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Teacher Researcher Programme 2008/2009

To Investigate the Effect of Wii Music Software on the Knowledge, Attitudes and Values of Children in Music Education

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and hands made life so much easier and well done to all of you who had a go on the handbells!!

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ABSTRACT

The use of Games Consoles in the home is becoming an ever increasing form of entertainment for today's children. Whilst these games are primarily aimed at the home entertainment market this research aims to investigate the use of Games Based Learning in an educational context. Although specifically relating the Music education the motivational aspect of the research could equally be applied across the subject range. Music education is traditionally based around the Western Art Tradition but this may alienate some learners in that it may not fully engage those learners who find formal education a challenge. The aim of the research is to investigate the possibilities using Wii Music to engage and motivate children in the subject. A second aim was to establish any links to children acquisition of knowledge of musical concepts through playing the games on Wii Music. Although the research showed some improvement in skills and attitudes further research would be required to consolidate the initial findings.

1. Introduction

1.1 Background

I began working as a Curriculum Support Teacher in Music in 2008 after many years as a teacher in England. After completing my first year and supporting the learning of Music in the Scottish Borders I suggested that one of the contributing factors in the lack of acquisition and improvement of musical skills is a lack of pupil motivation for the subject. I came to Scotland committed to the success of A Curriculum for Excellence and through my experience of factors such as subject disaffection I was anxious to maximise my time in school and the children's learning by improving motivation in the subject. Lack of motivation is not a new phenomenon. Ken Robinson (2001) has previously identified the problem of subject hierarchy in education. He states that our current educational tradition is very much divided into Arts and Sciences. If this division is to continue as it does in Primary education today many children may have artistic abilities which are overlooked within a regime of testing aimed at the core subjects of Maths, English and Science. Children may, therefore, have not yet experienced success in their education and already be at risk of disaffection. It is a problem which is ongoing and through my research I hoped to support other teachers by suggesting ways in which to encourage young people to be motivated to learn both in the short term and in their lifelong learning.

Motivating children to learn can be a challenge because, as Johnston (2005) suggests, there may be outside influences such as the media or computer games which are barriers to optimum learning. An understanding of the need for motivation is crucial in helping children to achieve their full potential. Alderman (2008) suggests classrooms which try to foster motivation have similar features. One of the significant features is the opportunities for children to participate in decision making and develop a

responsibility for their learning. At the end of the Wii project when asked about the children's opinion of the work done one child commented that he enjoyed the fact that during the Jam sessions with his group they were 'in control'. Another factor may be pupils' perceptions of their own ability. Alderman also suggests it is probable that primary age children have already gained a very clear picture of their own competence. I felt this did occur in some cases during the project. An example was when the class were asked to give the project a score out of 10. One child (the only one in the class to score below 5) gave a 2. When asked why this was so the answer was straightforward, and to them, perfectly logical: 'I couldn't do it'. His inability to cope with the more open ended task of improvisation meant that his motivation to achieve had decreased.

My current job requires me to aim to improve children's access to music and broaden their knowledge in line with the current thinking when implementing the new Curriculum for Excellence. I felt the following research would help me to improve my job effectiveness, enhance the enjoyment of the children and support more fully the aims of Curriculum for Excellence.

1.2 Aims and Objectives

At the initial formulation of the project I had in mind two main objectives

- to assess the effect of Wii technology on children's musical skills in the areas of pitch, notation and timbre
- to assess the effect of Wii technology on children's attitudes and motivation in music.

The second objective, although initially intended to specifically assess the effect in music, could equally be a cross curricular issue and does not necessarily relate only to musical objectives. It may be interesting to engage in further research to study the effects of how participating in this sort of technological project could indeed impact on children's broader attitudes and motivation across the

subject range.

In order to achieve the stated aims, objectives of the research were linked to the Curriculum for Excellence capacities.

Successful learners
- I like to think about new ideas and try new things
- I can use technology to help me learn

Confident individuals
- I want to do well in the things I choose to do

Responsible Citizens
- I join in with things in and out of school
- I begin to make my own choices

Effective Contributors
- I find trying new things exciting
- I can work with a partner and in a group
- I can use my own ideas and imagination to create something new and then try to improve it

1.3 Proposed Research timescale

From the start of the project an estimate of 30 weeks was given to completion with the following proposed timescale. Informal verbal feedback sessions were held at the end of each Wii Music session with pupil comments recorded in written form.

Week 1	Administer Likert Questionnaire
Week 2	Analyse data
Weeks 3,4,5	Collect initial data from pitch activities
Weeks 6,7,8	Collect initial data from handbell activities

Weeks 9,10,11	Collect initial data from performance activities
Weeks 12,13,14	Collect second data from pitch activities
Weeks 15,16,17	Collect second data from handbell activities
Weeks 18,19,20	Collect second data from performance activities
Weeks 21,22	Collect verbal feedback from pupils
Week 23	Administer Likert Questionnaire
Weeks 24,25	Collect any missed data
Weeks 26,27	Interview selected pupils
Weeks 28-30	Complete data collection and analysis of results.

1.4 The Software

The Wii Music programme is split into a number of different sections some of which I have used to fulfil the aims above. The following descriptions give some idea of the musical learning that has taken place using different parts of the program.

Lessons

This section explains how to play each instrument and gives the children opportunities to practise on virtual instruments. Although not real instruments it is able to show children a short description of instruments and how they are played.

Games

Handbell Harmony

This section allows the children to play virtual handbells. The handbells can be used in various ways with groups of up to four children. We specifically used Do Re Mi song to explore the use of scales in

music and how to use different scales when we compose using traditional instruments. This also allows children to see how pitch is organised within music. The handbells allow the player to achieve an individual score, thus allowing some element of self assessment and peer group assessment with those not taking part in the performance. The game can be played at different tempi and with or without complex notes such as accidentals.

Open Orchestra

This is a game aimed primarily at following a beat, putting children in control of a virtual orchestra to create a full performance. This, like Handbell Harmony gives children an individual score at the end.

Pitch Perfect

This game deals with various aspects of pitch including high, low, harmony and also the relationship of major and minor sounds. The children found this incredibly difficult to master to begin with. It has a number of levels increasing in difficulty. The score is given for a group performance; up to four can play at one time. As this is played against the clock the need for a high level of concentration cannot be understated.

Jam

This section allows children to 'jam' as a group. This can be using their own improvised rhythms or by following a given score. The children can choose the setting of their song, save a video and email it to friends or to home. Although the children do not get a score based on their performance they are encouraged to appraise their own performance and award themselves a score. It is interesting how children can be very critical, although honest about their own performance. Very few children awarded themselves unreasonable scores.

Videos

The videos section lets the children watch the videos made during the 'jam' sessions. The groups are able to make their own virtual CD covers and videos are stored electronically. The videos of other groups and classes can also be watched and appraised and can also be shared via an internet link.

2. Literature Review

2.1 Musical Education in the 21st Century

Our current inheritance of how to think about music and how to teach music is coloured by a very strong past tradition in Western Art Music. To consider music lessons within this tradition in the 21st Century may be doing a disservice to both our pupils and to ourselves as teachers. This way of thinking may not be appropriate in this new technological age. Cook (2000) suggests the word 'Music' represented a stable meaning 100 years ago, that which stood firmly within the European Art Tradition typified by Haydn, Mozart and Beethoven. In some schools today music and the attitudes towards it still evoke this past, a past where music should be listened to attentively and with respect. Can we, and should we expect our future musicians to have the same ethic? Should children growing up in such a fast changing world still be held to the traditions of music created over 100 years ago? Popular music, the very genre with which children engage on a daily basis has, in music lessons, been very much on the periphery. It is, however, a perfectly valid form of music. Its study in schools is increasing from its very early presentation in the 1980s when the C.S.E Syllabus in England radically included the study of 'Bohemian Rhapsody' by Queen. Musical education needs to continue to change. The wealth of technological advances means access to all forms of music is easier than ever. All music is music, whether created by an orchestra, an opera singer, a pop star or by a computer chip. It is within this structure that Robinson (2001) claims the hierarchical nature of subjects is no longer valid or useful. It would be hoped, however, that the new curriculum and the opportunities it affords to blur this division of arts and sciences will create a more holistic approach to education in the 21st Century.

2.2 A Changing World

The emphasis on scientific and mathematical knowledge was a necessary part of education during the

Industrial Revolution. This emphasis is beginning to change. The world our children are now growing up in is in the midst of a technological revolution. From the origins of computer use in the 1980s educational researchers such as Stephen Heppell were already beginning to explore the potential of its use in the classroom. Ultralab, originally founded by Stephen Heppell amongst others, came into being in the early part of the 1990s with the specific remit of research into learning technology based in Anglia Ruskin University from 1993-2006. By the closure of the project in 2006 the research had already highlighted the potential of online communities for sharing innovation and creative practice. One example of this was the Schools Online Project. Originally funded by the Department of Trade and Industry the aim of the project was to encourage collaborative discussions between participants and that all should have an active role in authoring pages and contributing to discussions. This was an interesting project for myself as it came at the very beginning of my teaching career and although not actively involved as a participant I was able to see the potential of this project. Part of my thinking in using the GLOW website as an online discussion site for children participating in the Wii project was as an additional method of discussing their thoughts and ideas. It was recognized already by many at this stage that the technological revolution was going to transform the way we work. Although the early computers were somewhat unsophisticated they have evolved quicker than anyone can imagine possible. When I first qualified as a teacher the Nintendo Wii was still 11 years away from its launch date of 2006. To ignore current technological innovations in this changing world would be missing a huge opportunity to expand children's learning. To embed this technology into classrooms of today, however, requires teachers to take considerable risks. Creative practice in education and innovative use of technology is not something that is going to be easy.   There are many obstacles yet to be overcome when considering the use of technology in schools (Kirkland and Sutch, 2009) with a major factor seen to be borne out in both this research and the NFER Teacher Voice Omnibus Survey (2009) being the

perceptions and attitudes of teachers and their lack of confidence and / or lack of perceived benefits in using games technology in education

2.3 Today's World

Children today are immersed in the world of technology. By comparison those who teach them do not appear to be. In the NFER Teacher Voice Omnibus Survey (2009) 42% of respondents never played computer games. Perhaps surprisingly then 35% had used computer games in the classroom. This of course does not give any indication about the frequency of use. Of those only 7% of had used the Nintendo Wii. 60% of those questioned would consider using games in the classroom. This may go to show that although the use of computer games is not an unusual occurrence the use of Games Consoles in schools may still be at the very early stages of exploration. I feel with my own research, however, it is an area well worth exploring for the future of technology use in classrooms.

Traditional teaching methods may not always be engaging for all children (DeFreitas, 2006). Teaching, in any subject, should engage and we should therefore endeavour to engage children at all levels. This includes embracing new technologies and overcoming our perceptions about its use in the classroom. The use of technology, however, is not about replacing the normal classroom activities but by complementing them. As the Games Based Learning Report recommends (JISC, 2007) use of technology in the classroom needs to be differentiated as the use of technology itself may still not engage all learners. Motivation is a key aspect to developing this more personal learning experience for children. The use of technology as an additional teaching tool in the classroom allows children greater flexibility in their own learning and a choice of learning styles better suited to their own interests and attitudes. Bolton (2008) identifies the use of ICT as a possible tool for engaging those children, even at

primary level who find a formal learning environment difficult to work within. Although her research is based around only a single child it is possible to see the benefits for that particular child in having a learning experience more fully suited to his own experiences and his own attitudes to learning.   If this use of Games Based Learning in schools is to succeed and flourish we need to try to overcome the view of games seen purely as a fun incentive and view them as an integral part of both children's classroom experience and home experience.   Learning Teaching Scotland with its advent of the GLOW website and the Consolarium web pages are in effect helping to give teacher permission to do this.

2.4 Looking to the Future

The future for our children is uncertain. We are preparing them for a future which as yet, we do not know (Robinson, 2001). In that respect we must equip children with skills they may need in the future. This is a difficult prospect for educationalists in that we are unsure as to what those skills might be. He suggests, however, that rather than being physical skills they ought to be skills which help students to,

'think intuitively, who are imaginative and innovative, who can communicate well, work in teams

and are flexible, adaptable and self confident.' (Page 52)

This is certainly no small task when designing a curriculum. Online discussion and conferencing forums are an ever increasing way to exchange knowledge. In the 1990s the DFEE in England commissioned a report into the proposed use of a National Grid For Learning, an online platform for pupils and staff to exchange information and participate in online discussions. Stephen Heppell refers to it as 'paradise lost', a monumental lost opportunity to embed this technological innovation into the lives of children and teachers. This is one reason I have been so keen to use the GLOW site within the project. This is an

opportunity for pupils and teachers to share their work, their ideas and their experiences. This peer support would overcome one of the barriers to innovation stated by Kirkland and Sutch (2009). In their research, teachers' lack of familiarity and support mechanisms were major reasons for the implementation of technology failing to live up to expectations. The skills needed to build knowledge through dialogue with peers, discussion forums and social interaction with others are considered additionally by Sara DeFreitas (2006). She states that the social interaction children gain from games can be a worthwhile outcome. The ability of children to develop leadership skills within a team situation and to practice their mediation skills by reducing and managing hostilities when working in groups will be something they will be required to use in their lives in the future, whatever it holds.

3. Methodology

3.1 Key issues arising from the Literature Review

The issues arising from the Literature Review were varied and complex. These issues, however, were important when approaching the research and during the period of research itself. The main issues which seemed to take precedence in the available research were as follows:

Environmental

It was important for me to be able to provide children with a good level of access to equipment. The class sizes varied from 16 to 33 pupils which was a significant factor in the availability of equipment for children in the participating groups. In none of the schools was there access to technical support for the project so the preparation and maintenance of equipment was an individual issue. The length of lesson varied from 35 minutes to 1 hour 15 minutes which again was a factor which impacted upon the children's involvement.

Teacher attitudes

When considering the project I met the head teachers of all the schools involved to explain the project in terms of educational objectives. It became clear that attitudes amongst the head teachers involved varied considerably. It was, therefore, essential when organizing the project that they were fully informed at all stages regarding a number of key concerns. One of the main concerns is the impact the research may have on others. As I am non class based this was not a significant issue until the children wished to gain access to GLOW which impacted on other classes when the ICT suite was being used.

Concerns were raised regarding the impact the teaching would have on more traditional musical learning

such as singing. It was necessary, therefore, to retain a level of traditional teaching to work alongside and complement the Wii project, for instance by using Do Re Mi as a singing task alongside its use on the Wii Music project. A small number of staff were concerned about the benefits of the project and struggled to perceive the benefits for the children involved. This was borne out by the research conducted by NFER (2009). Although not specifically designed to cover the use of Games Consoles this research surveyed teacher's attitudes to using computer games in the classroom. 6% of teachers recorded the use of Nintendo Wii in the classroom. 60% of teachers would, however, consider using games primarily designed for entertainment in the classroom. A more significant number, and one which relates closely to my own research in terms of perceived benefits, was the fact that 50% of teachers felt the link between playing games and the wider learning objectives were not always explicit. Strengthening these links between subjects, especially within the framework of the Curriculum for Excellence, and showing the benefits across the subjects were beneficial in helping teachers to make the links between learning and games.

Motivation

The aim of the project was to try to make the lessons more learner centred in their approach as researched by Bolton (2008). In addition to the use of ICT as the project progressed the children were further motivated by the social aspect of the game and their ability to compete on a team basis.

Parental Concerns

I had anticipated a number of parental questions regarding the project but in the event only one parent refused to allow their child permission to take part. This permission, however, was granted part way through the project when perceived problems were addressed. The main issue this particular parent

raised was the conflict of games based learning and traditional learning. A letter was sent to all parents of children involved prior to the start of the project to try to assuage these types of fears.

3.2 Design

The research was designed to cover parts of the following objectives from Curriculum for Excellence:

- EXA 1-17a : I can use my voice, musical instruments and music technology to discover and enjoy playing with sound, rhythm, pitch and dynamics
- TCH 1-03b: I can access, retrieve and use information from electronic sources to support, enrich or extend learning in different contexts
- TCH 1-04a; I explore and experiment with the features and functions of computer technology and I can use what I learn to support and enhance my learning in different contexts
- EXA 2-17a I can use my voice, musical instruments and music technology to experiment with sounds, pitch, melody, rhythm, timbre and dynamics
- TCH 2-04a: I explore and experiment with the features and functions of computer technology and I can use what I learn to support and enhance my learning in different contexts

The objectives are very broad and it would not be possible, in the design of the project to incorporate all aspects of the objectives. As the design progressed I also felt objectives relating to the first stage, EXA 1-17a, TCH 1-03b and TCH 1-04a would be largely irrelevant for the age group chosen (P4-7).

Although the research began as planned, within the first week it became clear that the timescale would be largely academic once the school term began.   The administration of the Likert Scale took much longer than anticipated with some teachers completing this within a day or two, some taking over a month and one teacher not returning it at all which meant adjusting the classes involved in the project from the second week onwards. Activities from weeks 3-20, were dependent on many outside factors, such as school events, especially Christmas, when 4 weeks lessons were lost due to performance rehearsals. It was, therefore, difficult to stick to a timetable quite so rigidly as intended, although all pupils had completed both first and second data collections by the end of the project. An addition to the timescale was the inclusion of two sessions using the Wii Glow Group so the children could discuss

their ideas and achievements with other children on the project.

The final Likert collection was completed surprisingly quickly, with all teachers forwarding the results within a week of being issued.

The main amendment to the research was the omission of selective pupil interviews. Rather than gather information from a small number of pupils all classes took part in a final group discussion to highlight issues of motivation, musical skills and any positive or negative impact they may have felt.

3.3 Participants

The schools were a cross section of Primary schools from across the Scottish Borders Region:

School 1:   Class A: Composite Class P4-7 - 20 pupils

School 2:   Class B: Composite Class P5-7 – 17 pupils

School 3:   Class C: Single Class P4 – 28 pupils

                 Class D: Single Class P4 – 27 pupils

                 Class E: Single Class P5 – 33 pupils

                 Class F: Single Class P6 – this class returned no Likert information and did not, therefore,

                     continue with the project

                 Class G: Single Class P6 – 24 pupils

                 Class H: Single Class P7 – this group were removed from the programme by the school

                 Class I: Single Class P7 – 31 pupils

School 4:   Class J: Composite Class P4/5 – 23 pupils

                 Class K: Composite Class P5/6 – 24 pupils

Class L: Single Class P7 – 20 pupils

School 5:   Class M: Composite Class P4/5 - 23 pupils

Class N: Composite Class P6/7 – 16 pupils

From each of the 5 schools classes groups were chosen across the 4-7 age range to participate in the research as I felt the younger children would lack some of the fine motor skills necessary to benefit from the full potential of the research.

3.4 Procedure

Prior to beginning the research all staff were given an information sheet detailing the research project and giving an outline of the objectives. Children were then given an information letter to give to parents along with a permission slip to return to me prior to beginning. This initially took longer than anticipated and permission slips were received from all pupils except one within 6 weeks of the letters being sent home. This obviously delayed the start of the project until October when the practical part of the project began. Children completed a Likert questionnaire to establish attitudes towards music at the start of the project. This, I felt, was somewhat unreliable. One main reason was that although a detailed script was given to staff I was unable to establish how closely this had been adhered to. In one school only was this procedure completed by a single person. In the following weeks all groups completed 2 pitch related activities, 2 performance related activities and 2 handbell activities. Some groups with smaller class sizes were able to have additional attempts but these were not used in the final data collection. At the end of each session an informal discussion was held with each group and comments logged. Two sessions were held where children could access the Wii Discussion Forum on GLOW although this was hampered at times by unreliable access. At the completion of the project a second Likert questionnaire

was administered in the same way as the first to establish any improvements in the attitudes of children towards music as a subject. Again, it is difficult to say with any degree of certainty as to how accurate the result of this Likert questionnaire were as again there was only one school where a single person administered the questionnaire to all groups.

4. Results

4.1 Likert Scale Results September 2009

The Likert Scale Questionnaire (Appendix 1) posed a number of problems. Firstly I made it clear to the schools that I did not wish the children to be aware that the questionnaire was from me. I therefore requested the support of all schools in administering the test themselves following the guideline script (Appendix 2). I requested that all staff follow the guidelines given in order for groups to have as close a match as possible when completing. I had not anticipated, however, the amount of additional help some teachers would give to pupils and it was therefore difficult to gauge how accurately the script was followed.

268 pupil responses were collected with the following results. (Percentages may not total 100 due to rounding)

	Strongly agree / agree	Neither agree not disagree	Disagree/ strongly disagree
I like listening to music at home	248 93%	9 3%	11 4%
I like listening to music at school	184 68%	53 20%	31 12%
I enjoy playing musical instruments	207 77%	40 15%	21 8%
I enjoy singing	174 65%	39 15%	55 21%
I enjoy music lessons in school	164 61%	51 19%	53 20%
I think music is an important subject in school	160 60%	63 24%	45 17%
I think music lessons will help me when I grow up	155 58%	55 21%	58 22%

4.2 Likert Scale Results April 2010

207 pupil responses were returned at the end of the project. (Percentages may not total 100 due to rounding)

	Strongly agree	Neither agree nor disagree	Disagree
I like listening to music at home	194 94%	9 4%	4 2%
I like listening to music at school	119 57%	47 23%	41 20%
I enjoy playing musical instruments	156 75%	40 19%	11 5%
I enjoy singing	129 62%	35 17%	43 21%
I enjoy music lessons in school	122 59%	53 26%	32 15%
I think music is an important subject in school	124 60%	55 27%	28 14%
I think music lessons will help me when I grow up	112 54%	47 23%	48 23%

4.3 Likert comparison

The following table gives a clearer comparison of the results from both questionnaires. Initial results are in plain font with end results in bold.

	Strongly agree / Agree	Neither agree not disagree	Disagree/ Strongly disagree
I like listening to music at home	93% **94%**	3% **4%**	4% **2%**
I like listening to music at school	68% **57%**	20% **23%**	12% **20%**
I enjoy playing musical instruments	77% **75%**	15% **19%**	8% **5%**
I enjoy singing	65% **62%**	15% **17%**	21% **21%**
I enjoy music lessons in school	61% **59%**	19% **26%**	20% **15%**
I think music is an important subject in school	60% **60%**	24% **27%**	17% **14%**
I think music lessons will help me when I grow up	58% **54%**	21% **23%**	22% **23%**

It is interesting to note from the table above that there appears to be very little difference in scores between the initial Likert Scale and the final Likert Scale at the end of the project. Although this appears to contradict what I had envisaged, that pupils would show some improvement in attitude towards the subject, it does not take into account where variations occur. There are a number of reasons these

variations may not show on the final comparison. For instance, Child 100 when initially asked tick 'I enjoy music lesson' indicated the 'disagree' column. In the final Likert scale Child 100 indicated the 'agree' column. In comparison Child 4 indicated the 'agree' column initially but then the 'disagree' column at the end. Although this is only two pupils it does show the potential for some results to cancel themselves out thereby keeping the table even. Had there been more time during the project, and if the research were to continue in some way it would be an interesting study to take a closer look at the responses of individual children to establish with greater certainty which children benefited from this type of learning and which appeared not to.

The results also do not necessarily take into account the difference in the number of responses received in the final questionnaire. The results may have given a more accurate picture had the number of respondents been closer. In the final number of children there was a significant amount of absences due to child illness, groups taken out of class for additional work and groups not in class due to National Testing.

4.4 Wii Music Scores

Pupils received scores on the Handbell sections and the Pitch sections. The Jam section of the software was a self assessed work with no scores given electronically. The number of attempts each group received was dependent on a number of factors which made it difficult to compare results for different classes. I have, therefore, indicated below the percentage of children who improved their scores during the course of the project on Handbells (beat, rhythm and group performance) and Pitch Perfect (pitch recognition).

Class		Handbell Harmony	Pitch Perfect
A	P4-7	40%	65%
B	P5-7	70%	70%
C	P4	22%	Did not complete
D	P4	16%	Did not complete
E	P5	57%	Did not complete
G	P6	67%	60%
I	P7	62%	57%
J	P4/5	60%	Did not complete
K	P5/6	50%	37%
L	P7	80%	70%
M	P4/5	55%	Did not complete
N	P6/7	81%	70%

Pitch perfect was not completed for all groups as the task was too hard for the lower age groups. As a result only those children in the upper groups completed this task. Data collected from the performance activities in weeks 9-11 and 18-20 was collected as a discussion forum with notes on pupil response taken at the end of the session. Those pupils who did not complete the pitch activities in weeks 3-5 and 12-14 completed an extra session on the Jam section using musical scores.

4.5 Pupil Feedback on Performance Tasks

Pupils were asked to provide self assessment feedback through a discussion forum at the end of the Performance sessions in Weeks 9-11 and 18-20. This ranged from comments on their performance to attributing scores to their performance depending on which method they preferred. Self assessment in this way was an unusual experience for the children and they found it very difficult at first to honestly appraise their performances. There were, however, some very insightful comments. On group in Class B gave their performance a score of 75/100. When asked why it was not a perfect score their answer was ' it didn't follow the score fully' which showed a good level of understanding of the process of using a musical score in order to improve performance. Of those groups who gave themselves a score there were no groups who awarded themselves 100 points.

4.6 Result Limitations

As the project progressed it became clear that the method of collecting results had a number of limitations. The Likert Scale, although easy to understand, relied heavily on teachers understanding of the importance of following the script as closely as possible. As I was not present it is unclear as to exactly what teachers said to pupils during the administration. This may have had some impact on pupil results. Having collated results of the Likert Scales it became apparent that there were certain interesting results within classes that are not necessarily shown up on the data results. For instance, some classes showed a much more positive attitude to music at the end of the project which is not borne out by the overall percentage increase.

Although the data collected by the Wii Software was very clear and easy understand there were concerns voiced, mainly by the older children as to whether the data could be a true reflection on the

performance, especially in the handbells. It has to be understood that by collecting data from a games console you have no control over the data and there may be instances where the data is not a true reflection. This should be borne in mind when using this numerical data.

5. Discussion

When I began the project the two main aims were:

- to assess the effect of Wii technology on children's musical skills in the areas of pitch, notation and timbre

- to assess the effect of Wii technology on children's attitudes and motivation in music.

Although the results have given me some indication of the success or otherwise of both of these aims I do feel they have also left a number of questions still yet to answer.

The data from the Wii software clearly shows that the children did indeed improve their scores with practice. It has to be remembered though, that although three weeks were allocated to each block of work the children did not necessarily complete an equal number of attempts. There were a number of reasons for this.

Class Size

The classes ranged from 16 to 33. It became clear very quickly that the classes would be very dependent on their class size when allocating attempts. Pupil feedback at the end of the project cited this as a negative aspect of the project but only for those classes where numbers were above 25. Groups below 25 did not give this as an issue during the project. Example comments from children included 'I only got one go' and 'It's unfair because we don't get a go each week'.

Lesson Length

Lessons ranged from 35 minutes to 75 minutes but this was not an issue cited as a problem by any of

the classes. Although the majority of lessons were timetabled for 45 minutes in a number of schools the time taken for pupils to arrive at the lesson, especially after a PE session when changing time has not been factored in was detrimental as between 5 and 10 minutes could be lost from a session purely due to logistics. This was not a factor, however, in the school with the shortest time of 35 minutes. The head teacher in this case allowed a 5 minute turnaround between classes which enabled all classes to gain a full 35 minutes. In reality, most classes probably had 35 minutes of true teaching time within the allocated 45 minutes. The school with the extended time of 75 minutes gained a huge advantage in this case as they were able to complete a full session on the Wii software with little effort.

Class composition

A third contributing factor lay with the composition of the classes with regard to age group. The results from the Wii Music software show that the lower single year age groups generally did significantly worse in all aspects with a general trend of the most improvements being gained as the children got older. This was not, however, universal across the groups as some classes were composite in nature. Where there were a mix of age groups the children did slightly better, although this also depended somewhat on the proportion of children in each age group. Class A for instance, had a fairly even mix with 5 children in each of P4,5 and 7 and 4 children in P6. Class B, however, with only three P7 children did extremely well, but they, of course, also had the longest time.

The combination of the three factors mentioned above all had an impact, though somewhat complex, on the achievements of the children during the research period.

When assessing the impact of the Wii project on children's attitudes to learning the issues were even

more complex. Factors affecting their attitude were not necessarily something they, or I, had any control over.

School Organisation

The school management and organisation has a direct bearing and influence on the conditions under which the research takes place. An example cited earlier is School 5 who arranged for music lessons to be 35 minutes in length rather than 45 allowing time in between each class for preparation of equipment taking into consideration the fact that there were two additional classes not taking part in the research for which preparation was also required. This was a much more effective organisational structure which allowed the children to be comfortable and settled immediately with no time lost due to the logistics of movement and preparation.

In contrast, School 3 has larger pupil numbers and a much more complex timetable to negotiate. For these lessons the pupils are allocated 45 minutes. This time, however, does not allow for the collection of pupils and the movement of pupils to the music room, which is not situated in the main building. In addition, the classes are often timetabled back to back with a PE specialist for their lessons which involves time for changing into or out of PE kit. As no time is allowed for this outside the 45 minute lesson, and as the class teacher at this point is sometimes not in the classroom (allowing for their RICCT: Reduction In Class Contact Time when teaching staff are not with their class) when the children are returned the organisation is not always conducive to a smooth running lesson.

The extent to which the school understands the scale of change required for new and, possibly, innovative projects also has a direct influence on the research project. A willingness on the part of

school staff to use, and accept the use of, Games Consoles relies quite heavily on staff seeing the usefulness of the equipment and software. As teachers, we are sometimes very resistant to change, not necessarily for negative reasons, although the perception of having fun rather than learning with ICT can be a barrier, but sometimes simply through lack of confidence and understanding of the hardware.   The most noticeable change in pupils attitudes came from those classes whose schools had taken the time to understand and even on occasions participate in the research. An example was Class L. The head teacher had made every effort to come to music lessons on various occasions to join in and celebrate their success. A classroom assistant in place to support a child with learning and behavioural difficulties participated in the games with him. The class teacher had been aware of the children's access to GLOW and although the children themselves were not able to access it alone the teacher accessed it so she was able to see their comments and discuss them with the class. The results of both attitude and learning were immense. On the initial Likert Scale there were significant numbers of children for whom Music lessons were irrelevant. On the final Likert Scale there were no pupils who marked the Disagree / Strongly Disagree section of the scale in any category. Their improvement scores were also high with 80% of children improving their handbell scores and 70% improving their pitch scores.

The above example shows very clearly how a number of factors can influence the success of a new project. It cannot be done by a lone teacher without support and encouragement from the whole school. This support needs to arise from the school's willingness to meet students needs and their recognition of the changing world in which we and our students live.

6. Conclusion

The research project has been immensely enjoyable and at the same time immensely frustrating. One of the objectives was to assess pupils' attitudes to music and see if the project would have any impact on this. It did have impact but not necessarily in the way I had hoped. On completing the Likert Comparison I was surprised by the closeness of the results from the initial questionnaire to the final one. After looking more closely at the results, however, there are significant changes between classes although this did not make a large impact overall. It is somewhat frustrating to have results which do not fully show the extent to which certain groups either excelled in the activities, or in some cases were demotivated by them. It was particularly pleasing to see individual achievements which for some children were huge improvements. At the same time it was frustrating to realise that some children found it demotivating but without the time in this project to take this further.

From this initial research it has become clear that the use of Games Based Learning has come a long way but still has a very long way to go before it is accepted fully. It is a teaching strategy, like all teaching strategies, which is appropriate for some children. From my initial results, however, it is clear it is not a strategy which will engage all learners, as no strategy is able to do. It could be a very powerful strategy to show pupils a new way of learning, perhaps, as in Bolton's research (2008) suggests for those who are difficult to engage, or who find formal learning a challenge. For those pupils, who still deserve an opportunity to engage with and access musical education, it may be a very motivating experience.

7. Recommendations

7.1 Policymakers

It is essential that policymakers recognise the need for innovation and creativity in education if we are to prepare our learners with flexible skills. To encourage this innovative and creative way of teaching there should be appropriate guidance, advice and support to schools giving them opportunities to use and engage with technology. My own research outcomes suggest there is a strong link between the use of technology and motivation for some learners. This link, however, would require further research in order to explore how participation in this sort of project could enhance the children's motivation and personal development across the subject boundaries. The new curriculum has given teachers an opportunity to expand their teaching strategies and broaden their knowledge but appropriate opportunities both for experiencing and for sharing this practice needs to be made in addition to continued rigorous research in this area. Teachers need to be given time to develop and explore the possibilities that the use of Games Consoles in schools might offer their pupils.

7.2 Schools

Schools have a major part to play in encouraging innovation and creativity. The vision of the school should be one which is shared by all staff, one where the risk taking involved in creative practice is valued and understood and where those who wish to innovate can do so in a supportive environment. The support does not merely come from personal support but also from the support through resource implications. To be involved in creative practice using technology there must be a clear understanding for the need of good access to high quality and reliable technology.

Innovation by teachers requires significant hard work, not necessarily completed in the classroom and this should be appreciated and accepted by schools. This acceptance of the level of commitment

needed will encourage teachers to gain high levels of trust in their own professionalism. Where test results are used to measure the success of teachers this trust in their professionalism may be eroded.

7.3 Developers

Designing a game suitable for the most critical audience is no small task. Some comments the children have given regarding the design of Wii Music have been highly critical. It does, however, give developers an opportunity to really hear what their target audience thinks about their product. The main frustrations children found with the software was the difficulty of sharing their work. Children are able to share their music videos via an internet link but only to another Wii machine fitted with Wii Music. They were frustrated that the music videos were not able to be downloaded via a laptop and thereby published onto the GLOW website or shared with their class teacher when they returned to the classroom. The issues of course would then need to be those in the realm of copyright, a very complex area to navigate.

Another area in which the children felt the game was lacking was the choice of songs. Although they enjoyed the games they felt the songs were too traditional and did not engage them enough in some cases. Rather like Wii Just Dance, a more modern and up to date approach in the choice of music would have been appreciated.

7.4 Teachers

Teacher resistance to change can sometimes stem from a lack of confidence or a lack of perceived benefits in using the new technology. It is important that time be allowed for exploration and sharing of practice for any new innovation to work within a classroom setting. When considering using the Wii

Music software the children undertaking this project were very understanding of the limitations when using it in the classroom. The nature of the software is that only a maximum of 4 children can be using it at any one time. Although this is less of an issue with small classes it is certainly something to consider when class sizes begin to reach 25-30. Deciding when and where to use the equipment in order for all children to benefit does not necessarily mean using it in a whole class situation, although there are advantages in this approach on occasions. Whole class teaching does enable children to see other approaches and to discuss further their problems and solutions to them.

How teachers view the use of Games Consoles in the classroom determines their success or failure. An example of this was Class L, a challenging class with a significant number of children for whom formal learning is a challenge. The class had phenomenal success through this project and were highly motivated to achieve. Their class teacher, teaching assistant and head teacher were all at times engaged with the project and took part in some of the games. Their input and visibility during the project allowed the children to compete on a more equal level, and sometimes beating the teacher was an added incentive. The staff willingness to take part and sometimes make mistakes was a huge motivation for the class. It is sometimes hard to see Games as anything other than a fun incentive to achieve. Games Consoles are, however, a fundamental part of many children's lives and we have an obligation as educators to understand this just as much as we understand books and scientific concepts. To ignore this major part of children's lives is ignoring a huge learning opportunity. Koutsoupidou and Hargreaves (2009) suggest that creativity can enable children to develop decision making and problem solving skills. This development of children's creative thinking is a key element of the Curriculum for Excellence and the use of Games Based Learning can be one way to try to foster this. The challenge is to educate ourselves, children and their parents to understand computer games, the skills used to

complete them and the learning taking place whilst using them. Learning a specific music term such as 'improvisation' does not help a child to understand its complex meaning. The Wii Music software does go some way to helping them understand this by practice and repetition of their skills.

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9. Appendix

NUMBER ………………………………

	AGREE STRONGLY	AGREE	NEITHER AGREE NOR DISAGREE	DISAGREE	STRONGLY DISAGREE
I enjoy listening to music at home					
I enjoy listening to music at school					
I enjoy playing musical instruments					
I enjoy singing					
I enjoy music lessons in school					
I think music is an important subject in school					
I think music lessons will help me when I grow up					

Likert: Teacher Script

TO ENSURE DATA RESULTS ARE AS ACCURATE AS POSSIBLE PLEASE FOLLOW THE SCRIPT AS CLOSELY AS YOU CAN

(DO NOT INDICATE THAT THIS IS FROM MISS RICHARDS IN ANY WAY)

SCRIPT

We are going to fill in a short questionnaire about music. When I bring round the sheets please <u>do not</u> put your name on them. Look at the sheet and wait for me to give instructions
(Give out sheets)
First look at the top of the sheet. I will give each person a number. When I say your number put it clearly on the dotted line at the top of the page.
(Give all numbers and check to make to sure they are in the right place. Make sure there are no names on sheets)

Now lets look at the top line. I will read the words and you follow. Agree strongly, agree, neither agree nor disagree, disagree, strongly disagree. Under each statement you can see a picture.
(Explain the terms if needed)

Now I will read the statements written down the left hand side. Do not mark your paper yet (read each statement once only)

Now look at the pictures of the faces. (Describe each face as you point them out across the page)

Now I am going to read each statement again. When I read each statement I want you to think carefully about which face fits you best. For instance, I enjoy listening to music at home. If you agree strongly that you like listening to music at home then put a mark in the first box which shows Agree Strongly and a thumbs up. If you disagree strongly and don't like listening to music at all at home then put a tick next to the two thumbs down picture. Remember it could be all types of music. Think of the different types you listen to at home. Now put your tick in your chosen box

Continue with all other questions. Check the children have understood each question and have put a tick in one box

Well done . Now we have finished all questions. I want you to check one more time that you have put your number clearly at the top and you have marked with a tick

Collect all papers and put back into the polythene pocket ready for me to collect.

THINGS TO REMEMBER

- Don't let the children know the sheet is from me or for me.
- Don't guide them to any answer in particular, for instance by indicating how music might be useful, or giving an opinion as to why music is important
- Remind them to be honest – if they really don't like something then say so
- You can explain the meaning of agree / disagree further if needed

Thanks everyone !! There will be a second one of these (exactly the same) in April 2010.

In the meantime if you have questions please ask.

A rough idea of the statements is:

Agree strongly – you love it – one of most important things in life

Agree – you like it but there may be other things you like much more,

Neither agree nor disagree – you don't mind – its OK

Disagree – You don't like it but there may be other things you feel stronger about

Strongly disagree – you hate it – you think the statement is completely wrong (or right) in all ways

10. Information for Teachers/...

The Games

Handbell Harmony

This section allows the children to play virtual handbells. The handbells can be used in various ways with groups of up to four children. The handbells allow children the opportunity to see how pitch is organised within music. They allow the player to achieve an individual score, thus allowing some element of self assessment and peer group assessment with those not taking part in the performance. An added advantage here was the realisation that they may be able to improve their own scores by following playing and practising alongside them. What a great discussion we had on the subject of 'practice makes perfect'. Songs are a mixture of both triple and quadruple time allowing the opportunity to discuss the effect of different time signatures. The game can be played at different tempi and with or without complex notes such as accidentals.

Open Orchestra

This is a game aimed primarily at following a beat, putting children in control of a virtual orchestra to create a full performance. This, like Handbell Harmony gives children an individual score at the end.

Pitch Perfect

This game deals with various aspects of pitch including high, low, harmony and also the relationship of major and minor tonality. It has a number of levels increasing in difficulty. The score is given for a group performance; up to four can play at one time.

Exploring Wii Music

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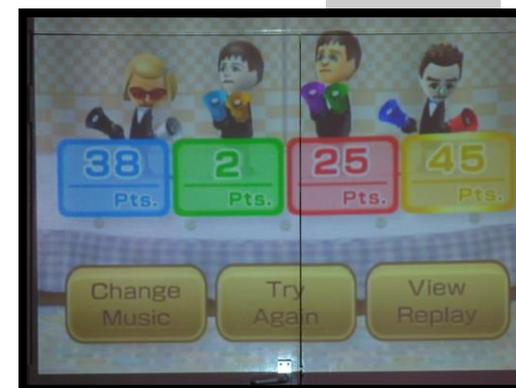
By Vanessa Richards

The Project

The Nintendo Wii is very much aimed at the home gaming market. Some programmes, however, could be used equally as well in an educational setting. Within the area of music alone there is not only Wii Music but also Guitar Hero (in various guises), Band Hero, Boogie, DJ Hero, Just Dance, High School Musical, Rock Band, Samba d'Amigo and The Beatles:Rock Band. Some games are specifically designed for older children and care needs to be taken when playing and listening to some music with regard to appropriate content. The project was undertaken by Upper Primary age children and therefore Wii Music seemed an ideal programme.

The programme is simple to set up and use with a reasonable cost of both hardware and software. The project was undertaken with the P4-7 age group.

The Software

The Wii Music programme is split into a number of different sections. The following descriptions give some idea of the musical learning that may take place whilst using Wii Music

Lessons

This section explains how to play each instrument and gives the children opportunities to practise on virtual instruments. Although not real instruments it is able to show children a short description of instruments and how they are played. This section can be used as a tutorial for individual children to explore a particular instrument.

Jam

This section forms the main body of the software and allows children to 'jam' as a group. This can be using their own improvised rhythms or by following a given score. The children can choose the setting of their song, save a video and email it to friends or to home. (To access this the recipient must have Wii Music software and an internet connection) Although the children do not get a score based on their performance they are encouraged to appraise their own performance and award themselves a score. It is interesting how children can be very critical, although honest about their own performance. Very few children awarded themselves unreasonable scores.

Videos

This lets the children watch the videos made during the 'jam' sessions. The videos of other groups and classes can also be watched and appraised. The videos can also be shared via an internet link. We are very lucky in Scotland to have the 'GLOW' website which allowed the children to link with other schools and discuss the project successes and challenges although we are not at present able to send video images via the GLOW site.