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Abstract

Active learning is a pedagogical construct widely appealed to within the global discourse of lifelong learning. However, an examination of the literature reveals a lack of clarity and consensus as to its meaning. This paper provides a critical analysis of a range of dimensions underpinning the concept of active learning including policy discourses, definitions, interpretation and enactments in educational settings, and resultant pedagogical implications. A more robust theoretical framework is presented to support educator understanding which synthesises and extends current constructs and which bridges the divide between active learning considered as either theory of learning or pedagogical strategy.

Key words: active learning; constructivism; curriculum; lifelong learning; pedagogy.

Introduction

Educators from early years to higher education are increasingly charged with engaging young people in active learning. This discourse emanates from the lifelong learning agenda which has emerged as a concern globally within education policy and is a focus for research in a number of educational contexts. This paper provides a critical analysis of a range of dimensions of the concept of active learning: the underlying policy rationale, definitions, interpretation and enactment in educational settings, and resultant pedagogical implications. We seek to establish whether there are any common traits that would enable us to develop a more robust, or at least a more transparent, working definition to support educator understanding. We identify some of the contemporary themes which appear to underpin the rationale for the active learning discourse and we trace the development of some of these through the European educational policy agenda which provides a catalyst for the current interest in this discourse in the European context. We then explore how these themes are developed to promote active learning in educational policies taking as our example the implementation of Curriculum *for Excellence* in Scotland (Scottish Executive [SE] 2004). One of the most significant underlying reasons offered for the current interest in active learning is as a response to changing economic demands and patterns of work which underpin the ubiquitous discourse of the 'learning society' (part of the trend identified by Biesta [2009, 38] of the 'learnification' of education - 'the translation of everything there is to say about education in terms of learning and learners'). Indeed, Niemi 2002, p. 763) says that 'Learning has been acknowledged lately in Europe as the very core of economic development', while the European Commission takes the view that 'Lifelong learning should be the norm' (Commission of the European Communities 2008, 3). Conceptualised in this manner, lifelong learning demands that the individual engages in a continual process of 'retooling' their knowledge and skill base as these become 'rapidly obsolete' (Grabinger, Dunlap &

Duffield 1997, 5-6). This requires the 'learner' to undertake the types of activities that will enable them to 'solve technical, social, economic, political, and scientific problems' and so play an 'effective role' in today's competition-oriented society (Grabinger et al. 1997, 6). The knowledge and skills required to negotiate and manoeuvre within this progressively unpredictable world demand that individuals are able to undertake *independent learning* (Halsall & Cockett 1998, 300). Thus, lifelong learning is closely aligned to discourses of 'personalisation', 'individualisation', and 'responsibilisation' (Ball 2008,204) in which individuals are encouraged to take more responsibility for learning - and consequently for any associated failure to do so.

Active learning, as it is presented in the educational policy documents discussed below, is promoted as a means to develop the kinds of skills and dispositions deemed necessary for a lifetime of learning. But Tynjala (1999, 358) acknowledges the implications of the 'considerable challenges posed to educational systems, which are expected to produce experts for working life of the future' and believes this is further complicated, for example, by the need to develop individuals who are expected to be both self-motivated to work/learn independently *and* collaboratively as part of a team. A tension emerges in the contrast between the traditional focus on individual working and summative assessment within schools, and the generally more collaborative nature of the workplace (Tynjala 1999). It can be argued, therefore, that the drivers for the adoption of active learning have been largely economic, and there thus appears to be more concern with active learning in developing the skills of learning (process oriented) rather than with active learning as a set of pedagogic strategies to enhance learning outcomes (product oriented), which has implications for education. This dichotomy centres, in part, on the question of whether active learning is considered as a theory of learning (learning about learning) or as a set of pedagogical strategies (to bring about learning), which is explored in this paper.

Tracing the active learning discourse through policy

In order to achieve the vision of a learning society populated with infinitely flexible and self-programmable lifelong learners the European Commission has outlined a strategy designed to challenge school education in member countries to improve young people's range of competences for the twenty-first century (see, for example, European Commission 2009).These include communication, literacy, numeracy and digital competences, 'transversal competences' for example in new skills required to remain competitive in the global marketplace, and an ability to learn how to learn in order to support the development of self-regulating persons who are both autonomous and collaborative. These competences will be promoted through new pedagogies and a flexible curriculum designed to support a holistic development of health and well-being, active participation in society and the entrepreneurial skills of creativity and innovation. This agenda is intended to underpin member states' national education policies and provides the rationale for the interest in active learning.

In the UK, for example, Northern Ireland education policy puts 'active learning and teaching methods' at the centre of the curriculum, explicitly linking this to the development of skills for lifelong learning (Department of Education 2007). Similarly, the Welsh early years policy argues that 'It is crucial that children have *active experiences* indoors and outdoors that build up the skills, knowledge and understanding that will support their future learning' (Department for Children, Education, Lifelong Learning and Skills 2008, 52, emphasis added). Elsewhere in the European Union the Finnish education system, reportedly one of the most successful in the EU (Ministry of Education and Culture no date), advocates 'a student-oriented, active conception of learning' where 'the organisation of schoolwork and education is based on a conception of learning that focuses on students' activity and interaction with the

teacher, other students and the learning environment'. Here again there is a clear identification of the discourse with the process rather than product of learning.

In Scotland the 'active learning' discourse is clearly evident in the policy document *Curriculum for Excellence* (CfE) (SE 2004) which fosters an implicit expectation that learners will engage in lifelong learning as a result of development of their capacities as: *successful learners, confident individuals, responsible citizens* and *effective contributors*. These four capacities promote an embedded understanding of the individual as an active lifelong learner and a commitment to 'more emphasis on active learning through primary one[1] and beyond' suggests this will be developed from the outset of the individual's engagement in formal education (SE 2006a). In a plethora of documents guiding the roll out of CfE, however, the only one in which the term 'active learning' is explicitly *defined* is *Curriculum for Excellence: Building the Curriculum 2 Active Learning in the Early Years* (SE 2007) in which the active learning discourse permeates the text and is both defined and justified in terms of engagement and challenge:

> In Scotland, as in many countries throughout the world, active learning is seen as an appropriate way for children to develop vital skills and knowledge and a positive attitude to learning. Active learning is learning that engages and challenges children's thinking using real-life and imaginary situations (SE 2007, 5).

In this document, the definition is strongly linked to conceptions of learning through play, (ironic perhaps given that what is being embedded is arguably a means for developing skills for work). But throughout the documents guiding implementation of CfE at all stages of school education is the explicit acknowledgement that active learning approaches will 'encourage participation', 'build upon children's enthusiasm, inventiveness and creativity', as well as 'promote the development of logical and creative thinking and encourage a problem-solving approach' (Scottish Government 2008, 30).

Notably, however, active learning is neither discussed nor further defined and there is an implicit assumption that educators understand the term and concept. This assumption is underlined with the identification, by the school inspectorate, of active learning as one of the key elements singled out for improvement in learning and teaching to enable schools to move from 'good to excellent' (Her Majesty's Inspectorate of Education [HMIE] 2007a, updated online 2010). Again this documentation does not provide any further explicit definition but rather links active learning to a number of elements, for example, through providing a range of experiences that promote active learning by making learners think. It stresses the need for a varied and considered range of skilful and well-paced teaching approaches where teachers and learners interact (HMIE 2007a / 2010). Furthermore, active learning is a key element of the associated documentation (HMIE 2007b) which outlines the self-evaluation process for schools correlated to school inspection; consequently there is an expectation that active learning will be embedded in the pedagogical practices of educators in Scottish schools. Beyond school, the discourse of active learning crosses the boundaries from compulsory to post-compulsory education (Harris 2010). For example it is now one of the underlying principles of the *Enhancement Themes* administered by the Scottish Higher Education Enhancement Committee 'to encourage academic and support staff, and students collectively to share current good practice and to generate ideas and models for innovation in learning and teaching' (The Quality Assurance Agency for Higher Education [QAA] 2010). However, it appears that whilst this concept is promoted across the borders and boundaries of educational settings what it actually is remains far from clear with a range of often weak definitions and the existence of an unspoken tacit understanding of implications for enactment in pedagogy and practice.

Definitions and theoretical underpinning of active learning

The vagueness surrounding the concept of active learning creates opportunities for policy makers (and academics) to shape working definitions to suit their own intentions. This has rendered the concept hazy and empty of meaning. Indeed, the reference to active learning is immediately problematic in that it appears to be placed in opposition to *passive* learning, a notion which seems intrinsically improbable if learning is defined as a change in behaviour, knowledge, understanding, skills attitudes and/or values (Coffield 2008). Watkins, Carnell and Lodge (2007) take this point up arguing that while all learning is active some types of learning are more active than others, namely learning that requires construction of knowledge and understanding as opposed to learning that is more passively received. However, this does not entirely solve the problem, since constructivism, the current orthodoxy in the theory of knowledge, posits that *all* knowledge is constructed. Moreover, modes of learning currently regarded as 'passive' (if not downright oppressive), for example rote learning of poetry, may instead be reconceptualised as supporting the development of creativity through enabling the learner to 'suffer awakening to the poem's otherness' (Munday 2009, 85).

Moreover, given the variety of perspectives evident in the literature a definitive meaning is problematic. A common (mis)conception is that of active learning as a process in which children are engaged in some form of *practical activity* (Maynard, 2002 in Pollard 2002; Priestley 2010; Watkins, Carnell and Lodge 2007). It is this narrow understanding of active learning, alongside the lack of shared understanding of the term that forms the basis of our interest in establishing a more robust framework on which to base a pedagogical awareness of the concept. A more comprehensive framework which enables the analysis of definitions evident in a range of literature has been formulated by Watkins, Carnell and Lodge (2007, 71) who regard active learning as encompassing three distinct dimensions:

- Behavioural: the active employment and development of resources;

- Cognitive: active thought about experiences to make sense and so foster construction of knowledge;
- Social: active interaction with others on both a collaborative and resource driven basis.

Watkins, Carnell and Lodge (2007, 71) suggest that engaging pupils behaviourally involves them 'actively using and creating materials'. But beyond this, active learning requires learners to make decisions and think 'in an active manner', thereby encompassing a cognitive element. Further, in order to make meaning from experiences reflection is seen as central to this notion: 'it is not sufficient simply to have an experience in order to learn. Without reflecting upon this experience it may quickly be forgotten or its learning potential lost' (Gibbs 1988 quoted in Watkins, Carnell and Lodge 2007, 71). Finally, the authors cite Cooper and McIntyre (1993 in Watkins, Carnell and Lodge 2007) who emphasise the importance of social interaction in learning through, for example, talk, drama and group work.

An examination of the literature indicates the extent to which the three dimensions set out by Watkins et al are evident, collectively and individually, in the work of other authors, and also enables an analysis of the robustness of the framework itself. Clearly, the concept of 'activity' in learning is not new, forming a central element of John Dewey's pedagogy, and underpinning Rousseau's exploration of education in *Emile* first published in 1762 (Rousseau 1993). As Russell (1926 quoted in Watkins, Carnell and Lodge 2007, 70) says,

> Wherever it is possible, let the student be active rather than passive. This is one of the secrets of making education a happiness rather than a torment.

This links to the *behavioural* dimension of Watkins, Carnell and Lodge's typology, in which the purpose of active learning is to motivate pupils. This places the responsibility on the teacher to ensure there are opportunities for student participation, creating an incentive for engagement. Stephen, Cope, Oberski and Shand (2008, 17) suggest that young people's engagement in learning 'stems from active involvement, enhanced by a perception that there

is some scope for freedom of action and opportunity for choice' and it would appear from their research that some pupils link engagement to being physically active:

> The secondary school children's enthusiasm for subjects such as PE, Home Economics and Technical Studies suggests that for them engagement in learning stems from active, physical involvement, possibly accompanied by a perceived degree of freedom or 'space' or a sense of achievement of an end product or evident progress. The primary school children are engaged by classroom activities they perceive as play (Stephen at al. 2008, 25).

In this study teachers' perceptions were that the physical activity provided an incentive to engage students in the subject and not the educational/pedagogical rationale or purpose of the task itself. This contrasts with an understanding of active learning as the cognitive processes which underpin 'learning through doing'. For example, the development of analytical and critical thinking skills through authentic problem solving activities which Machemer and Crawford (2007, 11) suggest will 'expose students to thinking/working styles of different disciplines while preparing them for the interdisciplinary teams of real world situations'. Finally, a number of active learning strategies emphasise the importance of the social context of learning including activities such as: discussion, team work, peer learning, collaborative and co-operative learning. Gavalcova (2008) cites the importance of effective questioning to encourage interaction between students to supports the development of metacognitive skills and Machemer and Crawford (2007) suggest engaging in collaborative activity increases participation in class activities and ensures students interact with each other and are consequently less able to hide in this space. Kimonen and Nevalainen (2005) imply effective co-operative working is an important element of educational change in preparing young people for future demands whilst Scardamalia and Bereiter (2006) make similar claims for the importance of collaborative knowledge building.

The three dimensions outlined by Watkins, Carnell and Lodge (2007) - behavioural, cognitive and social - are more frequently found in the literature in various combinations rather than alone. Kane (2004, 277), for example, alludes to both behavioural and cognitive elements in

his description of active learning as fostering autonomous learners able to think critically and take responsibility for their own learning, and of teachers providing more 'open-ended activities' to promote a less passive view of education. Skinner (2010, 153) maintains that there are three dimensions of active learning, namely, to engage actively in learning (but not necessarily on a physical level), experiential learning and cognitive engagement exhibited through choice and direction of learning. Similarly, Birenbaum (2002, 119) suggests that a 'commonly agreed' definition is the degree to which students are 'metacognitively, motivationally and behaviourally active in their learning'. Zweck (2006 in Gavalcova 2008, 118) and Snyder (2003, 161) concur taking the view that active learning is both 'doing' and 'thinking about' tasks.

Anthony (1996, 350) proposes a definition that is more narrowly focused on the cognitive dimension. She identifies learner independence, responsibility for determining the path of learning activities, metacognition and 'active intellectual inquiry' as key elements. However, the social aspect of active learning is alluded to in her exemplification of possible contexts such as group work and collaborative activities. Halsall and Cockett (1998, 304) also define active learning in terms of interaction, but also make emphasise the development of autonomy in learning as 'the ways in which, and the level at which, students rather than teachers are involved in decision-making processes'.

Machemer and Crawford (2007, 10) take a broad view, proposing that active learning is 'anything that is more than passive listening', and they too emphasise the social dimension so that while active learning is 'doing', co-operative learning is 'doing with others.'

Bonwell and Eison (1991, 2) proffer a view of active learning that implicitly acknowledges the behavioural, cognitive and social dimensions, characterising active learning as 'instructional activities that involve students doing things and thinking about what they are doing'. In contrast to Machemer and Crawford (2007) however, they assert that active

learning is more than just listening and emphasise the development of higher order thinking skills such as analysis and evaluation. Strategies such as cooperative learning are also discussed, evidencing implicit awareness of the social dimension, although the assertion that active learning can be carried out on an individual basis is also made. Other similar views are both implicit and explicit in the work of Prince (2004) in relation to higher education, and Hohmann and Weikart (1995, 17) who say, 'Active learning is defined as learning in which the child, by acting on objects and *interacting with people*, ideas, and events, constructs new understanding'. Michael (2006, 160) emphasises student engagement in mental, physical and *participatory learning* with reflection as a key aspect of the process.

The trawl of the literature above suggests a rather fragmented picture in which active learning is often defined as learning which is active or involves activity, or conversely learning which is not passive. In order to advance a more cohesive and robust understanding of active learning it is important to consider possible underpinning epistemological conceptions as these influence the nature, purpose and goals of education. The framework definition adopted by Watkins, Carnell and Lodge (2007) is underpinned by a constructivist epistemology. While there are various conceptions of constructivism (Larochelle, Bednarz & Garrison 1998), within education, and specifically relevant to the definition used here, two branches are most relevant, namely cognitive constructivism, where the focus is on individual construction of knowledge, and social constructivism, in which knowledge is constructed through interaction with others (Phillips 2000). By bringing together these different versions a learning theory emerges in which co/learners are active constructors of knowledge and understanding and meaning making is central to learning (Simons 1997 cited in Watkins, Carnell and Lodge 2007). These aspects of learning are clearly evident in the active learning literature cited above and are explicitly expounded in places, for example: '… mathematics education reforms supporting a constructivist perspective suggest that the

automation of skills and passive intellectual involvement should be replaced by active learning processes' (Hiebert 1992 cited in Anthony 1996, 350); and 'active learning strategies emphasise constructivistic qualities in knowledge processing…' (Niemi 2002, 764). Dennick (cited in Matheson 2008, 50-52) states that '…constructivist theory implies that effective learning should be learning by doing, applying knowledge and problem solving' and proceeds to identify a number of relevant active learning strategies such as social interaction and the importance of fostering cognitive dissonance.

While constructivism constitutes a theoretical foundation for active learning it leaves open the question of whether active learning can be considered a theory of learning in its own right, or whether it should be regarded as a pedagogical approach (or range of approaches). Kane (2004, 276) argues that it is a theory as '…it has evolved generalised principles about the nature of teaching and learning' but also a pedagogical approach as it encompasses a variety of strategies that can be used by educators to bring about learning. He suggests this demonstrates the complexity inherent in attempts to define active learning. Our reading of the literature indicates that active learning appears to cover any and all activities likely to be experienced in formal education, for example: reading, writing, listening, discussing, problem solving, through individual, peer, collaborative and co-operative activities, and includes using resources in and outside the classroom. Active learning may therefore most usefully be considered not as an 'either/or' but a 'both/and' i.e. a disposition on the part of the learner to adopt what Salomon and Globerson (1987, 623) refer to as a 'mindful' approach to the task ('the volitional, metacognitively-guided employment of non-automatic, usually effort-demanding processes') and as the range of pedagogical strategies/practices aimed at *fostering* this mindfulness. Bringing together these two aspects, in which active learning is both disposition to learn and means for bringing this about produces, in addition to the three dimensions proposed by Watkins, Carnell and Lodge (2007), a fourth dimension of *affect*.

The enactment of active learning in educational settings

What are the implications of this construction of active learning for the role of the teacher? The shifting perceptions of the teacher's role is a particular focus of the active learning discourse. A number of authors from early years to higher education describe the teacher as facilitator, supporter or guide (De Kock 2005; Grabinger et al. 1997; Hohmann and Weikart 1995; Niemi 2002; Wang 2009). This shift potentially conflicts with a dimension of the teacher's professional identity as being responsible for the transmission of knowledge, a metaphor which is still pervasive in educational discourses despite current commitments to constructivism (Alexander 2009; Beijaard, Verloop and Vermunt 2000). Moreover, active learning is potentially problematic for teachers since it appears to position them in a more sidelined teaching role than they are accustomed to: though they are central to negotiating and enacting active learning spaces they no longer hold centre stage. Others, however, present a more positive and proactive vision of teachers actively seeking alternative roles and responsibilities in relation to educating pupils (Finlay and Falconer 2005; Kimonen and Nevalainen 2005). This shift in roles is recognised as increasing the challenge for teachers as they are expected to demonstrate expertise in their role as 'motivator, diagnostician, guide, innovator, experimenter, researcher, modeller, mentor, and collaborator' (Crawford 2000 cited in Zion and Slezak 2005, 877).

Active learning approaches also concern classroom culture. Wang (2009) argues that in traditional classroom cultures pupils are positioned as 'listeners' which ultimately restricts their skills in metacognition, and he introduces the notion of an 'active learning environment' which underpins many of the curriculum reforms discussed earlier. However, Kimonen and Nevalainen (2005, 630) argue that curriculum reform in itself is not always sufficient to alter and modify teachers' practices, and it often necessitates 'changes in the beliefs, habits, roles, and power structures of the teachers' as well as developments in pedagogy.

Implications of an active learning approach are also significant for pupils. It is in the discussion of shifting of responsibility for learning from teacher to pupil that the active learning literature is perhaps most in agreement. Several authors position the learner as central to active learning thereby establishing the learner as participant with a key role to play, for example, taking charge or control, being involved, becoming more autonomous (Bonwell and Eison 1991; Gavalcova 2008; Halsall and Cockett 1998; Michael 2006; Kirkwood 2005). This notion of the active learner as pro-active, self- motivated, self-regulated, independent, responsible and reflective is a recurring theme (Halsall and Cockett 1998; Kelly 2004; Niemi 2002; Zion and Slezak 2005). Grabinger, Dunlap and Duffield (1997, 6) advocate a form of pedagogy which places the pupil in control 'in the driver's seat of the learning process' which Keyser (2000, 35) suggests entails a renewed focus on students' 'attitudes and values'. However, in order to do this the teacher is still in control: the student may be in the driving seat but this is a dual control vehicle where the teacher enables the student to become more active through a symbiotic pedagogical relationship with the teacher moving through a continuum of support and challenge from facilitator to coach, speaker to listener (though in the last instance the teacher can slam on the brakes). Kane (2004, 285) alludes to this as a 'dialectal relationship between methodology and learners, mediated by the educator'. Wang (2009, 479) articulates this relationship as a type of partnership agreement suggesting that teachers and students 'simultaneously serve as both knowledge producers and consumers' where they are both 'partners and co-learners' who 'co-operate, collaborate, and, through dialogue communication, struggle to pursue knowledge'. This relationship ultimately empowers students to assume more responsibility.

Pedagogical implications of active learning

An undercurrent of apprehension concerning active learning permeates some of the literature, and at times this anxiety is overt in the accounts of both educators and students. There are a number of key issues that may act as barriers to engagement in active learning pedagogy. A lack of explicit understanding of this pedagogy appears to contribute to this anxiety (Niemi 2002). De Kock, Sleegers and Voeten (2005) also recognise this potential gap in teachers' practice and suggest this anxiety may also be attributed partly to the traditional emphasis on the recognisable products of learning linked to accountability. This can result in teachers employing techniques less effectively to improve short term results rather than developing longer term skills in metacognition. Another issue is an apparent lack of confidence in educators who feel that engaging in less familiar forms of pedagogy may leave them feeling vulnerable or exposed to criticism from students, peers, managers or superiors (Bonwell and Eison 1991; Niemi 2002; Pundak and Rozner 2008; Snyder 2003). In this type of environment educators may be uncomfortable with the notion of pupils controlling classroom discussion (Wang 2009, 483).

Priestley (2010, 27) identifies 'existing structures and cultures of schools' as problematic citing a number of factors which restrict pedagogical change in particular the accountability agenda which serves to restrict creativity in practice through a fear of risk taking. Priestley (2010, 28) also identifies the time available for activity as a ' key problematic in [Scottish] secondary schools, where the ubiquitous 53 minute period will continue to act as a barrier to the collaborative, experiential and dialogical methods' seemingly linked to current curricular reform. Indeed, the additional time, effort and resources required to develop this form of pedagogy is a recurrent theme in the literature. (Bonwell and Eison 1991; Finlay and Falconer 2005; Halsall and Cockett 1998; Machemer and Crawford 2007; Niemi 2002; Tynjala 1999).

However, Watkins, Carnell and Lodge (2007, 79) offer an alternative perspective suggesting that 'active learning reduces teachers' work or rather shifts it into a different script' since this form of pedagogical approach 'engages the energies, understandings and motivations of learners themselves, so it can be associated with less stress for teachers'. A number of authors cite the pressure on teachers to prepare students for examinations as a limitation on their perceived freedom to use more creative and innovative practices, with a fear that there will be insufficient time available to provide comprehensive curriculum coverage and /or to complete an examination syllabus (Bonwell and Eison 1991; Halsall and Cockett 1998; Kelly 2004; Machemer and Crawford 2007) leading to reliance on more traditional approaches drawing on the metaphor of transmission. Since pupils may require more time to actively construct their own meanings then their rate of progress may be slower (Tynjala 1999). Snyder (2003) agrees in part, but also argues that active learning potentially results in deeper understanding.

Some consider class size an obstacle to active learning pedagogies (Bonwell and Eison 1991; Niemi. 2002) but a number of authors suggest this approach is quite successful with larger numbers of students (for example, Caldwell 2007; Diesel, Alley, Schreiber and Borrego 2006) . However, there exists real concern regarding potential behaviour management issues with a belief that behaviour will deteriorate when students have increased opportunities to interact with others and teachers will feel less in control (Bonwell and Eison 1991; Halsall and Cockett 1998; Machemer and Crawford 2007; Synder 2003). This appears to contradict the notion that active learning engages pupils with the implication of a positive impact on ethos and behaviour. This anxiety over behaviour management links to Niemi's (2002, 777) suggestion that a 'passive learning culture' permeates some educational settings which he considers may be linked to a desire to reduce opportunities for active learning pedagogies.

A specific concern regarding the overt promotion of active learning through group work, in particular cooperative learning, is evident; and there is some apprehension regarding the effectiveness of this approach with the suggestion that student engagement is not wholly dictated by the social factor (Bonwell and Sutherland 1996). Some believe that teachers' lack of understanding of the range of skills needed for effective group work and the time and skill required to enable students to develop appropriate cooperative learning skills can act as a barrier to initiating this work effectively (Snyder 2003), whilst Kimonen and Nevalainen (2005, 627) imply that the demands on pupils to develop social skills concurrently with knowledge and understanding can be problematic. According to Machemer and Crawford (2007) cooperative learning is not always popular with students in the first place. Although promoted as an inclusive approach to education, particular groups of pupils may be less comfortable with this form of pedagogy, for example, 'Students with high academic achievement are the most apprehensive about cooperative learning as this removes them from the teacher-centered paradigm in which they have been successful' (Machemer and Crawford 2007, 12). While anecdotally, teachers have reported that 'lower ability' pupils may also struggle. In both these cases, it may be that familiarity with 'traditional' teaching regimes has resulted in conditioning and a lack of confidence and openness to new approaches.

A significant issue of concern is an apprehension about the effectiveness of active learning since there is a lack of robust evidence beyond the generally anecdotal commentary to support a claim for the merits of this approach. Bonwell and Sutherland (1996) allude to this in their noteworthy early paper and there is still a lack of research to make any particular claim for the wider concept of active learning. There are some claims made for active approaches: in their literature review on *Independent Learning* Meyer, Haywood, Sachdev and Faraday, (2008, 43) cite earlier research by Page (1989) which suggests active learning techniques can increase tests scores and improve motivation; and, Newmann et al. (2001)

cited in Watkins, Carnell and Lodge (2007) have undertaken research which indicates gains in achievement for reading and mathematics when pupils are engaged in active and challenging intellectual work. Machemar and Crawford (2007) voice concern with regard to the efficacy of this approach to develop complex knowledge and understanding whilst Pundak and Rozner (2008) highlight a perceived lack of incentive for the additional input for educators. A further concern is that pupils lacking in confidence or with low self-esteem may be uncomfortable with the peer- exposure of their learning abilities through active learning pedagogies which may result in some students learning to be 'passive' in order to minimise exposure of their failings in the public arena (Watkins, Carnell and Lodge 2007). Interestingly, the issue of assessment in relation to active learning is seldom addressed in the literature: perhaps this underpins an assumption that 'active learning' is no different to 'learning' and that it is only a shift in pedagogical approach. Exceptions are Finlay and Falconer (2005) who suggest assessment is an important issue for consideration in relation to active learning, and Snyder (2003) who suggests there is a need for assessment to change in line with new forms of curriculum and pedagogy. However a number of aspects of active learning are clearly aligned to those promoted through formative assessment or 'assessment for learning' (Black and Wiliam 1998). Wiliam (2009) believes that developing teachers' practice in formative assessment is the key to effective learning and identifies a number of strategies that appear to improve this practice. Two of these strategies in particular seem to accommodate many of the aspects of active learning as articulated in the literature (Wiliam 2009, 13):

> Activating students as learning resources for one another brings in collaborative and co-operative learning, reciprocal teaching… and peer assessment
>
> Activating students as owners of their own learning includes aspects of meta-cognition, motivation, interest, the way learners attribute their successes and failures, and self-assessment.

This seems to suggest that the teachers who embed the strategies and techniques of assessment for learning in their pedagogy will be engaging pupils in many of the activities identified under the active learning banner.

Conclusion

In an educational setting all purposeful learning should be planned through a curriculum that has an appropriate underpinning rationale and suggests suitable pedagogies and assessment to inform and assist those charged with its implementation. Active learning is not a new or innovative discourse, however, given its resurgence and prominence in current policy, the development of clarity in professional understanding regarding its meaning and pedagogical implications is vital in order to support effective and informed educational practice. In order to foster such practice we suggest it is necessary to adopt a broader and more explicit definition. Examination of the literature evidences a somewhat inconsistent picture. The three-fold framework proposed by Watkins, Carnell and Lodge (2007, 71) recognises a variety of perspectives, however, it could be argued that this definition is insufficient in the context of fostering the entrepreneurial subjectivity (Kelly 2006) required of citizens for the 21st century. The framework provides a model which enables educators to consider different aspects of active learning and so begin to deliberate and evaluate the focus of 'activity' in the classroom (the pedagogy). However, we believe a significant aspect alluded to by a number of authors (see for example Keyser 2000 and Stephen et al. 2008) is omitted: the affective dimension. This concurs with Bloom's (1956) taxonomy of learning which recognises the three domains of cognitive, affective and psychomotor learning, and encompasses factors such as pupil attitudes and values, intrinsic and extrinsic motivational factors, and pupil engagement at both individual and group contexts.

The question of whether active learning should be regarded as a theory of learning or pedagogy is also significant in terms of the drivers for its implementation. If it is only a pedagogical construct then it seems incapable of advancing the lifelong learning agenda as currently conceived. However, as theory it is not yet fully determined. We have argued here that active learning should be considered both a 'mindful' (Salomon and Globerson 1987) disposition to learn and a means of fostering this that bridges this divide, and we suggest that this conceptualisation will be of use to researchers in developing more theoretically robust models of active learning.

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[1] In Scotland children begin primary education at approximately four or five years old. Children are entitled to two years pre-school education, seven years of primary school (P1 – P7) and then begin between four and six years of secondary school (S1- S6).

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