT environment: implications for education reforms. *The International Journal of Educational Management,* 15(4), 172-86.
Montalvo, F.T. and Torres, M.C. (2004). Self-regulated learning - current and future directions. *Electronic Journal of Research in Educational Psychology,* 2, 1-34.

Myhill, D. (2006). Talk, talk, talk: teaching and learning in whole class discourse. *Research Papers in Education* 21(1), 19-41.
Myhill, D. and Warren, P. (2005). Scaffolds or straitjackets? Critical moments in classroom discourse. *Educational Review* 57(1), 55-69.
Neber, H. and Schommer-Aikins, M. (2002). Self-regulated science learning with highly gifted students: the role of cognitive, motivational, epistemological, and environmental variables. *High Ability Studies,* 13(1), 59-74.
Niemivirta, M. (1997). *Gender differences in motivational-cognitive patterns of selfregulated learning.* Annual Meeting of the American Educational Research Association paper, March 1997.
Noyes, A. (2005). Pupil voices: purpose, power and the possibilities for democratic schooling. *British Educational Research Journal,* 31(4), 533-40.
Nunan, D. (1994). *Towards autonomous learning: some theoretical, empirical and practical issues*. Hong Kong: Hong Kong University Press paper.
Ommundsen, Y. (2003). Implicit theories of ability and self-regulation strategies in physical education classes. *International Journal of Experimental Educational Psychology*, 23(2), 141-57.
Page, M. (1989a). *Active learning in secondary social studies*. University of Massachusetts paper, December 1989.
Page, M. (1989b). *Active learning in secondary schools: educational media and technology*. University of Massachusetts paper, November 1989.
Paris, A. and Paris, S. (2001). Classroom applications of research on self-regulated learning. *Educational Psychologist,* 36(2), 89-101.
Pawson, R. (2002). Evidence-based policy: the promise of 'realist synthesis. *Evaluation*, 8(3), 340-58.
Pawson, R., Greenhalgh, T., Harvey, G. and Walshe, K. (2004). *Realist synthesis: an introduction*. ESRC Research Methods Programme paper, University of Manchester.
Peet, N. (2000). Information Technology and Independent Learning. *Learning Resources Journal* 16(1), 12-16.
Perry, N.E., Phillips, L. and Hutchinson, L. (2006). Mentoring student teachers to support self-regulated learning. *Elementary School Journal*, 106(3), 237-254.
Piaget, J. (2001). *Studies in reflecting abstraction*. Hove: Psychology Press.
Pintrich, P.R. (2000). The role of goal orientation in self-regulated learning. In M.

Boekaerts, P.R. Pintrich and M. Zeidner (eds.), *Handbook of self-regulation* (pp451-502). San Diego: Academic Press.
Reynolds, J., Carey, L. and Mason, R. (2002). *How do people learn?* London: CIPD.
Risemberg, R. and Zimmerman, B.J. (1992). Self-regulated learning in gifted students. *Roeper Review*, 15(2), 98-101.
Scantlebury, E. (2006). Knowing what you don't know. *T-magazine*, 28-30.
Schunk, D.H. (1989). *Attributions and perceptions of efficacy during self-regulated learning by remedial readers*. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, March 1989.
Schunk, D.H. (2005). Self-regulated learning: the educational legacy of Paul R. Pintrich. *Educational Psychologist*, 40(2), 85-94.
Schunk, D.H. and Zimmerman, B.J. (1994). *Self-regulation of learning and performance: issues and educational applications*. Hillsdale, N J: Erlbaum.
Seary, C.J. (2004). Pathways to independent learning. *Computer Education,* 86, 8-12.
Sharp, C., Pocklington, K. and Weindling, D. (2002). Study support and the development of the self-regulated learner. *Educational Research*, 44(1), 29-41.
Silberman, M. (1996). *Active learning*. Needham Heights, Massachusetts: Allyn and Bacon.
Stefansson, G. (2004). The tutor-web: an educational system for classroom presentation, evaluation and self-study. *Computers and Education,* 43, 315-43.
Taggart, G., Ridley, K., Rudd, P. and Benefield, P. (2005). *Thinking skills in the early years: a literature review*. Slough, Berkshire: NFER. Teaching and Learning Research Programme (2008). At www.tlrp.org/, accessed 25 February 2008.
Van Grinsven, L. and Tillema, H. (2006). Learning opportunities to support student selfregulation: comparing different instructional formats. *Educational Research* 48(1), 77-91.
Wagener, D. (2006). Promoting independent learning skills using video on digital language laboratories. *Computer Assisted Language Learning*, 19 (4) & (5), 279-86.
Wallace, B. (2002). *Teaching thinking skills across the middle years*. London: David Fulton.
Weekes, D. and Wright, C. (1998). *Improving practice: a whole-school approach to raising the achievement of African Caribbean youth*. London: Runnymede Trust.

Weiss, M. (2004). *Developmental sport and exercise psychology: a lifespan perspective.* Morgantown, West Virginia: Fitness Information Technology Inc.
White, J. (1998). *Do Howard Gardner's multiple intelligences add up?* London: Institute of Education, University of London.
Whitehead, J. and Clough, N. (2004). Pupils, the forgotten partners in education action zones. *Journal of Education Policy,* 19(2), 215-27.
Williams, J. (2003). *Promoting independent learning in the primary classroom*. Buckingham: OUP.
Williamson, K. (1995). Independent learning and the use of resources: VCE Australian Studies. *Australian Journal of Education*, 39(1), 77-94.
Wilson, V. (2000). Can thinking skills be taught? *Scottish Council for Educational Research Spotlights*, 79, 1-4.
Winne, P. H. and Jamieson-Noel, D. (2002). Exploring students' calibration of self reports about study tactics and achievement. *Contemporary Educational Psychology,* 27 (4), 551-72.
Wolf, A. (2010). *How to Shift Power to Learners.* London: LSN.
Wood, E.K. and Millichamp, P. (2000). Changing the learning ethos in school. *Journal of Inservice Education*, 26(3), 499-515.
Zimmerman, B.J. (1986). Becoming a self-regulated learner: which are the key subprocesses? *Contemporary Educational Psychology*, 11(4), 307-13.
Zimmerman, B. J., Bonner, S. and Kovach, R. (1996). *Developing self-regulated learners: beyond achievement to self-efficacy.* Washington, D C: American Psychological Association.
Zimmerman, B. J. (1998). Developing self-fulfilling cycles of academic regulation: an analysis of exemplary instructional models. In Schunk, D. H. and Zimmerman, B. J. (eds.), *Self-regulated learning: from teaching to self-reflective practice.* New York: Guilford Press.
Zimmerman, B.J. (2002). Becoming a self-regulated learner: an overview. *Theory into Practice*, 41(2), 64-72.

This document was added to Education-line on 6 September 2010