



Access and Participation in Science

Supporting Inclusion through Teacher Education (SITE) -a pilot initiative

IOP Institute of Physics
in Ireland



Action on Disability
EnableIreland



Acknowledgements

We would like to acknowledge and thank Patricia Harrington (Principal, School of the Divine Child, Cork), Mary Hanley (retired Principal, St. Caimin's Community School, Shannon) and Rita Duffy (Principal, Galway Community College) for their support for this project. We are grateful for the cooperation of pupils as well as their parents.

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Special Education Support Service (SESS) Mission Statement

'Through our work in supporting school personnel, we promote the acceptance of the individuality, potential and worth of every pupil with special educational needs. As a service that acknowledges and values difference, we work with schools to secure these principles and to provide high quality continuing professional development and support structures for teachers.

We are committed to combining a flexible and person-centred approach to the development of teachers' knowledge and skills with theoretical and practical perspectives so that pupils with special educational needs are enabled to reach their full potential and be included in the whole life of the school.'



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INTRODUCTION

The Special Education Support Service (SESS), under Teacher Education Section (TES) of the Department of Education and Science coordinates, develops and delivers a range of professional development initiatives and support structures for school personnel working with students with special educational needs in mainstream primary and post-primary schools, special schools and special classes (see www.sess.ie for further details).

In an era of increasing awareness of social inclusion and rapid scientific change, the aim of 'scientific literacy for all' has become a main objective of a general education. Science, reading and mathematics form the three literacy domains that are included in measures of educational achievement by the OECD (see www.pisa.oecd.org for more information on the Programme for International Student Assessment). Although few people could disagree with the goal of achieving scientific literacy for all students, taking the practical steps to implement a scientific education for students can be a complex and challenging task.

The importance of differentiating learning and teaching for all students is evident in current policy documents i.e. the post-primary guidelines on the inclusion of students with special educational needs (Department of Education and Science, 2007), departmental circulars and in the guiding principles of whole-school evaluation (Department of Education and Science, 2003) and individual

subject inspections (Department of Education and Science, 2004). Furthermore, the Code of Practice established by the Teaching Council (2007) places a responsibility on teachers to seek to engage with students in order to develop teaching strategies that are appropriate to their needs and that promote learning. The Code of Practice also requires teachers to establish classroom management strategies that support differentiated learning in a way that respects the dignity of all students.

The primary goal of this project was to develop a model of professional development that responded to teachers' needs within the context of inclusion in science learning and teaching. Several studies have highlighted the importance of teacher attitudes and resources in implementing inclusive educational practice (Waldron, 1997; Fox and Ysseldyke, 1997; Farrell, 2000). Teachers need opportunities to become familiar with classroom approaches, such as curriculum differentiation, cooperative learning and positive behaviour support that enable all pupils to engage more fully in the learning process.

Differentiation is a process by which teachers can enable all students to engage in the science curriculum by providing learning tasks and activities that are tailored to students' needs and abilities. There is good evidence to suggest that learning and teaching strategies, which include pupils with special educational needs benefit all pupils (Hobby and Smith, 2002; Corbett, 2001).

Teachers can differentiate the:

- content being learned by a student, e.g. some students might learn five functions while others learn three;
- process or way in which a student accesses material, e.g. by using the Internet, a computer programme or a textbook;
- outcome or way in which a student shows what he or she has learned, e.g. by writing a paragraph, drawing a diagram, recording a comment etc.

Teachers differentiate in response to a student's:

- readiness, skills and background knowledge;
- interests relevant to the content;
- learning profile, which includes how the student likes to learn (i.e. a visual, auditory, or kinaesthetic learner), the student's grouping preferences (i.e. individual, small group, or large group) and the student's preferences for space (e.g. a quiet space in the classroom).

Differentiating learning and teaching activities to meet the needs and abilities of students makes learning more personal and relevant. This personalized approach provides every student with opportunities to reach their potential, whatever their ability level, need or background.



Supporting Inclusion through Teacher Education (SITE)

Supovitz and Turner (2000) identify a number of elements essential for quality professional development programmes, including:

- enquiry, questioning and experimentation;
- sustained support;
- concrete teaching tasks based on teachers' experiences with pupils; and
- subject-matter knowledge.

Within a time-scale of four years, this project investigated pedagogical strategies for promoting inclusion in junior certificate science classrooms. The objective of this project was to identify concrete inclusive strategies, examine changes in classroom practice of individual teachers willing to initiate change and provide support for a wider cohort of teachers based on initial teachers' experiences. In the early stages of the project, teachers were encouraged to reflect on their experiences as a step towards developing new pedagogical insights (Schon, 1987) with regard to inclusion in science. Teachers were individually supported by the SESS to include pupils with special educational needs in the science classroom. Issues, challenges and solutions were considered by teachers within the context of their own teaching environment.

Two widely different teaching environments (School of the Divine Child, a special school for pupils who have a physical disability and Galway Community College, a co-educational community college) were provided with sustained support for science learning and teaching. To facilitate discussion and learning, teachers were provided with a **science resource pack** developed by the SESS through a reflective evidence-based project by the project leader while teaching junior certificate to mixed-ability classes that included pupils with special educational needs. The resulting science resource pack '*Science Differentiation in Action: Practical strategies for adapting learning and teaching in science for students with diverse needs and abilities*' was given to participating teachers who were encouraged to use evidence from their own teaching to adapt strategies from the resource pack (see Appendix A for the contents of the science resource pack).

This resource pack incorporates many of the criteria and strategies established by Booth *et al.* (2000), Heacox (2002) and Nind (2005) for creating inclusive curricula i.e. differentiation by building on student experience, reflecting differences in student knowledge, allowing for differences in learning styles, allowing students to learn in different ways and extending the learning of all students. The pack contains differentiated lesson plans and resources for the science classroom. Many of the lesson plans include interactive PowerPoint presentations, which can be used to review lessons quickly with pictures and instructionally sound feedback. Participating teachers reflected on their use of the resources in class and provided recommendations for alterations and additions to the resource pack. This resource pack was compiled by the SESS and distributed to every post-primary school in the country.

The science resource pack was also given to science teachers in St. Mary's School for Deaf Girls for use with an interactive white board. This visit resulted in a science teacher from the school contributing an article for the SESS newsletter *CABHAIR* (see Appendix B for the article).

The **instructional DVD** '*Differentiation in Action: Practical strategies for including students with special educational needs in the mainstream classroom*' outlines strategies for providing students with diverse needs and abilities with opportunities to participate meaningfully in activities in the science classroom (see Appendix C for a list of video clips). This DVD which was compiled with the support of pupils and teachers from St. Caimin's Community School in Shannon was distributed to every post-primary school and was used to facilitate discussion in face-to-face seminars.

The concept of **accessible experiments** became a central idea in early discussions between the project leader and Institute of Physics in Ireland (IOP) staff (see Appendix D for a detailed example of one of the accessible experiments, many of which have been adapted from www.scienceonstage.ie). A framework emerged to guide the choice of various experiments to be used during seminar delivery, which included the following features:

- 1) Readily available materials
- 2) Simple to construct and operate
- 3) Amenable to different learning outcomes
- 4) Fun and interesting

All three components developed in the earlier stages of the project (i.e. science resource pack, instructional DVD and accessible hands-on experiments) were combined, in collaboration with the IOP in Ireland, to form '*Science Differentiation in Action: An evening seminar for science teachers*'. This two hour **seminar** was developed to provide teachers with opportunities for discussion and the sharing of expertise. This seminar was piloted in three Education Centres (Blackrock, Drumcondra and Wexford) along the east coast of Ireland.

Impact on Teachers and Pupils

During all the phases of this project, teachers were provided with opportunities to voice concerns with regard to differentiation and inclusion.

'My main concern is that my results will go into decline and I've always prided myself on my students' results. Maybe that won't happen, maybe by changing my teaching methodologies I'll be back on track. It's hard to imagine though how students with reading ages of 7 to 10 years can be brought up to junior cert level.'

Experienced Teacher

Collaborative teaching enables teachers to combine their resources to create solutions over time (Idol, Nevin & Paolucci-Whitcomb, 1994). Views expressed during the initial piloting of the science resource pack and during the evening seminars showed that teachers felt that they had little time to create resources of their own to meet the diverse needs of pupils in their classrooms.

'Great to be going away with some practical things that can be used. This is an area I'm really keen to get better at but I find my time is really limited. I can only develop a small amount of new resources. I would come to an evening where I made a set of cards/PowerPoint's – I have good intentions but need help to get things done.'

Newly Qualified Teacher



Schools can build on the experience, skills and knowledge of their teachers to meet the diverse needs of their pupils by encouraging and developing opportunities for communication and collaboration amongst colleagues (Reynolds, 2001). Teachers' collaboration during the course of this project resulted in increased inclusion for targeted pupils.

'We are delighted to let you know that one of our students, Edward achieved an A in science in the junior certificate examination. We are all very pleased with his result given that he only took up the course two years ago. As you know our school does not have a science lab and for the past two years we have used the lab in Bishopstown Community School. Your input has been invaluable and it was this approach that contributed to Edward's success.'

Principal & Mid-career Teacher (Joint contribution)

Teachers are a key factor towards building inclusive schools but the process of inclusion cannot be fulfilled through teachers alone. Inclusion concerns the culture, policy and practice of the school and must involve all stakeholders including the pupils themselves.

'Mary's special needs assistant came to me today to say the change in Mary yesterday was fantastic after the lesson. She was much more confident even in the classes that followed.'

Experienced Teacher

'I like the whiteboard because it is colourful and the images or animations help me to remember the lesson more.'

Deaf Student

'I like using concept maps. The shapes help me to remember.'

Student with Dyslexia

'I asked them how in their opinions we could improve their learning experiences. In general they felt they should get more homework but they wanted to be helped with it.'

Experienced Teacher

"I have tried praise and encouragement instead of giving out or anything negative in the class. It has worked as students attendance has improved as well as their behaviour in class. Also on the corridor they always say 'hello miss' and I to them even if we have had a falling out in class. I now get the class working earlier, on average only two out of fourteen will be without pens so I always make sure I have some spare. I find it's a huge improvement since September."

Newly Qualified Teacher

Differentiation not only attempts to include all students in the learning process but it also has the power to transform learning and teaching for the teacher. As teachers became more comfortable with the concept of differentiation and witnessed firsthand the many benefits that differentiation provides for their students, teachers' own professional knowledge, skills and practice were enhanced.

"The new strategies have benefited me in that I feel as if I'm reaching out to more students in my classes and I'm more satisfied with my work personally. I know the students are enjoying the classes more from the feedback they give me and that makes me happier.....It's like a breath of fresh air. Obviously we all know our facts for our respective subjects but there is always room for improvement in the way we deliver such facts. I think I'm actually nicer this year in that I'm more in tune with the individuals within my classes. My students are definitely enjoying science more and are achieving higher grades."

Experienced Teacher

During the pilot seminars, eighty science teachers were provided with a list (see Appendix E) and asked to indicate five areas that they would prioritise with regard to including pupils with special educational needs (The number of hits by each teacher is indicated in brackets).

- Participation (49)
- Inclusive Teaching Strategies (41)
- Resources (36)
- Raising Achievement (34)
- Experiments/Investigations (31)
- Progress (24)
- Safety (24)
- Planning (22)
- Special Educational Needs (14)
- Assessment (13)
- Behaviour (13)
- ICT (11)
- Professional Development (9)
- Disability Awareness (9)
- Diversity (8)
- Right to Education (6)
- Expectations (8)
- JC Examination (4)
- Policy (2)
- Textbooks (2)
- Access (3)
- Whole-school Approach (3)

It is clear that science teachers value inclusive teaching strategies that emphasise participation along with resources and support for experiments and for raising achievement. These approaches were emphasised in the science resource pack, instructional DVD and demonstrations of accessible experiments. The importance of these concepts in meeting teachers' needs was also borne out by teachers' evaluations of the evening seminar.

Over ninety percent rated both the content and the presentation of the evening seminars as excellent. Furthermore, teachers' comments provided added support for such an approach to CPD (see Appendix F).

'PowerPoint presentations are excellent with understandable language and down to the point. The kids love the quizzes on the topics. Thanks.'

'Far more interesting attending when material is practical and can actually help in the class room. Experiments can be used and the explanation about what is happening is excellent. This is what in-service should be all about.'

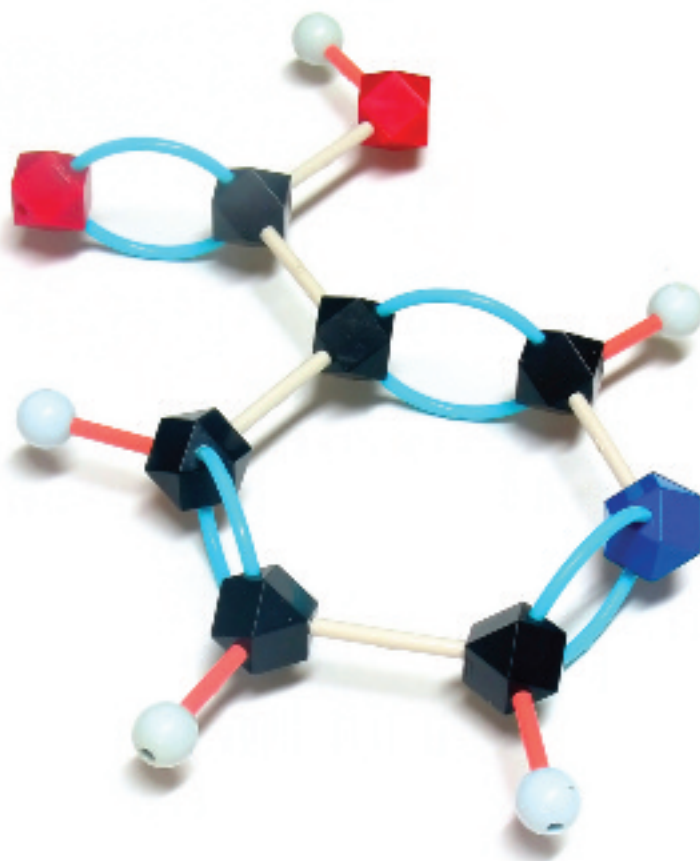
'The Science Differentiation in Action book/CD is terrific – used it with first years last year.... Thank you.'

Teacher Evaluations

Conclusions

Teachers value CPD that emphasise inclusive teaching strategies and participation. They value opportunities to share how they can meet the diverse needs of their pupils more effectively through evidence-based practice and differentiation.

It is important to note that differentiation is an ever-evolving process that depends not only on students but also on teachers. The greatest skills that teachers need are flexibility and open-mindedness so that they can develop their competence and confidence to meet students' needs. Differentiation is not just about facilitating different curriculum content, learning styles and student work, but more importantly, it is about valuing each student by establishing a classroom and school environment where everybody belongs.



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Appendices

Appendix A – Science Differentiation in Action Resource Pack

Appendix B – Interactive Whiteboard

Appendix C – Science Differentiation in Action DVD

Appendix D – Example of an Accessible Experiment

Appendix E – Inclusion Issues

Appendix F – Summary Evaluations from Pilot Seminars

Appendix A: Contents of Science Resource Pack

Section 1: Introduction

Section 2: Lesson Plans

- 2.1 Safety
- 2.2 Balanced Diet
- 2.3 Digestive System
- 2.4 Respiration
- 2.5 Living Things
- 2.6 Cells
- 2.7 States of Matter
- 2.8 Elements
- 2.9 Mixtures and Compounds
- 2.10 Air
- 2.11 Acids and Bases
- 2.12 Atoms
- 2.13 Measurement
- 2.14 Forces
- 2.15 Pressure
- 2.16 Energy
- 2.17 Heat
- 2.18 Light
- 2.19 Revision

Section 3: Worksheets

- 3.1 Safety
- 3.2 Balanced Diet
- 3.3 Digestive System
- 3.4 Respiration
- 3.5 Living Things
- 3.6 Cells
- 3.7 States of Matter
- 3.8 Elements
- 3.9 Mixtures and Compounds
- 3.10 Air
- 3.11 Acids and Bases
- 3.12 Atoms
- 3.13 Measurement
- 3.14 Forces
- 3.15 Pressure
- 3.16 Energy
- 3.17 Heat
- 3.18 Light

Section 4: Classroom Activities

- 4.1 What I Like Doing
- 4.2 Definition Game
- 4.3 Football Fever
- 4.4 Collaborative Group Activity
- 4.5 Keyword Game
- 4.6 Ranking Game
- 4.7 What am I?

Section 5: Toolkit

- 5.1 Differentiation in Action
- 5.2 Strategies to Support Students with Special Educational Needs in the Mainstream Classroom
- 5.3 Readability
- 5.4 Helping Students with Reading
- 5.5 Levels of Thinking
- 5.6 Solving Word Problems in Science and Maths
- 5.7 Ways of Learning
- 5.8 Assessment
- 5.9 Classroom Climate
- 5.10 Lesson Evaluation
- 5.11 Graphic Organisers
- 5.12 How Differentiated is my Teaching?

Section 6: Experiments

- 6.1 Safety Contract
- 6.2 How to Differentiation Experiments and Investigations
- 6.3 Experiment Write-up Template A
- 6.4 Experiment Write-up Template B
- 6.5 Experiment Write-up Template C
- 6.6 Experiment Write-up Template D
- 6.7 Inflating Balloon Activity

Section 7: Appendix

- 7.1 Lesson Template
- 7.2 Science Differentiation in Action Feedback Form

Appendix B: SESS Newsletter (CABHAIR) Contribution

Interactive Whiteboards: A Quiet Revolution in the Classroom

In St. Mary's School for Deaf Girls we have been using an interactive whiteboard (IWB) for the past year. We got our IWB when we joined the CBI project (Cláir Bhána Idirgníomhacha www.cbiproject.net). This was set up to evaluate the use of whiteboards in education in Ireland and to produce resources that could be shared. We became involved in the project through our local ICT Advisor, David Kearney. We have two teachers involved in the project at the moment – Liz Mc Lafferty, teaching Science to Junior Certificate and Margaret Owens teaching, Mathematics to Junior Certificate.

An IWB is a large, touch-sensitive screen that connects to a digital projector and a computer using SMART Notebook software. It displays the information on the computer screen for the whole class to see. The information is saved in files using this software so it can be retrieved easily in the future. The material is easy to adapt according to the needs of different student groups, or individuals.

The IWB was installed in the Science room. All the science teachers were “thrown in at the deep end” and had to learn how to use this new technology very quickly as the blackboard was removed. The science teachers have shared the files they have created for the classroom with each other which has led to a large bank of science resources being available.

Initially, we were a little daunted by the new technology. However, after a few weeks of training, the IWB has become an integral part of our teaching. While the preparation work can be time-consuming the benefits are significant.

With an internet connection on the computer, a huge bank of interactive, on-line resources, suited to use with the IWB have become available. Every lesson we prepare has some level, be it small or more comprehensive, of interactivity built in (through touching and manipulating text or graphics). The variety of resources and activities are impressive. These include online multiple-choice quizzes, downloaded video clips, labelling the diagram exercises etc. This more interactive style of learning has been embraced enthusiastically by the students and has enhanced their learning experience.

In practical terms, the IWB allows one to hold the attention of all students at the same time. When textbooks or worksheets are used in teaching deaf students they have to look down to read the text and it is very time consuming to get the attention of the students again. The IWB greatly reduces this problem. We can read information from the board and sign at the same time. This increases the opportunities for communication between teachers and students.

The lessons flow at a much faster rate as the teacher can move back and forth through the pre-prepared pages with the touch of a finger. The students no longer spend time writing notes from the board in class. The teacher can print the information together with relevant annotations and give the printouts to the students to study at home.

The IWB is of great benefit to our students. Being connected to a computer and the internet, the lesson becomes more interesting, more interactive and more visually stimulating. The variety and quality of visual material available is of particular relevance to deaf students. Abstract concepts in Mathematics and Science can be made more accessible through the use of the 3D graphics and modelling. These facilities offer such an improvement in the classroom that we could not do without them now.

Greater participation in the lesson has many benefits. In particular, we notice that the students have become more confident in class and are much quicker to volunteer answers to questions.

Student feedback has been very positive:

"I like the whiteboard because it is colourful and the images or animations help me to remember the lesson more."

"It is more enjoyable to learn using the interactive whiteboard."

"The hyperlinks help me to get a clearer understanding about the topic."

Three new interactive whiteboards have since been funded by the Department of Education and Science (DES). These have now been installed and we look forward to using them across all subjects in the coming year. In addition, the teachers in St. Mary's organised a race night earlier this year to fundraise for the purchase of more IWBs. Teachers from all subject areas have become excited by the possibilities these boards offer. There is a quite revolution afoot in the classroom in St. Mary's.

Liz Mc Lafferty

St. Mary's School for Deaf Girls, Cabra, Dublin 7.

Appendix C: Differentiation in Action DVD

The DVD includes seven video clips that demonstrate practical strategies for including students with special educational needs in the mainstream classroom.

Topics covered include:

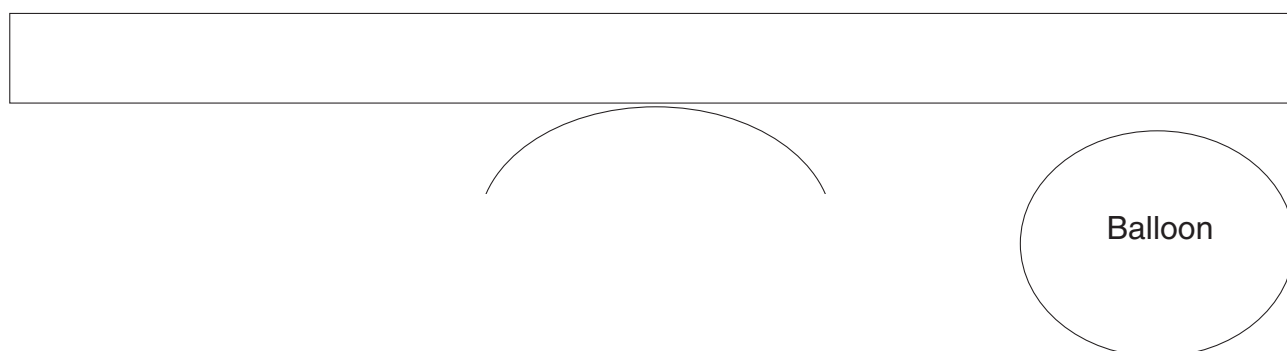
1. Learning preferences
2. Readability
3. Co-operative learning
4. Paired learning
5. Active learning
6. Concept mapping
7. Information and Communication Technology (ICT)

Appendix D: Example of an Accessible Experiment

Demonstrating Electrostatic Attraction

Materials: Inflated balloon, clock-glass, wool sweater, metre stick

Diagram:



Method:

Balance a meter stick on its edge with the 50cm mark in contact with a clock-glass as shown. Rub an inflated balloon against some wool, thereby imparting a charge to it by friction. Bring the balloon close to one end of the meter-stick. When there is a gap of only a few centimetres between the broad-side of the meter-stick and the balloon, gently try to increase the separation between the balloon and the meter-stick.

It will be found that the meter-stick begins to rotate in a horizontal plane, apparently attracted by the balloon. Now place the balloon on the opposite side and try to draw the meter-stick back to its starting point

Possible Differentiation of Learning Outcomes

Must Know: Objects (e.g. balloon) may acquire a charge by friction.

Other objects (e.g. meter-stick) may become attracted by a charged object in its vicinity.

Attraction occurs between objects that have opposite charges.

Should Know: Positive and negative charges are evenly distributed in general, but the charges on the meter-stick rearrange themselves when the charged balloon is nearby.

This rearrangement results in a gathering of "opposite" charge on the broadside of the meter-stick that faces the balloon.

Could Know: If the balloon is held close to, but not in contact with the meter-stick, the attraction between them, causes the stick to rotate as the balloon moves away.

If the balloon is taken away completely, the charges on the meter-stick redistribute evenly as at first and the meter-stick stays at rest.

Appendix E: Inclusion Issues

Inclusion in Science

Please tick 10 items that are the most relevant to your teaching.

1. Access
2. Participation
3. Progress
4. Assessment
5. Safety
6. Diversity
7. Collaboration with Colleagues
8. Special Educational Needs
9. Policy
10. Collaboration with Parents
11. Raising Achievement
12. Professional Development
13. Right to Education
14. Behaviour
15. Whole-school Approach
16. Resources
17. Planning
18. Experiments/Investigations
19. JC Examination
20. Textbooks
21. Removing Barriers
22. Expectations
23. ICT
24. Inclusive Teaching Strategies
25. Disability Awareness

Priorities

From the list of ten items that you ticked on the left, please list 5 items that you would prioritise with regard to including pupils with special educational needs.

1.
2.
3.
4.
5.

Name:

No. of years teaching:

Interested in undertaking an action research/reflective project on your own teaching

.....

Mobile:

E-mail:

School:

Appendix F: Summary Evaluations from Pilot Seminars

Seminar: *Science Differentiation in Action: An Evening Seminar for Junior Certificate Science Teachers*

Presenter(s): Sean O’Leary (SESS), David Keenahan (IOP), Paul Nugent (IOP)

Date: 14/09/09, 21/09/09, 29/09/09 (7 – 9pm)

Venues: Blackrock, Drumcondra and Wexford Education Centre

Number of participants: 81

Number of Females: 62

Number of Males: 19

Number of Completed Evaluation Forms: 78

1. Please rate the following:

	Excellent	Good	Average	Fair	Poor
(a) Presentation	92%	8%			
(b) Content	92%	7%	1%		
(d) Strategies	87%	10%	3%		
(f) Relevance	88%	10%	2%		

2. Please rate the following:

	Excellent	Good	Average	Fair	Poor
(a) Venue	69%	28%	1.5%	1.5%	
(b) Notice received	50%	36%	9%	4%	1%
(c) Refreshments	47%	40%	12%	1%	

Further comments/suggestions:

Great ideas – very simple to apply, overall excellent!

I really enjoyed the presentation, DVD and the science resource pack looks really helpful. It was extremely worthwhile.

So relevant, I could watch those experiments all day! Would love a visit from you science guys to my school.

Thank you very much for an extremely useful and resourceful evening – I have gotten plenty of ideas for use in my classroom/lab!

PowerPoint presentations are excellent with understandable language and down to the point. The kids love the quizzes on the topics. Thanks.

Very practical. We need more demonstrations to engage all students. Thank you.

More of the same – excellent.

Far more interesting attending when material is practical and can actually help in the class room.

Experiments can be used and the explanation about what is happening is excellent.

This is what in-service should be all about.

Demonstrations excellent. Written explanations on experiments would be great. More of the strategies for teaching students with MGLD and moderate learning disability.

All useful. Plenty of ideas and suggestions. Would like to hear about strategies to deal with disruptive “grabbers” and group work.

Very helpful. Thank you. I will definitely take some of these ideas on board. Great to get the benefit of others experience.

More demos. A DVD of all the demos as hard to remember them all. Very good night. Thanks.

More physics i.e. more of the same but also some on biology and chemistry. Got lots of ideas – found the evening very worthwhile.

Brilliant ideas and demos. Excellent overall. Differentiation DVD will be extremely useful and the science resource pack CD.

Excellent suggestions for physics

Very good, directions to find the place would be useful

Very interesting and relevant

The Science Differentiation in Action book/CD is terrific – used it with first years last year. A pity it does not cover all JC topics. Thank you.

More time needed for presentations especially physics resource presentations, would appreciate another in-service especially on JC physics.

Very good ideas on incorporating all students especially those with special needs.

Prepare a DVD of 30 second clips.

Need more time and more experiments – great stuff guys! Thanks so much. Come back with more.

Practical stuff was awesome. Thanks so much.

Really helpful, Thanks a million.

Very interesting methodologies and display of experiments. Thank you.

Have physics demos on IOP web site. Maybe some suggestions on homework.

Excellent examples and practical.

Two hours dedicated to these sorts of techniques would be worthwhile for first-time physics teachers.

Very informative – some more actual resources, examples how to carry out co-operative learning would be good.

Too short, great.

This is all brilliant but really we do not have time to do the preparation work as there is a lot of preparation involved in the ordinary syllabus to higher level leaving cert so please lobby the dept. to give us time for training.

Some great ideas that I will seek to integrate in my school.

Really useful resource pack.

Excellent – could have done with more time. Great ideas.

Slightly bigger room would be good. We should record Paul and David's demos and put on the net.

Action packed! Need more time.

Good resource pack. Worksheets are very accessible. Good for refreshing learning.

Need more time.

Great ideas. Looking forward to trying some in class.

Great to be going away with some practical things that can be used. This is an area I'm really keen to get better at but I find my time is really limited. I can only develop a small amount of new resources. I would come to an evening where I made a set of cards/PowerPoint's – I have good intentions but need help to get things done.

Excellent workshop – more time would be needed to carry out experiments. Maybe a day where you could go through mandatory experiments from a differentiation aspect in all areas of science.

More time to explain what's happening in each demo. Thank you.

A day in-service would be fantastic.

Science Differentiation in Action – started using worksheets – my class found the safety worksheet difficult to remember the answers to after 2 weeks but I found it extremely useful. If all the wonderful web sites were freely available to every school – it would be great.