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Inquiry-based learning in Higher Education

Pam McKinney

This chapter presents an introduction to the concept of Inquiry-based learning (IBL) and its philosophical underpinnings. I reflect on my experiences as an educational developer, lecturer and scholar of teaching and learning, drawing on my 15 year journey of researching and teaching IBL in Higher Education to discuss why I believe in inquiry-based pedagogies. I have focused my teaching and research on IBL around three central aspects: the relationship between IBL and information literacy, the role of collaboration and group work in IBL, and the role of reflection and reflective writing in student inquiry. I discuss each of these aspects of IBL, and reflect on why I think they are valuable aspects of inquiry, and how each affects the pedagogical choices I have made. The chapter concludes with some more practical advice around how to implement IBL successfully in Higher Education.

My experiences as a learner - the background to engaging in IBL as a teacher

I first encountered Inquiry-based learning as a learner in HE, although I certainly don't recall any kind of labels being applied to the pedagogical approaches that I experienced, or none that were shared with me as a student anyway! As part of my modern English language and Linguistics degree I had assessments where I designed my own small-scale research projects, collected data and generated new knowledge in the discipline, albeit at an Undergraduate level. I now realise that these small-scale research projects embodied the central principles of inquiry-based learning, or IBL. My professional engagement with IBL started in 2005 when I was employed to lead the Information literacy activity of CILASS: Centre for Inquiry-based Learning in the Arts and Social Sciences at the University of Sheffield, which was one of 74 CETLs: "Centres for Excellence in Teaching and Learning". The CETL programme was a national programme of investment in the development of teaching in UK Higher Education. My role was to support academic staff in developing Inquiry-based pedagogies in their subject area, and help them engage with information literacy as a way to support and develop student inquiry. I worked closely with the University library, and also with academics in the department of Information studies (now the Information School) who were experts in IL research (Sheila Webber and Sheila Corrall). Coming

from a background as an academic liaison librarian, this was somewhat of a step-change in activity, and I had to really get to grips with a vast array of new knowledge: academic development, pedagogic research and scholarship, and of course, I had to understand IBL if I was to be its advocate.

What is IBL?

IBL has been described as an "umbrella" term (B. Hutchings, 2007) for a spectrum of pedagogical approaches (e.g. fieldwork, problem scenarios, research projects and experiential learning) that are open-ended, that facilitate student exploration and investigation, where there is no right or wrong answer. IBL aims to put the student at the centre of the learning experience, and provides opportunities for students to direct what they learn and pursue their own subjects (Levy & Petrulis, 2012). This highly constructivist mode of learning and teaching was identified as an essential feature of university education over 20 years ago when the Boyer report was published in 1998 (The Boyer Commission, 1998). This report examined the state of university learning and teaching, and highlighted the failings of didactic, transmissive styles of teaching to prepare students for either further study, or their professional careers (Levy & Petrulis, 2012). The Boyer report stimulated a re-assessment of learning in HE in the UK, and the Higher Education Academy identified a need for new models of undergraduate curriculum that should all incorporate "research-based study" (Ramsden, 2008 p.11). There are some issues to do with the terminology surrounding Inquiry-based learning, including a disagreement about the correct spelling of "inquiry" with many using the spelling "enquiry", although there is no difference in meaning. In addition, there is also terminology used in the general field that is overlapping and to a certain extent, competing. For example, there is some confusion about the difference between Problem-based Learning (PBL) and IBL, essentially PBL is driven by a specific problem that students must attempt to solve, and employs a far more rigid and structured approach, featuring a series of steps that must be undertaken. IBL in contrast is more open, in that the "trigger" for inquiry may not necessarily be a problem, it could be a picture or a piece of research (Hutchings, 2007). Other terms that are often used synonymously with IBL include "Research-oriented Teaching", or "Research-based teaching" which both emphasise learning about and through research, although it is "research-based teaching" that is most closely linked with IBL (Healey, 2005).

Pedagogies based on student inquiry are perceived to offer the potential to engage 'deep' learning and to support the development of capabilities and dispositions - such as critical reflexivity, initiative and social responsibility - that are identified as fundamental not only to academic practice, but also to engaging in academic *communities* of practice (Brew, 2003; Healey, 2005). IBL is characterised by a belief in student autonomy, student ownership and student responsibility for the learning process (Levy & Petrulis 2012), and can provide opportunities for students to become better equipped to engage with a world that Barnett (2000) has characterised as 'supercomplex'.

IBL is based on constructivist and sociocultural theories of learning (Spronken-smith, Walker, Batchelor, O'Steen, & Angelo, 2011). With constructivist theories, knowledge is seen as something that is inherently constructed by the individual based on their experiences and previous knowledge (Twomey Fosnot, 2005). I don't think I'd ever thought much about the learning process before working as an educational developer - I knew what I liked, and I knew that largely I had been successful as a learner in school and at University, but I didn't know any more than my personal experience. The work I undertook with CILASS gave me the time and space to think about my own conceptions of both learning and teaching, and this has carried on throughout my professional career, supported at various stages through formal development e.g. the Postgraduate Certificate in Learning and Teaching in higher education, and my research and scholarship into my own teaching, which formed the basis for a PhD by publication (McKinney 2018), and my experience of teaching in Higher Education.

While I was working as an educational developer I had my "lightbulb moment" - for me it was the realisation that people don't necessarily "learn" just because they have been told something. It seems obvious, but a lot of formal university teaching seems to rely on this basic assumption. Thinking about the meaning of learning encouraged me to reflect on my own learning experiences, and my teaching practice as a new information professional. Although I had experienced IBL as a student, a large part of my degrees were "taught" to me using transmission approaches, i.e. lectures. As an academic librarian, much of the teaching I did involved telling students about the library and its services, and how to get the most out of them through improved IL practice. The limit of my engagement with constructivism was asking students to complete a structured worksheet for a little bit of interaction and activity. Both my lecturers, and I, fell into the mode of understanding learners as vessels to be filled with

knowledge (Skinner 1954), which involves positioning the tutor as the expert who holds all the knowledge cards. These are referred to as "transmissive" theories of education, based on the premise that information can be transferred from the expert to the learner, that knowledge is static (Dewey, 1938; Freire 1970). In this view of education, learning is "mechanistic" and is seen to be a series of steps to climb, and teaching is driven by the need to achieve "results" (Thomas & Seely Brown, 2011). Understanding the central difference between constructivism and transmission as two contrasting theories of education was fundamental to developing my personal philosophy of teaching. In a constructivist view of learning, acquiring knowledge is not seen as the primary goal of education. As Bruner (1966, p.72) states "We teach a subject not to produce little living libraries on that subject, but rather to get a student to think … Knowing is a process, not a product". I identify with constructivism partly because so much "knowledge" quickly becomes obsolete, and any professional should aspire to continually develop their understanding of their subject and the landscape in which they operate. Pedagogical approaches based on constructivism focus on the process of learning, and in supporting learning how to learn. This is one of the reasons why I include reflective assignments in my teaching, so that learners are rewarded for taking time to examine their own learning processes. The aim of IBL to promote student ownership of their learning really chimes with what I found to be the most interesting, and ultimately useful, aspects of my own learning experiences of learning at University that enabled me to move from being a consumer of education to an active participant in a learning process. One of my goals as a teacher is to provide opportunities for my students to experience this conceptual shift in their own experience of learning.

However, the open-ended and student directed aspects of IBL are often what can make IBL a challenging prospect for both teachers and learners. With transmissive theories of education, all the power rests with the teacher: they decide what is to be learnt, and how, and they are either imparting knowledge to the class or directing learner activity quite closely. With IBL, learners are encouraged to take ownership of their learning, they are far more in control of the content of what they learn, and are freer, indeed encouraged, to challenge and question the teacher in the classroom. I believe that learners who are in control of what they learn are more invested in the learning process, and develop abilities to direct their own learning in the future. My students are only in contact with me for a short space of time, but ideally they go on to be lifelong learners. Learners bring

so much to the classroom, IBL can facilitate the sharing of learners' knowledge and expertise. I feel I am able to learn from them as much as they can learn from me. This aspect of IBL can lead to positive outcomes for students in terms of empowerment, intellectual freedom, greater personal authority and a greater sense of identity with the discipline (Levy & Petrulis 2012). However not all learners welcome this autonomy, and for some, IBL can lead to feelings of frustration, and dissatisfaction, almost as if they are not really being taught "properly". One student who engaged with IBL through the CILASS programme stated *"Inquiry-based learning, it can help, but I'd like to say - don't go too far, don't move away from actually teaching - it can complement, like, it can help."* Familiar transmissive modes of education can be found to be easier to engage with, and correspond more closely to conceptions of the roles of both learner and teacher (McKinney 2014). Teachers should recognise these challenges of IBL in their own practice and the practice of learners, and later in the chapter I look at some of my lessons learned in how to address some of these challenges.

IBL is seen as a way to strengthen the links between research and teaching in HE (Brew & Boud, 1995), as it requires students to actively engage with the knowledge-base of their discipline, and also support students in the creation of genuinely new knowledge and insights (Levy, Little, Mckinney, Nibbs, & Wood, 2010). Developing the relationship between teaching and research is often touted as an ideal in research-led universities, but often it is conceptualised as informing students about the latest research, and students being taught by lecturers who are active researchers, rather than as students actually doing the research themselves. Through inquiry, students have opportunities to engage directly with open-ended problems that are drawn from the disciplinary context or professional practice, and this can provide an introduction to research communities. Hodge, Haynes, LePore, Pasquesi, & Hirsh, (2008) argue that inquiry-based pedagogies are essential in developing in students the intellectual stance and attitudes associated with 'self-authorship' - which they assert is a central goal of undergraduate higher education. Baxter Magolder & King (2004) define self-authorship as an awareness that knowledge as constructed, fluid and contested, and a belief in the possession of the capability to create new knowledge, and the ability to participate in the community of knowledge production. IBL encourages learners to let their curiosity and their urge to develop their understanding lead their explorations in their subject (Justice et al., 2007). The ACRL information literacy framework has several similarities with these conceptions of higher education and the value of inquiry, for example, the view that IL involves developing understanding

of knowledge creation processes and research as inquiry (ACRL 2016), and I discuss the relationship between IL and IBL later in the chapter. Although not all students go on to be researchers, many of the students I teach will engage with research as part of their professional activities. IBL enables them to build capabilities to identify avenues for research and the confidence to pursue these in the context of their job roles. In this way the profession is enriched, and insights shared within and beyond organisations.

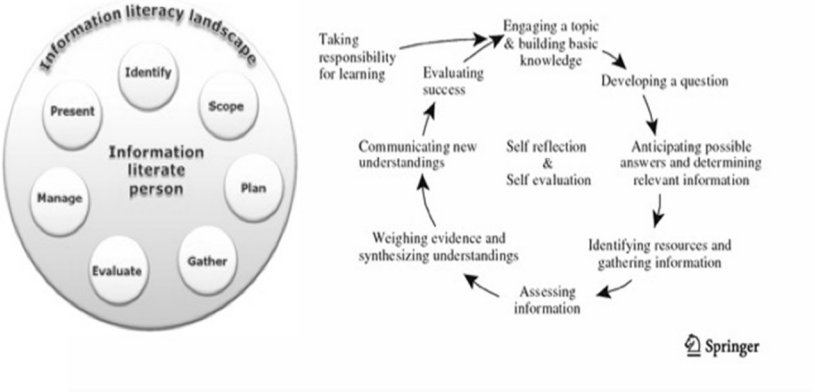
IBL is seen to be a vital aspect of education in Universities, and involves student-led interaction with information and knowledge. It is these aspects of IBL that really provide the reason why it is so important to address information literacy (IL) in the context of IBL. In order to be effective inquirers, students have to be adept at finding, using, evaluating and managing information, the skills and capabilities that are at the heart of the concept of "Information Literacy". Librarians have a vital role to play in supporting IBL, and can adopt an inquiry-based ethos to their own teaching.

The relationship between IBL and IL

My research and evaluation that took place as part of the CILASS programme highlighted the close relationship between IBL and IL (McKinney & Levy 2006; McKinney 2014), and research with students found that they can experience IBL as a process of "gathering information", and modes of student inquiry are heavily dependent on students engaging with existing published research - the "knowledge base" of their discipline (Levy & Petrulis 2011). Both CILIP and the ACRL, who represent a critical mass of librarians interested in information literacy and how it is taught, have linked inquiry and IL in the definitions and support materials they have produced. The new CILIP IL definition (CILIP, 2018) states that IL is particularly relevant for students engaged in inquiry-based learning, and cites the context of the Extended Project Qualification that is an option for students in the last years of secondary school.

When I first discovered this Justice et al., (2007) model of IBL I was immediately struck by the similarities between that, and the SCONUL Seven Pillars model of IL, particularly in diagrammatic format. Seen side-by-side, we can see the inquiry process mirroring the the IL competencies required in Higher Education, for example both highlight the need to identify an information need, and develop appropriate questions, both identify the information searching and gathering processes, the activity of

sifting and evaluating and the need to communicate information effectively.



IBL figure from Justice et al, 2007.

This is a teaching resource that I use in the Information Literacy modules, as part of the work we do on pedagogy for information literacy, and it is a useful prompt to open up discussion about the relationship between IL and IBL. The discussion of my research on IL and IBL encourages students to think about their future roles as teachers, and combined with other activities, to think critically about the kind of teacher they want to be. This module is a site of further Scholarship of Teaching and Learning activity (Webber & McKinney, 2019).

When I was exploring the literature on IBL, I found plenty of examples where the need for effective use of information was highlighted as an aspect of IBL, although somewhat disappointingly from the perspective of the IL community, the specific term "information literacy" was largely absent. I found definitions of inquiry that focus on students' abilities to find and use information effectively as part of the inquiry process (e.g. Bachman, 2014), and there were numerous examples of statements about the nature of IBL requiring sustained interaction with information, e.g. "conducting research (library, internet), assessing evidence, writing up and presenting the results"(Chiapatta Swanson, Ahmad, & Radisevic 2014 p.55). This lack of use of the term "Information literacy" is indicative, I

think, of the difficulties librarians have faced in developing awareness of the terminology of IL with academic staff (McGuinness, 2006), although there are widely held conceptions in academics of the need to be information literate (Webber, Boon & Johnston 2005).

However, the practitioner librarian literature around pedagogy for IL, which also comments on the relationship between IBL and IL, seems more comfortable with explicitly making the links between the two concepts. For example the ANCIL framework (Secker & Coonan, 2011) states "Active or inquiry-based learning is a vital part of developing information literacy." (p.6) and lists CILASS as one example of "good practice in Information literacy" (p.33). The book by Hepworth & Walton (2009) which features strategies to teach IL using IBL pedagogies is a good example of practically oriented material written for librarians to develop teaching practice in the field.

The CILASS projects I was involved in, and I should stress here that the vast majority of the ideas behind these developments came from academic staff, were developed in conversation with me and also with librarians, and generated a suite of ideas for the integration of IL into IBL. There are a number of examples presented in the papers I write based on CILASS evaluations (McKinney 2013 and McKinney et al. 2011). Evaluation of the CILASS projects revealed that generally students were able to recognise the value of the information literacy competencies they developed alongside their IBL, and were able to identify that being information literate supported their academic work generally, and would be useful for their everyday lives. In my own teaching I have tried to make information literacy development an explicit aspect of the inquiry- based approach, for example through dedicated support and scaffolding in searching information resources, defining information literacy related learning outcomes, and including information literacy focused reflective assignments. I want my students to develop their conceptions of information literacy, even if it is not the subject focus of the teaching, and to be able to understand how their emerging and developing information literacy fits within their overall approach to learning.

So the close connection between IBL and IL has been established in both the general learning and teaching literature, and the IL literature, and it follows that librarian involvement in the design of IBL is important in order to create the support that students need. The following section offers some reflection on how that might happen.

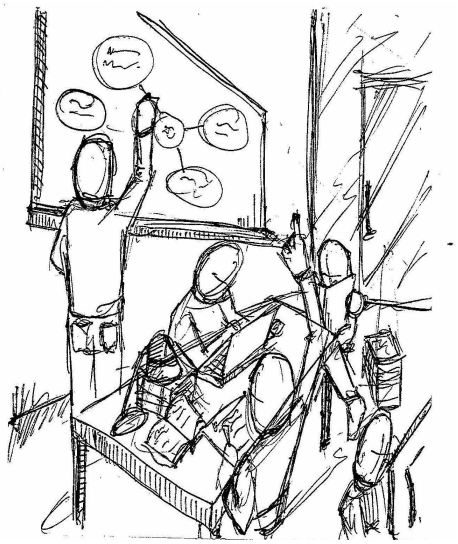
Developing IBL as part of a multi-professional team

There are examples in the literature of where a team-based approach to developing IBl and IL in tandem has been taken. Ashley, Jarman, Varga-Atkins, & Hassan (2012) present an inquiry-based approach to teaching learning literacies that involved academic staff, learning technologists and librarians working together to design and support an assignment that involved students collaboratively creating a wiki. In my roles in CILASS I worked closely with the library and academic departments to identify activities that would benefit from specific IL support and where librarians could make a positive contribution to the inquiry design and support. My role built on the already strong relationships that librarians had with academic staff by providing more specific contexts for the partnerships to develop, facilitated by the project funding. Support ranged from activities such as librarian drop-in appointments held in the department, support with the design of the virtual learning environment, adaptations to existing online IL tutorials, collaboration to develop assignment design and marking criteria, and adaptations to face-to-face support sessions led by librarians. Working as part of a multi-professional team focused on educational development was a great experience, and being able to draw on different areas of expertise supported the creative design of IBL (McKinney, Wood & Little 2009). One aspect of the CILASS project that was particularly beneficial to librarians was in developing their pedagogical expertise through a programme of workshops. Reflective evaluations of these workshops indicated that librarians really valued this opportunity to explore IBL pedagogy in more detail, and felt that the experience made them more confident to discuss IL in the IBL context with academic staff (McKinney 2013). Other authors have also picked up on the need for librarians to have greater confidence to become involved in the conversation around teaching and learning in their institutions (Saunders, 2012). Taking up any development opportunities that are available, such as the Postgraduate Certificate in Higher Education, and attending internal and external teaching focused development events is a good way to build confidence.

Group work and IBL

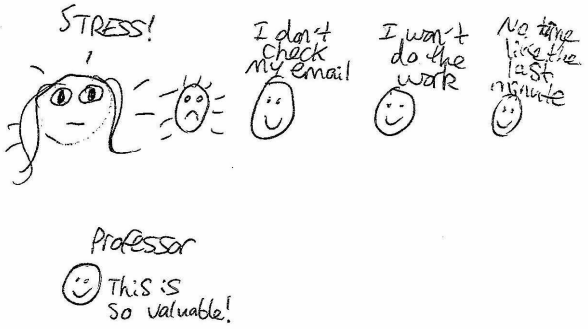
The idea that people learn when they collaborate with each other, and develop new understandings through working together, is a central feature of constructivism (Grabinger & Dunlap, 1989). As Lambert et al. (2002) state "Learning is a social activity that is enhanced by shared inquiry" (p.

26). Educational theorists such as Dewey have long recognized the role of collaboration in IBL (Dewey, 1916), and the development of theories such as the 'Communities of Practice' (Lave & Wenger, 1991) are based on this premise that learning is a social process and requires interaction and collaboration, and that meaning is socially constructed. This underlying theoretical background to IBL is the reason why much inquiry involves students working in groups (although not all group work is inquiry-based!). According to Johnson & Johnson (1999), notable proponents of the value of group working, people working in groups have higher productivity, and higher levels of achievement than people working independently. It is argued that working in groups has a range of benefits for members including better retention of information, greater use of critical thinking, greater persistence with challenging tasks, and increased ability to transfer learning to new situations than working individually (Johnson, Johnson, & Smith, 2007). Successful groups have discussions that support knowledge construction, and support members' motivation and engagement (Askell-Williams & Lawson, 2005). One finding from the CILASS evaluation was that collaborative working helped students distribute the workload of IBL and made assessment seem "less daunting". (McKinney 2013). The IL community has also recognised the value of collaborative learning for IL pedagogies (Diehm & Lupton, 2012), as learners can share knowledge and experiences with their peers, and understand different perspectives. When group work goes well it clearly has substantial benefits for students as illustrated in this powerful representation of a dynamic and productive group.



Although university education should not be seen simply as training for employment, the fact remains that students will have to find jobs at the end of their course of study, and employability has to be an important aspect of degree programs. As the employability lead for my department I have worked closely with employers, and they have told me clearly that they desire to recruit graduates who can work well with others, and this view is supported in the HE literature (Race, 2007; Volet & Mansfield, 2006). Working collaboratively in small groups at University gives students the opportunity to build team working skills and prepare for their professional lives (Rafferty, 2013), and this need for skills in cooperation, networking and partnership is recognized by professional bodies such as CILIP (CILIP 2017).

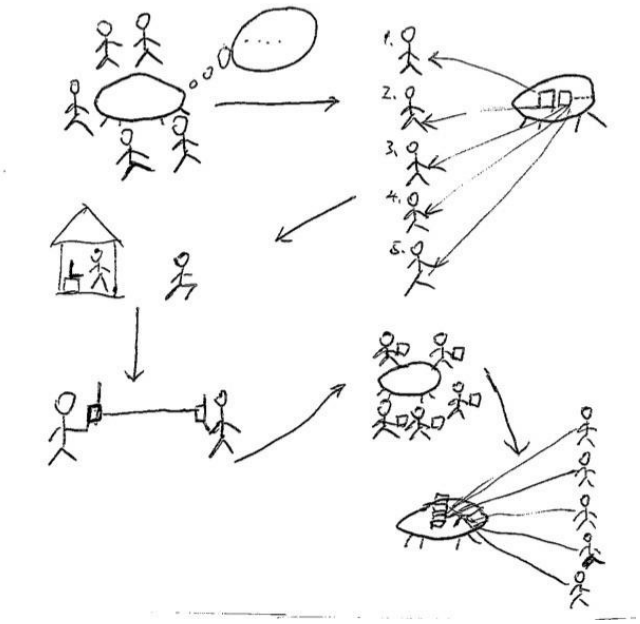
However, despite this generally accepted need to develop team working skills for professional development, and enthusiastic endorsement of the value of collaborative learning by academics, students can have very negative perceptions and experiences of group work. Groups can struggle with the adoption of different roles in the group (Johnson & Johnson 2003), with issues of leadership and authority (Cartney & Rowse 2006), with reconciling different academic goals in group members (Belluigi 2014), and with free riding or "social loafing" (Clark & Baker 2011). This disconnect between the positive framing of group work by academics, and the lived experience of students is illustrated perfectly by one of the drawings I collected in my research into student conceptions of group work (Mckinney & Cook 2018):



My research into group work was stimulated in part by this disconnect between the views of students and academics. It is quite challenging to champion the idea of group work as a transformative learning experience when faced with students' discontent with the group work process. Through my teaching and pastoral roles I have seen plenty of evidence that the emotional and academic consequences of problematic group work experiences can be devastating, and I can't think of another type of learning task that produces quite the same level of frustration and negative feedback as group work. Nevertheless, despite these issues, I remain convinced that group work has substantial benefits, if framed and supported in the right way.

My experience of implementing IBL with collaborative inquiry has taught me that it is vital to support groups working effectively. Sometimes, it is simply the logistics of group work that foil students, particularly as they now have so many competing demands on their time. Arranging meetings either face-to-face or online, deciding on which platform to use as a communication medium, agreeing which work can be accomplished individually by group members, and which needs to be addressed as a group, are all part of the slightly hidden yet enormously important tasks associated with group work, and teachers in Higher Education need to be aware of this additional burden. We know that team working is vital for the workplace, but often in the workplace these issues with group management are smoothed by organisational technologies and behaviour norms. Simple strategies such as timetabling opportunities for groups to work together, and providing opportunities to discuss the group work with a tutor can really make a difference to the success of group work.

My previous research (McKinney 2018) has revealed the non-linear and complex nature of group interactions, which mean that group members have to work both together and separately, and to divide the tasks in a meaningful way. This is illustrated by a further example from the drawn data I collected from students in the information school:



I find viewing group work as a process is a useful prompt for reflection about the support students may need, and at what stage they might need it. For students, taking a reflective approach to group work is useful, and ideally this can be stimulated at the beginning of the group work process, and if appropriate, extended with assessed reflective writing on the group process. There are many ways that a reflective approach to group work can be stimulated, but I have found that the group work drawings are a good way to encourage discussion about underlying assumptions, priorities and modes of group working that can be beneficial to group functioning.

IBL and Reflection

My interest in reflection and reflective writing began during the CILASS years, when project leaders asked students to engage in reflective activities as part of their IBL designs. This was seen as a means to develop a focus on the process of learning, rather than simply the product, and consistent with the constructivist philosophy underpinning IBL - that knowledge is a process not a product (Bruner 1966). Bruce's (2008) concept of "informed learning" stresses the need for learners to reflect on their own learning as they engage with information, and this develops their awareness of the process of learning.

Reflection can help learners reconceptualise their view of the world as one that is constantly changing, and can help develop a sense of agency, i.e. that the individual can effect change in their environment (Wharton, 2012). The self-questioning and self-critical mindset promoted through reflective practice is a key aspect of personal growth and development, and is intrinsic to learning (Boud 1999)

Reflection can be defined as:

> The process of engaging with learning and/or professional practice that provides an opportunity to critically analyse and evaluate that learning or practice. The purpose is to develop professional knowledge, understanding and practice that incorporates a deeper form of learning which is transformational in nature and is empowering, enlightening and ultimately emancipatory. (Black & Plowright, 2010, p.246).

Some authors have identified that reflection and self-evaluation are essential aspects of IBL (Spronken-smith et al., 2011), Secker & Coonan (2011), in their "New Curriculum for Information Literacy" also centralise the role of reflection in supporting students to develop understanding their information environment, and identify the role of reflection in the curriculum. The ACRL framework for IL (ACRL, 2016) defines IL as a *reflective* process of the discovery of information, and the understanding of the production, value and use of information. A number of the CILASS projects required students to engage in reflection about their IL development, and this was seen to be a means by which students could come to recognise the IL competencies they had developed. I have implemented this approach in my own teaching with an assignment that required students to write reflectively about their experiences of working in a group (McKinney & Sen 2016), and their perception of the development of their IL (McKinney & Sen 2012) while undertaking a group IBL project. The information literacy modules I teach on uses two reflective assignments, one about the development of IL competencies and one about the design of an IL intervention (Webber & McKinney 2019).

A number of IL researchers and practitioners have published about the importance of reflection to IL. Corrall's (2017) extensive review of reflective practice in IL educators, and the place of reflection in IL pedagogy is indicative of the growing interest in reflection and reflective writing in the IL community. Blanchett, Powis, & Webb (2012) state that "encouraging reflection is a major aim of information literacy teaching" (p. 36), as a route to facilitating lifelong learning. McCulley & Jones (2014)

discuss the use of a reflective journal to support IL development, and McNicol & Shields (2014) present a model of IL education for schools that supported what they call the "five features of 21st Century learning" including both reflection and collaborative working. There is agreement from many research projects that reflective writing from students can provide evidence for educators of the development of IL competencies. My research and others have shown that writing reflectively about IL supports students in understanding the value of IL to their studies and for the future (McKinney et al., 2011; McKinney 2013; Lahlafi et al., 2012).

In my research I have used the reflective writings of students as data for research, with the appropriate ethical approval and permissions. I use the 7 Pillar Model (Sconul 2010) as a way to understand the breadth and subject of students' reflections, and a model of reflection (Moon, 2007) to assess the depth of their reflections. Reflection is personally important to me, I find both informal reflection, including discussions with a teaching team, and formal reflection through appraisal processes and publications such as this, leads to growth and development. I want to continually improve my practice as a teacher, and reflection helps me to do this.

Enacting IBL in my own teaching practice

Despite advocating IBL for nearly five years, when I first had the opportunity to enact IBL for myself as a new lecturer, quite frankly it was terrifying. What if the students found out how little I felt I knew? What if the group work collapsed into acrimony? What if they hated the mode of learning and challenged me in front of the whole class? What if they all failed? I mentioned earlier the uncomfortable nature of IBL and the changing roles of teacher and learner, and I admit I was tempted to retreat to the lecture as a way to impose my control on the learning space. However, while I do believe there is a place for the lecture in Higher Education, talking at students is not what excites me as a teacher. I would much rather give them the space to engage with learning materials in a more active way, to talk to each other and to me, and to develop their own conceptual understandings. I'm pleased to report that my first IBL module did go well, the groups functioned and produced high quality projects, the students all engaged actively with the inquiry, the module evaluations were positive. It was a massive relief, and it gave me a lot of confidence to continue using inquiry-based pedagogies. One realisation I've had is that the teaching work associated with IBL shifts in focus. I find that my time is spent preparing and designing inquiry-based activities and assessments, and

designing material that can provide support asynchronously i.e. outside of face-to-face sessions. For example this could be providing feedback on aspects of the assignment, or facilitating discussion boards. In the sessions themselves, comparatively less time is spent in "delivery", but the presence of the tutor to frame tasks and provide feedback is really important.

It's important though to reflect on why my implementation of IBL was a success, what it was that enabled the positive outcomes I and the students experienced. Partly, I think, it was because I was able to bring students on a journey with me, and empower them to recognise the knowledge and experience they could apply to this inquiry project. This is a very different ethos from a more transmissive style of teaching which would position the teacher as the source of knowledge in the classroom, instead I encouraged my students to find out information for themselves, and apply it to the inquiry tasks. In this way they become the experts and the creators of knowledge. I see IBL as a pedagogy that seeks to bridge between academia and professional through hem to make the most of their inquiry as an opportunity to bridge into their professional lives The students in my first IBL class could probably tell I was anxious about the success of the module, and they certainly knew that I was a novice lecturer, but I made sure that the design of the teaching and assessment was water-tight, in order to inspire confidence. Another way that I try to ensure that students have a productive and enjoyable experience of IBL is through the detailed support I provide. Appropriate support and scaffolding of IBL for learners is absolutely vital, and I've found that one of the best ways to work towards successful IBL is to discuss the teaching approach with learners and make explicit the expectations and perceived benefits of engaging in IBL. As my teaching has developed and I've taught across a greater variety of modules with diverse students, I employ a range of techniques to scaffold and support inquiry. As mentioned above, if the inquiry requires students to work in groups then it is imperative that students receive support and guidance on the mechanics of collaborating.

Reflection is a powerful tool in the armory of an IBL teacher, and can be employed in different ways to support the development of students, and their capabilities, and supports self-awareness of that development. Students need support to develop their reflective practice, and I and colleagues in the Information school have developed a support structure for our students around reflective writing. This includes developing awareness of reflective theory as well as practical support for reflective writing. We run workshops, provide examples of reflective writing, and also examples of teaching material about reflection produced by students.

Freire (1970) links reflection and reflective practice to IBL, and acknowledges that reflection on both the part of the learner and the teacher are important. I strongly believe that reflection is an important aspect of professional practice of educators, and also information professionals (Corrall, 2017; Sen, 2010). The CILASS project and programme evaluation was highly reflective, and involved critical reflection by a project team of interventions and their effects on learning and other desired organisational outcomes (Hart, Diercks-O'Brien, & Powell, 2009). The Scholarship of Teaching and Learning (often abbreviated to SoTL) is one way in which reflective practice of teachers can be framed, and I've certainly found enormous benefit in researching and publishing about my own teaching. SoTL encourages engagement with the literature on teaching and learning, and the formal collection of data from students about their experience of learners, both of which help provide an evidence base for improvement. I have found Entwistle et al.'s (2004) model of the teaching and learning environment useful for supporting shared reflective practice (see Webber & McKinney 2019 for a longer reflective exploration of teaching using this model as a framework).

Not every learner desires to be the centre of their learning experience, particularly if they are used to transmission styles of teaching that are still very common in most students' educational history. IBL requires learners to take ownership of their learning, and for many this is a leap into the unknown, and the open-ended nature of IBL can be very uncomfortable. Many prefer assessments that are very clearly defined, so they feel they can understand where to focus their efforts and there is less danger of failing. In contrast IBL assignments which might be perceived to be too open, and therefore more difficult to make sure that effort is focused on achieving higher marks. Detailed and wide ranging support for assignments that enables students to feel free to embrace their own agency and take ownership of the assignment is really important, and I have used strategies such as providing FAQs, example assignments from previous years and dedicated assignment workshops.

Conclusion

In this chapter I have tried to provide some of the theoretical background to IBL, the more teaching I've done, the more I have found teaching theory to be beneficial as a way to understand my own beliefs and practices around teaching. The theory of constructivism, in particular, which rejects the idea that learners need to be filled with knowledge, is fundamental to

my conception of teaching, and my role as a teacher. In Prosser & Trigwell's (1999) typology of approaches to teaching, I would place the majority of my teaching in conception D "A student-focused strategy aimed at students developing their conceptions", and possibly some teaching where I edge into Conception C which is more focused on *changing* conceptions. Luckily I am given the time and space, and control with which to enact this philosophy of teaching.

The value of IBL in more closely linking teaching and research is important to me. IBL provides the means by which learners in Higher Education can develop into researchers, and more closely connect with academic practices. Brew (2003) proposes a model of university education that is an academic community of practice that includes students, researchers, lecturers and professional services staff, in this model "research and teaching are both viewed as activities where individuals and groups negotiate meanings, building knowledge within a social context.". Multiprofessional teams, and involving students as partners in educational development can both support this model of university education. I have focused here on three specific aspects of IBL: IL, group working and reflection, but there are other aspects to IBL design such as the use of Technology Enhanced Learning, and the peer support for inquiry, and these could be other avenues for exploration if I have piqued your interest in the approach. One key takeaway message though is to think very carefully about how inquiry is facilitated and supported, as without this structural support it can be a daunting approach for students.

Being a reflective teacher is important, and while there are formal ways to do this through SoTL, informal reflection, and thinking deeply about teaching can drive improvement. However, SoTL encourages me to engage with the literature, which enables me to look beyond my own knowledge and experience and think about learning and teaching more broadly and how to plan teaching for people who aren't like me. Teaching improvement is a continuous and evolving process, and one which I think is essential to my own professional development.

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