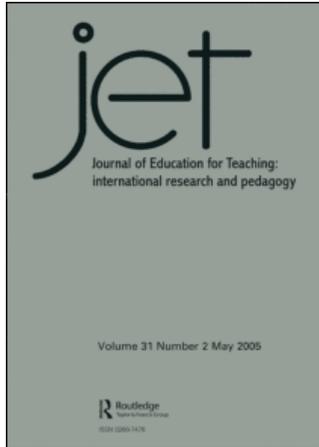


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Student teachers, special educational needs and inclusion education: reviewing the potential for problem-based, e-learning pedagogy to support practice

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Northern Ireland has invested heavily in the use of technology enhanced learning at all levels of education. Alongside this, radical changes to the school curriculum and the planned move away from academic selection towards a more inclusive system are challenging those involved in Initial Teacher Education to find ways to improve teaching and learning for more inclusive classrooms. This study reviews a pilot programme that integrated problem-based and blended e-learning pedagogy to support student teachers learning in the area of special needs and inclusion education. Findings indicate that using a carefully constructed blended programme can effectively support key teaching and learning aspects of pre-service training and help develop skills in critical reflection. It also offers initial teacher educators in Northern Ireland insight into some of the most pressing problems experienced by student teachers during training, and provides a rationale for continued programme development.

Introduction

In response to an increasing commitment toward the principles of inclusion, those delivering Initial Teacher Education (ITE) programmes have been challenged to ensure new teachers are prepared to effectively support all learners within inclusive classrooms. However, inclusion is about more than a mere consideration of the place where pupils attend; it is also about ‘the quality of the school experience and about how far they are helped to learn, achieve and participate fully in the life of the school’ (DfES, 2004, p. 12). Across the UK, student teachers are now more likely than ever to experience teaching pupils whose learning is monitored through an Education Plan (EP). They need to be equipped to support differing special educational needs

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that may include general learning difficulties, varying levels of emotional and behavioural problems, a variety of health conditions, speech and language difficulties, and those to whom English is a second language.

Current UK policy is that where possible pupils with special educational needs (SEN) should have their educational needs provided for within mainstream schools. Alongside this, however, there are continuing debates as to the demands of improving resources and teacher education. All teachers are initially trained in mainstream schools and 'special' initial training is not favoured as a discrete approach in the UK.

Research suggests that the level of support teachers receive can influence attitudes to SEN (Avradimis *et al.*, 2000a; Leyser & Tappendorf, 2001) which in turn may strongly affect the successful implementation of more inclusive systems (Carrington, 1999; Stanovich & Jordan, 2002). The present study reports on a teaching and learning initiative designed with the aim of building student teacher confidence and competence for inclusive classroom practice. It used a blended problem-based learning approach and was offered as an elective programme within a one-year Post Graduate Diploma in Education (PGCE) at the University of Ulster in Northern Ireland. The programme set out to enable participants to build their knowledge of special educational needs, their understanding of issues relating to inclusive education and to provide practical, collaborative support during time spent on school-based practice.

Blended learning in this context should be viewed as the combination of the following pedagogical approaches, problem-based learning, face-to-face classroom-based learning and e-learning. During periods spent in the university, problem-based learning offered opportunities to discuss critical concepts on which to base collaborative activities. The use of synchronous and asynchronous chat through the regular use of WebCT, a virtual learning environment (VLE), was used to encourage and develop the student teachers reflective skills when on school-based practice.

The use of online teaching environments in higher education has increased significantly in the past decade. Participants in online programmes are not restricted to the traditional face-to-face classroom environment because they can access their classroom at any time through the Internet. Threaded or live discussions are available and are particularly useful for those completing ITE programmes because they can help to maintain the feeling of group cohesion and support that are often lost when student teachers are on extended periods of school placement.

An integrated qualitative approach was used as the evaluation strategy for the programme, combining analysis of transcripts taken from online discussions alongside the results of a questionnaire administered on completion of the programme.

Background and research context

Since the publication of the Warnock Report (DfES, 1978) there has been a combination of equality and human rights legislation and strategy documents in the UK—*Disability Discrimination Act* (1995), *Excellence for all children: meeting special*

educational needs (DfEE, 1998), *Meeting special educational needs: a programme of action* (DfEE, 1998), *The Special Education Needs and Disability Act* (2002), *The special educational needs code of practice* (DfES, 2001)—so that today inclusion could arguably be considered to be the ‘keystone’ of government policy on education (Booth *et al.*, 2000, p. 15). It was however, *Removing barriers to achievement* (DfES, 2004) that set out the UK government strategy for SEN offering a strong commitment to inclusive education and an overview as to how this strategy would be employed over the next 10 years. Within it is the expectation that every teacher would teach learners with SEN and that they should be ‘equipped with the skills to do so effectively’ (p. 56).

Though part of the UK, Northern Ireland has been relatively self governing for periods of its history and continues to use academic selection as its educational model for post-primary schooling long after the rest of the UK has embraced a more comprehensive system. At age 11 pupils are tested in English, mathematics and science and on the results of these tests are selected for their post-primary schools. This examination has become known as the 11+. Issues relating to inclusion are therefore problematic as it has been difficult to reconcile the guiding principles of inclusive education with this model. Northern Ireland is also emerging from a long period of internal conflict and alongside growing political stability there have been some major developments within education. A large-scale revision of the curriculum and a number of reports dealing with the issue of post-primary provision (DE, 2001; DE, Northern Ireland, 2004) have led to a recognition that changes are necessary to ensure that all pupils receive a more inclusive experience. By 2008 the 11+ is to be set aside. The Special Education and Disabilities Order (NI, 2005) has now been adopted for implementation in the province bringing it in line with the rest of the UK and issues about supporting inclusion and inclusive practices are now to the fore of local educational debate.

While finding ‘evidence of good practice in schools in integrating pupils with a statement of special educational needs into mainstream classes’ (p.25) the Education and Training Inspectorate (ETI) report (DE, 2004a) identified preparation for inclusive education as a key issue for mainstream schools, particularly at post-primary level stating:

the need for a policy commitment to inclusion has been highlighted: such a development is crucial to the overall promotion of better practices across schools, when including pupils with special educational needs in mainstream classrooms. (p. 25)

The report also found that teachers ‘regard relevant and continuous training as their most important priority’ (p. 23), going on to recommend:

a fundamental review of in-service, and initial teacher education (ITE), focusing on the extent to which the courses deal with special needs’ issues. Such a review should bring forward recommendations related to supporting the increasing needs of teachers in mainstream schools. (5.3.12)

Despite these recommendations, those teaching in special schools, or who are currently responsible for learners with SEN in mainstream schools, have not been required to gain additional qualifications and there seems no plan in place to address

this problem. Lack of an effective training approach to support teachers (and also those in pre-service) to become inclusive educators could have a potentially negative affect on the successful adoption of a more inclusive culture within Northern Ireland schools.

The need for effective training for inclusion

Studies of both pre-service and in-service teacher attitudes towards inclusive education have shown that attitudes were influenced by the amount and type of education and academic preparation they received (Wilczenski, 1991; Avramidis *et al.*, 2000a). Improving and increasing training provision at the pre-service phase of teacher education should therefore offer an effective method of promoting better attitudes towards inclusion (Martinez, 2003). Slee (2001, p.120), for example, suggests that teacher training programmes should provide a programme of 'interdisciplinary studies of exclusion and inclusion' with the aim of 'weaving the preparation for inclusive teachers right across the fabric of their teacher-training curriculum'. Research has also suggested that providing appropriate, quality preparation is an important factor in ensuring successful inclusive outcomes (Shimman, 1990; Beh-Pajooh, 1992). Opportunities for open discussion about concerns relating toward inclusion can only help to develop confidence when teaching in an inclusive classroom.

There is then an imperative for pre-service programmes to develop ways not only to promote positive attitudes towards inclusion, but also to provide learning programmes that support new teachers to work effectively with pupils who have diverse special educational needs within the mainstream classroom. Martinez (2003, p.478) suggests that the 'reality of inclusive practices warrants research that investigates best practices'. Wilkins and Nietfield (2004, p. 119), on completion of a school wide inclusion training programme, concluded that 'training programmes should be re-evaluated' with the aim of improving teacher preparation for increased diversity in the classroom. In their study of student teachers' attitudes to inclusion in Northern Ireland, Lambe and Bones (2006b) found that early in the ITE phase of training many student teachers had not yet formed clear opinions about teaching in an inclusive setting. They cited this phase of teacher education as a key opportunity to influence positive attitudes by providing a carefully designed teaching and learning programme about inclusion.

While research would concur as to the importance of positive attitudes and the need for increased efficacy through training and preparation, it is less clear in suggesting the kind of methodological approaches that can best ensure such efficacy. Those responsible for ITE are charged with the design and implementation of teaching programmes that will equally support practice and promote positive attitudes towards inclusive education. Within this responsibility is implied an underlying assumption that providers are themselves skilled inclusive educators who also hold positive attitudes towards inclusion. While this may or may not be the case, it is worth noting that for some ITE tutors finding effective means to support student

teachers for inclusion may also present a potential challenge to their own perceptions of efficacy and to personally held beliefs and values. In seeking to improve current practice, an elective programme for special educational needs and inclusive education was developed to support student teachers on a one-year post-primary, Post Graduate Certificate in Education course (PGCE) at the University of Ulster.

Integrating e-learning and problem-based learning pedagogy

The design for the teaching programme is based around the belief that learning is a social process and therefore elements of human interaction were considered essential to its structure so as to maintain the synergy that face-to-face contact can create. The programme was developed to facilitate the integration of a problem-based and online (e-)learning approach, both of which support a constructivist theory of learning by incorporating structured discussion, group work and an emphasis on 'interpreting concepts in the light of one's own experience' (Weller, 2002, p. 65). Asynchronous and synchronous discussions were used to complement face-to-face work and also to facilitate opportunities for personal reflection through professional dialogue. Problem-based learning activities were designed to encourage collaboration and creativity within an environment of collegiality. Learners do not learn in isolation and the pedagogical approach was to provide activities that would help participants to construct and integrate new learning with prior learning and experience.

E-learning pedagogy through the use of WebCT provided the structural 'engine' for the programme. Candy (2000) describes four categories for successful lifelong learning that have been 'significantly strengthened by the spread of the internet' (p. 110). These are: workplace-based learning; continuing professional education; further formal study; and self directed learning, all of which are essential components within of pre-service education. While the use of e-learning for programme delivery in a range of fields has increased dramatically in recent years, it remains a contentious pedagogical approach.

Underwood (2004), for example, cites the failure of the Information Communication Technology (ICT) educational community to make contact with the central body of educational research, and to use integrative language and theoretical perspectives across disciplines. Gardner and Galanouli (2004) suggest that much ICT research shows a lack of theoretical advance, and query the anecdotal assumptions that computer technology has in itself a motivational effect that encourages higher learning. Mayes and de Freitas (2004) go so far as to suggest that there are actually no distinctive models of e-learning and that using ICT is simply an enhancement of traditional, mainstream pedagogy.

In face of such criticism, however, there has also been considerable research about the potential advantages that e-learning can bring to teaching and learning and in particular the capacity of computer conferencing to provide a forum for shared reflection on professional practice. There is a growing body of research on the instructional benefits of asynchronous communication (Bodzin & Park, 2000; Lambe & Clarke, 2003) and it has been shown to promote reflective thinking and

encourage debate (Austin, 1997; Galanouli & Collins, 2000). Lambe and Clarke (2003), for example, conclude that online conferencing can offer opportunities to foster 'high quality professional dialogue' (p.361) when used early to support student teachers in ITE programmes. There is also the potential to use online discussions for informal, emergent forms of learning, and for the development of embryonic communities of practice (Clarke, 2002).

An important common aim of programmes that prepare teachers is to promote the development of critical and reflective thinking skills by providing opportunities for student engagement, through collaboration and social negotiation, in meaningful discourse (defined by Duffy & Cunningham, 1996) in terms of allowing the sharing of different viewpoints and ideas and the collaboration on problem solving and knowledge building activities. When learners are engaged in collaboration and social negotiation they are able to articulate what they know by explaining it to others, and reflecting on what they know by analysing their performance and comparing it with that of experts and peers (Collins, 1991, cited in Gilbert & Dabbagh, 2005). Such articulation and reflection can provide 'support for knowledge construction by allowing students to relate course content to prior knowledge and experience and interpret content through the analysis, synthesis and evaluations of others' understanding' (Gilbert & Daggagh, 2005, p. 6). Jonassen et al. (1995) describe how 'knowledge construction occurs when students explore issues, take positions, discuss those positions in an argumentative format and reflect on and re-evaluate their positions' (p. 16). Furthermore, articulation and reflection can allow students to make inferences by generalising their understanding and knowledge so that it is applicable in different contexts (Collins, 1991).

Online, or e-learning (terms that are often used interchangeably), can be used as an effective means to encourage articulation, reflection and social negotiation particularly when on school-based practice. Students on school-based practice would certainly represent one of Gunawardena *et al.*'s groups (1997) 'that are separated in time and space' that require e-learning approaches to enable them to 'engage in the active production of shared knowledge' (p.410). One of the most important benefits of such communication is also its potential to support the co-construction of knowledge through discourse. Tiene (2000) found that students responded positively to the asynchronous aspect of online discussion because 'it allowed them to participate at their own convenience when they had the time to read the comment and the time to develop their own responses', and 'there was also time to think about the point made by their peers and time to decide how they felt about certain issues' (p.382).

By exploring the potential of using a blended learning approach this research attempts to extract the appropriate aspects of each pedagogy and so establish an enhanced and effective learning environment for participants. This might be described as a 50/50 model where the online work occupies half of the allotted programme time and the course content occupies the rest. A blended programme also necessitates the use of a strong resource base so as to allow for increased independent learning opportunities with the tutor visible as facilitator.

Initial teacher education in Northern Ireland

The Post Graduate Certificate in Education year is a short and intensive one and student teachers spend only 12 weeks in a discretely university setting. Considering the time restrictions there is a constant need to ensure that time available is effectively used to prepare the student teacher for working within an increasingly inclusive teaching and learning environment. The elective described here was a pilot supported as part of a Classroom 2000 (C2K) initiative which is Northern Ireland education's own managed learning system (<http://www.c2kni.org.uk/>).

Using a VLE is a familiar experience for student teachers at the University of Ulster as it is used regularly for various activities within their individual subject areas and as a support and communication mechanism when on long teaching practice blocks. It allows participants to communicate or 'chat' in open or restricted groups, using live and threaded discussion facilities. Course materials, including selected readings, group activities and assignments are posted onto the site by the tutor who acts as programme facilitator.

The SEN and inclusion programme was developed to last for the 12 weeks the students spent in the university setting and across both nine-week school-based placements, with approximately three hours each week allotted to the work of the programme when in the university. It utilised a website specifically designed by the School of Education to provide an information base to support learning on SEN and inclusion. The development of this site was funded by a cross border initiative through the Standing Conference of Teacher Education North and South (SCOTENS). It is an open site and is specifically designed to support those in pre-service education (it can be accessed at: <http://www.scotens.org>).

Creating interactive activities

Social negotiation and collaboration were important elements of the programme. It was designed so as to facilitate knowledge building as well as collaborative and problem-based learning activities during the time spent in the university and on into school-based experience. It also provided a forum for student teachers to reflect critically upon their observations and practical learning experiences while teaching. In this context problem-based learning aimed to provide 'real world problems' (Duch *et al.*, 2001, p.6) tailored specifically to the learning needs of a student teacher in the area of inclusion and SEN.

While in the university the student group completed a wide range of activities to prepare them for their first teaching practice in a non selective school. An adaptation of Laurillard's Conversational Model (1993) influenced the design of the e-learning activities by offering integrated learning opportunities that aimed to be adaptive, interactive, discursive and reflective. Figure 1 shows how the Model was adapted for this programme and includes some examples of activities.

The full range of activities also included jigsaw learning to support extended reading, collaborative work including group presentations on their study of types of learning disabilities, teaching strategies based on case studies, differentiated learning

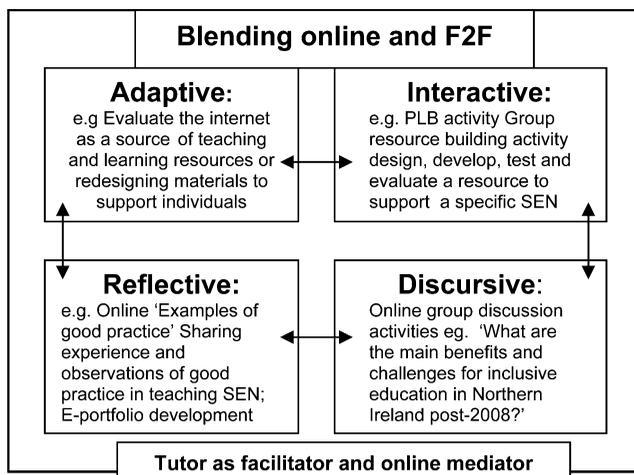


Figure 1. Adapting the conversational model for the SEN and inclusion programme

and classroom management issues. Participants were also able to pose questions to 'experts online' in addition to face-to-face seminars. These were professionals working to support pupils with SEN and included a teacher from a special school (a school for children with severe learning difficulties), an educational psychologist and a psychologist with experience in using applied behaviour analysis approaches in teaching children with autism. Discussion (both synchronous and asynchronous) based on set readings and analysis of key texts was also used to encourage professional dialogue. This was an important scaffold on which the online aspect of the programme was built. These discussions were developed further during teaching practice and assignments were also designed as collaborative resource building activities. A full outline of the programme structure and content is available from the author.

Research questions and methodology

This study evaluates the potential of using a problem-based learning approach within a blended e-learning programme to prepare student teachers for inclusive classroom teaching. There were two stages to the evaluation process which followed a strategy of integrating a number of data collection and analysis methods as recommended by Draper *et al.* (1996). The first stage took place during the final week of the university-based aspect of the programme (prior to the second teaching practice experience), when a questionnaire was administered to the course participants ($n=41$). Completion of the questionnaire was voluntary and of the 41 surveys administered all 41 were completed and returned, representing a return rate of 100%. The survey contained 18 statements exploring student perceptions of the programme, specifically the following:

1. blended, problem-based learning as an effective means of programme delivery;

2. readiness for teach SEN in an inclusive setting on completion of the PGCE programme.

An online asynchronous discussion forum was also established during teaching practice. This gave the cohort the opportunity to articulate their thoughts and perceptions about the programme in context, and in a more considered and reflective manner enabling 'thick description' (Geertz, 1973). It also allowed the researcher to qualitatively explore and clarify the themes emerging from the questionnaire. Participants were asked to articulate the extent to which and in what ways they felt the programme had fulfilled their expectations. Using the VLE had the added benefit of allowing the discussion to be archived and the transcripts were then reviewed by both the participants and researcher as part of the analysis process so as to ensure the reliability and validity of themes. The analysis followed a qualitative approach. Key themes or common threads were identified by reading and re-reading the archived discussion. Specific phrases or sentences used regularly by the students within the discussions were used to aid the selection of category headings relevant to the focus of the research. A short coding system was established: (1) relating new knowledge to prior knowledge, (2) interpreting content through the analysis, synthesis and evaluation of others' understanding, and (3) making inferences. The students' own words expressed within the discussions are used to illustrate each category heading and add support to the findings.

Findings

Results of the questionnaire

The results of the questionnaire indicated a consistency amongst the participants as to their confidence in blended problem-based learning. All the respondents believed that the teaching provision for SEN and inclusion was effectively delivered using a blended learning approach.

With regards to technical issues, 98.3% found the VLE (WebCT) easy to navigate with 95.1% in agreement that they felt quickly at ease within the online environment. A large majority of respondents (98.3%) felt that group collaboration and problem-based activities were important features of the programme effectiveness. No student claimed to feel uncomfortable in online discussion situations and there appeared no sense of anxiety about speaking frankly about opinions or attitudes. Importantly, when asked 92.8% of respondents agreed that using of the blended programme could provide an important tool for delivering the PGCE programmes successfully, therefore suggesting possibilities beyond the context of SEN and inclusion. Responses also suggested that the regular use of the VLE had actually improved their confidence and competence in using ICT generally. At the start of the PGCE year 23% of the cohort felt they did not have good ICT skills. At the end of the programme 86.9% of those surveyed felt that their ICT skills had improved as a direct result of using the VLE as part of the elective programme. Figures 2, 3 and 4 present the results of the questionnaire in graph form.

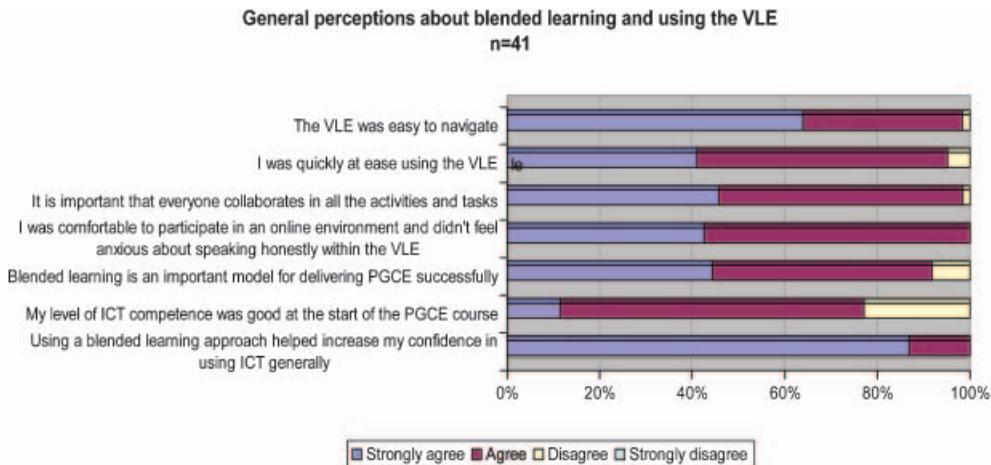


Figure 2. Perceptions about using the VLE

The survey also revealed that 62.3% of the student group had been concerned about their ability to teach in an inclusive classroom prior to beginning the PGCE. By the end of the PGCE programme 90.2% of respondents felt they were now well prepared. The same number of respondents however, felt that even more time should have been allotted to issues surrounding SEN and inclusion during the PGCE year while 81.9% of respondents believed that other (unnamed) aspects of the programme should have been reduced to facilitate this.

The survey revealed that on completion of the programme the cohort felt increased confidence about managing pupils with SEN within their classroom,

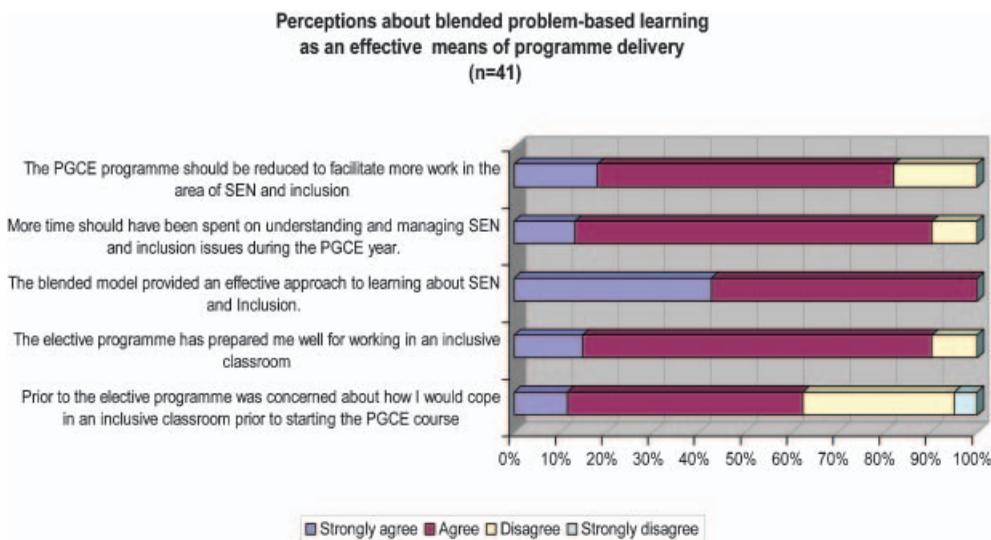


Figure 3. Perceptions about blended, problem-based learning as an effective means of programme delivery

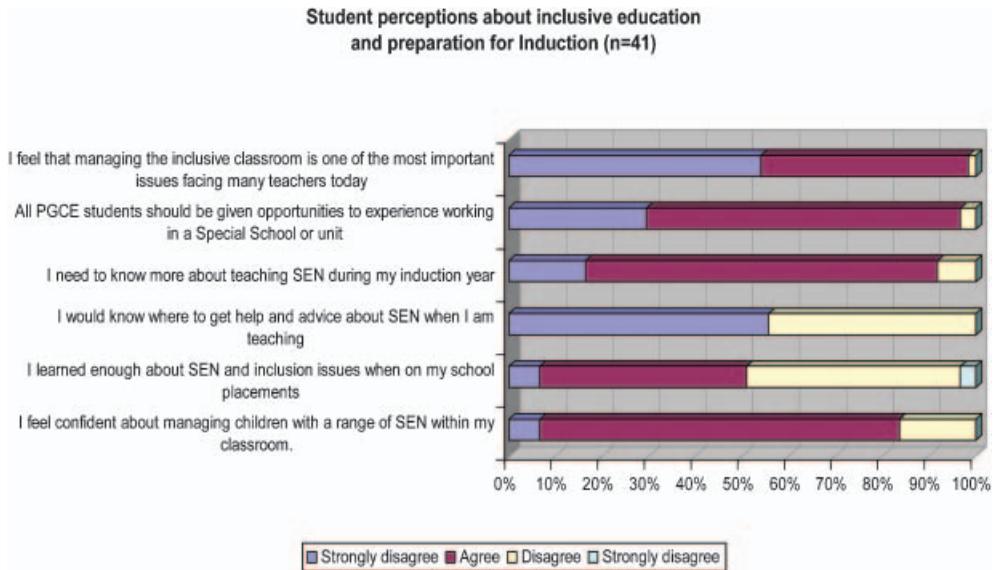


Figure 4. Student perceptions about inclusive education and preparation for induction

though 91.8% still felt they would still require continued support during induction. Just over half (50.9%) felt that teaching practice had given them sufficient knowledge about SEN and inclusion at this stage though a significant majority (86.9%) felt confident as to where to go for help and advice during the induction year. Almost all the respondents (98.4%) believed that managing an inclusive classroom was currently one of the most important and challenging issues facing teachers. The majority of respondents also expressed the belief that student teachers should be given the opportunity to experience teaching in a special school as part of their training programme.

Results of the online discussion

The final asynchronous discussion was conducted during the last week of the cohort's second teaching practice. They were asked to consider the pedagogical approach to the programme, how it was designed and delivered and the extent to which this had fulfilled their learning expectations. Analysis of the questionnaire had shown positive attitudes towards key features within the programme. These findings were identified again by the students within the discussion. In addition to these, the role of the tutor as facilitator was also identified as having an important influence on the effectiveness of the programme delivery.

The main findings are detailed separately and a selection of the participants own words are used to illustrate each.

- Collaborative and group learning activities (problem-based learning activities).
- Developing knowledge and understanding of the diverse needs of pupils with a range of SEN.

- Activities relating to strategies for teaching and learning in a SEN context.
- Guest speakers (face-to-face) and being able to question experts online.
- Online discussions. Being able to complete activities and contribute to discussions ‘anytime’ ‘anywhere’.
- Role of the tutor.

Collaborative and group learning (adaptive–interactive–discursive–reflective activities). In a blended, problem-based approach, an authentic problem is presented with the aim of encouraging the students to identify concepts and research principles both online and face-to-face. It is important that the ‘problem’ is appropriate to the learning needs of the participants and that it should ignite in them a curiosity to research and increase their knowledge and understanding. The problems set were often based around collaborative resource building activities. These required the students to research specified conditions using sample case studies and/or Educational Plans with the aim of creating, testing and evaluating resources in an authentic setting (teaching practice). Some were subject specific while others supported generic needs. The majority of postings identified this as an important mode of learning within the programme, with an example being as follows:

I think the best bits of the course were the group activities. That really got me out of my comfort zone for a start because I had to work with others who were not from my own subject area. That alone and all the different personalities was a bit of a culture shock to start with. At the same time it meant that we started to see ourselves as a sort of staffroom group and not just subject teachers. When producing resources we all had different strengths and were able to see things from a range of perspectives—very frustrating sometimes for someone like me whose subject is art and design. During my undergraduate degree working collaboratively was a no-no. We were all too busy competing against each other.

Developing knowledge and understanding (adaptive activities). Those in pre-service are at the earliest stages of their professional learning and it was important that knowledge building underpinned the activities. The website designed to support the programme provided a valuable resource base for learning as its content had been tailored specifically for the needs of the course participants who were at the first stages of teacher education.

Learning experiences were designed that required the cohort to explore and critique the content of the website (and other available online resources) so as to build knowledge and understanding on an individual, paired or group basis (as seen in Weeks 2 and 3). The website was seen as an invaluable resource:

There was a lot packed into a short time but the way the course was designed helped a lot. I felt as if we were always working in a team rather than on our own. It meant that we seemed to cover a lot of ground. When I went on teaching practice I was able to call on the website and the resources we had made to help. It was also great to be able to talk with everyone in the discussion areas. I suppose you could say that we shared all our experiences and learned a lot that way.

The website was a brilliant resource. It might have been designed for student teachers but I will still use it when I'm finished the PGCE course. Everything you need to help is there.

Strategies for teaching and learning in a SEN context (adaptive–discursive–reflective activities). SEN and inclusion is viewed as an 'agenda' that reflects fundamentals of an equitable and just society. This thinking reflects a shift in the inclusion debate from concerns with supporting the rights of learners with impairments (the context of disability) to a focus on all learners who are vulnerable to exclusion and to exclusionary pressures within society. It places the emphasis away from the assessment, categorisation and educational placement of learners according to their disabilities towards an engagement with how a system can be responsive to educational difficulties. The concern is not only with a small group of learners categorised as 'disabled' but an engagement with a wider group of students who are vulnerable to learning breakdown. Essentially, however, it should also be a fundamental right that every learner receives a good and appropriate education that best fulfils their needs, in the environment with skilled practitioners.

An important aspect of the programme was to ensure that the student cohort had opportunities to familiarise themselves with a diverse range of SEN conditions. This included an exploration of classroom management issues and potential strategies for effective teaching within an inclusive classroom. These activities were initiated during the time spent in university and then integrated into teaching practice which provided an authentic setting for learning (weeks 3 and 8) and the integrative nature of the programme was identified as a strength:

I think I have quite a bank of strategies under my belt now. While in the university I suppose you could say I worked on all the theory side of things but and then I was able to try them out while on practice. It wasn't always easy and they didn't always work as well as I expected but I found that they did give me a starting point. I think in the end that's all you can really hope for ... you have to find your own way of making things work for you. Every child with an SEN is different and it can't be a 'one shoe fits all' approach anyway.

Guest speakers and experts online and face-to-face (interactive–discursive activities). The use of guest speakers whose expertise supported the programme was also identified by the students as a valuable aspect of the teaching and learning environment. Access to experts 'online' provided an innovative extension to these visits by offering the students a period of reflection and time to pose more informed questions or ask for advice, something that was clearly appreciated:

I thought that one of the best aspects of the course were some of the speakers. To actually talk to those who are experts in the field was extremely helpful. They were all very good and always tried to offer practical help and support as well. I think it was important that they were face-to-face with us. I don't think it would have had such an impact if they were on a video or something. It was also great to be able to actually ask questions after they were gone. Sometimes your mind goes a blank when on the spot or just you don't like to ask something in case it sounds stupid and then the online questions give you another chance. It's also easier to take in when answers are written.

The speakers were great. I really enjoyed the chance to hear about how Applied Behaviour Analysis is being used with Autistic children. I'd heard about it but had no idea what it was about. It was so interesting and then when I went on teaching practice there was a boy in my school who is on an ABA programme and I was able to talk about it to the teacher and his classroom assistant.

Online discussions (discursive–reflective activities). The students identified the online discussions as a key aspect of programme design. They were used in a number of ways. Initially as an opportunity for participants across subject areas to get to know each other, as well as a forum in which to share and reflect on individual experiences and observations.

As the programme progressed the complexity of activities supported by the online discussions increased. Throughout these discussions the participants were asked to describe activities or experiences and provide analysis and explanation of the teaching and learning process. Importantly they were also expected to show evidence of reflection by identifying some element of personal meaning or significance. They were also expected to make judgments based on research activities and knowledge gained through the range of activities provided by the programme.

The online discussions facilitated a variety of collaborative learning activities and also supported the question and answer sessions with a range of experts. One further benefit identified was in helping to reduce the sense of peer isolation that student teachers can often experience when on teaching practice.

The discussions were really good, especially when on teaching practice when it's easy to feel a bit lonely and sometimes you've had a bad day. There was always somebody from the group who was in the same boat and everyone was very generous with ideas or resources that would help. It was a bit of a lifeline sometimes.

The role of the tutor. There were two ways in which the role of the tutor was also identified as a key factor in the successful delivery of the elective. Visibility early in the programme was seen as essential to ensure that all the participants understood the importance of contributing regularly. The online tutor was seen at this point as having an important role in 'policing' the programme.

Especially at the start it was very important for X (the tutor) to contribute to the discussions. I think if she hadn't been visible on a regular basis maybe people wouldn't have been online just as much ... especially when on teaching practice when it was easy to forget or just not be bothered.

As the programme progressed the tutor role was extended to one of discussion facilitator and even occasionally playing the role of 'agent provocateur'.

Some of the discussions were quite heated. Once we got to know each other we were less polite! It helped of course that we knew each other in a face-to-face way as well. We are all as a group quite different with different ideas. Some of the group were very pro-inclusion and some weren't. It wasn't long before there was a good old debate going about the rights and wrongs of each. X (the tutor) would come in just when you least expected and say something provocative and that would start it all off again. It was always very good natured of course but no one was afraid to say what they thought.

Discussion

Concern about improving support of learners with diverse SEN has increased with the drive towards adapting more inclusive practices in mainstream schools. While research has concurred as to the importance of teacher attitudes in ensuring successful inclusion (Ward *et al.*, 1994; Bender *et al.*, 1995; Avradimis *et al.*, 2000a) much has also been made of other important variables effecting teacher perceptions of efficacy and the influence this may exert on attitudes. More than 20 years ago Blair (1983) was recommending a more aggressive approach towards training while Beare (1985) concluded that a more effective strategy was needed to improve provision at the pre-service stage. Improving training is also consistently identified as important to raising efficacy and developing positive attitudes (Avradimis *et al.*, 2000b; Lambe & Bones, 2006a).

There appears, however, to be less research exploring the potential that innovative pedagogical models may have to support learning particularly in short one-year post-graduate ITE programmes. SEN content that is diffused or permeated across taught elements of ITE has been criticised for lacking focus or for having questionable quality (Davies & Garner, 1997; Mittler, 2000). Content driven programmes have also come in for criticism for imparting facts rather than confronting attitudes and values (Hastings *et al.*, 1996). To share the common challenges of inclusive education there may be a need to move away from what we presently see as separate but parallel training towards a more integrative and collaborative training model where educators from diverse disciplines will work closely together within the training institutions and within the schools (Muthukrishna, 2000; Slee, 2001).

This study offers some insight into the potential that blending e-learning pedagogy with other approaches can offer initial teacher education in supporting SEN and inclusion studies. While the small size of the study means that any generalisation may be tentative those completing PGCE at the University of Ulster do represent almost half of all post-primary student teachers in Northern Ireland and the findings of this study may therefore help to inform any rationalisation that may be required in preparation for a changing educational environment.

Student teachers taking part in the study in Northern Ireland clearly believe that inclusive education and provision for pupils with SEN is one of the most important issues facing all teachers and so exploring ways of offering effective training provision is essential (Lambe & Bones, 2006b). As Northern Ireland has also invested heavily in the development of a comprehensive e-learning strategy at all levels of education (DE, Northern Ireland, 2004b), there is an onus now to use it effectively to enhance teaching and learning approaches within ITE.

The majority of students who participated in the programme identified a problem-based, blended approach as a positive experience that enhanced their overall learning experience in the area of SEN and inclusion. The key benefits of this approach were cited as opportunities for collaborative activities, developing strategies for teaching and learning, and opportunities to interview experts online as well as face-to-face speakers. Students also felt that the opportunities it offered to complete set activities (including discussions) without the restrictions of a traditional

classroom setting was a positive aspect of the programme design. The development and use of the web resource was also cited as one of the most positive supporting scaffolds of the programme.

One concern about working online was that students might be anxious about committing their thoughts to text, especially in an open forum. They were also aware that their words are archived and this might have the affect of inhibiting frank discussion. It was therefore pleasing to note no student seemed to feel inhibited about contributing frankly to live or threaded discussions and the dialogue maintained a professional tone throughout.

A significant majority (90%) felt that more time should be given to special educational needs and inclusion within the overall PGCE programme and that other areas should be reduced to facilitate this. They were, however, less forthcoming in suggesting areas that could be omitted from the present programme and so this may provide an area for further research.

Conclusion

While the majority of students claimed the programme had prepared them at this stage to support learners with diverse SEN in an inclusive setting, this must be seen only as the starting block in training provision. A significant number of respondents felt that further support and training was still needed during the induction period. The majority of respondents believed that all PGCE students should have the opportunity to complete a placement in a special school as part of their training. In response to this, opportunities have now been made available to those who request it.

The integration of three pedagogical approaches worked to build a strong programme. Because of its blended nature, occasional technical problems relating to infrastructure or hardware did not negatively influence programme delivery, and student motivation was sustained because of the importance placed on maintaining significant elements of face-to-face contact between tutor and peer group. Moreover, problem-based learning allows participants to work on real life problems relating in the context of this study, to a range of educational issues and tasks and these were used 'to motivate students to identify and research learning issues and to collectively communicate and integrate information' (Duch *et al.*, 2001, p. 6).

This study set out to explore the teaching and learning potential that integrating problem-based learning and e-learning pedagogy can offer student teachers in building their knowledge and competence for inclusive classrooms. This offers a research and development approach in so much as the findings may be used to inform and, where appropriate, modify practice. The continued need to improve pre-service provision will necessitate further re-evaluation and modification of current training methods together with the possible trialling of different pedagogical approaches. The testing of such approaches or initiatives through empirical research must be essential in seeking so as to identify the most appropriate teaching methods available for the training of effective and positive inclusive practitioners.

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