An investigation into whether there exists a positive relationship between a child's level of extracurricular activity participation and their academic performance

The STeP Journal
Student Teacher Perspectives

Vol 3 (1) pages 92-110

Maeve Mullen
St Mary's University College, Belfast

Abstract
This study was completed in order to determine whether a positive correlation exists between a child's extracurricular activity participation level and their academic performance. The sample population for this particular investigation incorporated 165 subjects, 83 females and 82 males. The subjects consisted of Primary 7 pupils aged 130.6 ± 3.0 months. These individuals attend six primary schools across Northern Ireland, in both rural and urban environments. In order to record extracurricular activity participation levels the children completed a questionnaire. The questionnaire provided information concerning the extent of weekly engagement in extracurricular activities as well as the types of activities participated in. Academic performance was recorded through the use of standardised scores. The host teachers provided the Progress in Mathematics (PIM) and the Progress in English (PIE) scores from the last time of testing (end of Primary 6). An average score of 100 was employed with a deviation of 10% to illustrate overachievement and underachievement. Once the data was correlated, the results were presented in a variety of graphical forms for ease of interpretation and analysis. The benefits of extracurricular activity participation are vast. While many researchers highlight the positive effect which engagement has on academic performance, the study did not suggest a strong correlation between the variables examined. After completing a Spearman's Rank Correlation Coefficient Test on the data presented, the conclusion can be made that there was a strong negative correlation between physical activity participation and academic achievement. Further research is required within this field in order to determine a final outcome.

Key Words
Extracurricular activities; Physical activity; Academic performance; Standardised scores; Progress in English (PIE); Progress in Mathematics (PIM).

Introduction
Background to the study
Education within Northern Ireland is renowned worldwide for its excellence. The aim of the Revised Northern Ireland Curriculum (CCEA, 2007) is to equip all young people with the skills to function efficiently and effectively within community. A holistic approach is adopted within schools which focuses not only on the academic development of the pupils but rather on the development of the whole person, for the good of society (CCEA, 2007). Effective child development is therefore crucial in shaping individuals who will benefit the community.

However, classroom time represents only a small window of opportunity for developmental learning (Marshall & Rowland, 2004). Extracurricular participation creates abundant informal learning opportunities within and outside of the school environment (Brooks, 2007). These experiences allow

Citation
Mullen, M. (2016) 'An investigation into whether there exists a positive relationship between a child's level of extracurricular activity participation and their academic performance', *The STeP Journal*, 3(1), pp.92-110.

pupils to apply the knowledge which they have assimilated in class and accumulate new concepts of democratic life (Massoni, 2011).

Participation in extracurricular activities has been associated with numerous developmental benefits. Extracurricular activities assist development by providing opportunities for identity exploration, for establishment of social networks of friends and adults and for learning additional skills that extend beyond academic achievement (Feldman & Matjasko, 2005). The supervised environment provided during engagement establishes discipline and self esteem which are deterrents of antisocial behaviour (especially alcohol use) among youths (Massoni, 2011; Fredricks & Eccles, 2006). Many researchers particularly link participation to greater school attachment; higher academic aspirations; improved academic performance and reduced premature school drop outs (Trudeau & Shepard, 2008; Darling, Caldwell & Smith, 2005).

The Northern Ireland Curriculum (CCEA, 2007) advocates the establishment of a school's extracurricular programme in providing opportunities for holistic development. Due to the evident benefits of participation, extracurricular opportunities have expanded greatly within schools in Northern Ireland. Activities cover a broad spectrum, aimed at catering for an extensive range of interests.

Need For Study

Many researchers have conducted studies into the relationship that exists between extracurricular activity participation and academic performance. Darling et al (2005) particularly focused on the effects which physical activity participation has on participant's attitudes towards school and their academic performance. Darling et al (2005) measured the attitudes which 3,761 American high school students held towards school. The results indicated that those individuals involved in extracurricular sport held more positive attitudes towards school than those who did not engage. The investigation also highlighted that young athletes held higher academic aspirations than their non-participating peers and that there was a positive correlation between increased engagement time and higher aspirations existed. The study concluded that physical activity participation increases the effort which young people exercise academically. While this provides evidence of a positive relationship between extracurricular activity participation and academic performance, results in this area to date have been inconclusive and further research is required. Within Northern Ireland there exists a need to address the wide gap between highest and lowest achieving pupils (DENI, 2011). Currently around 20% of those leaving school are performing below the expected level in literacy and numeracy (DENI, 2011). This in turn leads to disadvantage and poverty of opportunity (Northern Ireland Audit Office, 2013). Further research within this field could prove instrumental in improving academic performance within Northern Ireland.

Aims and Objectives

The aim of this study is to investigate the relationship between pupil extracurricular activity participation and academic performance. The objective is to establish whether a direct positive correlation exists between these two variables.

In order to complete this investigation information will be correlated from a sample population of Primary 7 pupils. The pupils attend six different primary schools across Northern Ireland. There will be a total of 165 subjects; 83 females and 82 males. Information regarding extracurricular activity participation will be collected using a questionnaire which the pupils complete independently. In order to assess academic performance standardised scores for Progress in Mathematics (PIM) and Progress in English (PIE) from the last point of testing (Primary 6) will be collected from the class

teachers. A standardised score of 100 will be employed as an average score, with a 10% deviation either side to indicate overachievement and underachievement.

When the relevant data has been correlated the information will be entered into an Excel document. The results will be interpreted and analysed and presented in a range of graphic notation. These results will then be examined against the aim of the study; to investigate the relationship between pupil extracurricular activity participation levels and academic performance.

Review of Literature

Children's Academic Performance

When studying the statistical analysis of academic performance within Northern Ireland, it can be observed that academic attainment is advanced. Academic performance is calculated through the use of Standardised Tests. Standardised Tests are employed within primary schools as a form of evaluative assessment. These National Curriculum Assessments in 'Communications in English' and 'Using Mathematics' are evaluated by CCEA at the end of Key Stage 1 and Key Stage 2. Children are awarded a level based on their performance in the exams. Pupils who are at the end of Key Stage 1 are expected to achieve a level of 2 while pupils at the end of Key Stage 2 are expected to gain a level 4. Results from these tests are used to assess academic attainment and assist curriculum planning and development (CCEA, 2013).

During the academic year 2013/14, 91.1% and 92.2% of Key Stage One pupils achieved Level 2 or above in 'Communications in English' and 'Using Maths' respectively (DENI, 2015). Similarly, at Key Stage 2, 79.8% and 80.3% of pupils achieved Level 4 or above (DENI, 2015).

Globally, Northern Ireland's academic performance is considered among the best. In the 'Progress in International Reading Literacy Study 2011 (PIRLS)' Northern Ireland was out performed by only four of the forty-five participating countries. It was also very successful in the 'Trends in International Mathematics and Science Study 2011 (TIMSS)', ranking sixth out of fifty countries (TIMSS and PIRLS International Study Centre, 2015).

This success can be linked to the Revised Northern Ireland Curriculum, introduced in 2007. It forms the initial stage for planning a curriculum which adheres to the needs and academic development of individual children (CCEA, 2007). This concept of a child-centred classroom has been developed on the romantic ideas of John Dewey (1859-1952). Dewey advocated that the child should form the focus within the classroom, with the teacher taking a less prominent role within the learning process (Dewey, 1916).

The underpinning aim of the Revised Curriculum draws similarities with Dewey's perspectives on the need to develop each child as an individual and not solely academically (Dewey, 1916). It aspires to empower young people to develop their potential and to make informed and responsible choices and decisions throughout their lives (CCEA, 2007). This holistic, functionalist approach has been adopted by schools in an effort to develop children as individuals, as contributors to society, and as contributors to the economy and environment (CCEA, 2007).

The Revised Northern Ireland Curriculum highlights six areas of learning – Language and Literacy, Mathematics and Numeracy, The Arts, The World Around Us, Personal Development and Mutual Understanding and Physical Education. Establishing cross curricular links is extremely significant in enabling children to transfer skills/information learnt in one aspect of the Curriculum to another.

These transferable skills are essential for understanding; for producing lifelong learners and for preparing young people for life in a rapidly changing society (DENI, 2009).

As an initiative to produce lifelong learners and raising academic standards, teachers have become facilitators to the learning process, rather than providers (Bruner, 1961). A greater awareness of how children 'absorb, process, comprehend and retain information' (visually, verbally and through actions) has led to a classroom environment which caters to the needs of the individual child. Children thrive in environments where learning is interactive, practical and enjoyable (CCEA, 2007; Dewey, 1916; Rousseau, 1974). Drawing on these developments, active and explorative learning have become backbone elements in a stimulating classroom environment. These techniques cater to visual, auditory and kinaesthetic learners alike. Activities must be engaging and motivating as it is only through enjoyment that learning is sustained for the rest of one's life (Cowan, 2006).

Assessment is critical in improving pupil learning, raising academic achievement and improving programme effectiveness (Stiggins, 2008; Webb, 2002). 'Progress in English' and 'Progress in Mathematics' tests are completed at the end of each academic year (beginning in Primary 3) to assess pupil development. Results from these tests are used to develop targets for the coming year. Formative assessment develops part of the everyday teaching and learning process within a classroom (CCEA, 2013). A variety of assessment techniques are used by the teacher to assess each child's development. These techniques can adopt the form of verbal feedback through observations and discussion as well as through written mediums. One such approach would be the use of W.A.L.T (We Are Learning To) and W.I.L.F (What I'm Looking For). These approaches, in connection with success criteria provide children with meaningful and challenging targets (DENI, 2011). While teacher assessment is essential for planning and improving student learning, peer and self assessment is imperative in developing the analytical and evaluative skills of each individual child. These skills are important in preparing young people to work efficiently and effectively within society.

However, there is still substantial room for academic improvement, especially in tackling the wide gap between highest and lowest achieving pupils within numeracy and literacy (DENI, 2009).

Many factors contribute to academic underachievement within Northern Ireland (Combat Poverty Agency, 2003). Lack of parental support or knowledge; social, emotional and behavioural difficulties and lack of educational resources illustrate a proportion of the web of factors which can lead to underachievement (Combat Poverty Agency, 2003).

One of the most significant factors contributing to underachievement is economic and social disadvantage (DENI, 2009). In the 2013/14 Key Stage Two Assessments, 65.1% of 'Free School Meals Entitled (FSME)' pupils achieved Level 4 or above in 'Communications in English', in comparison to 86.2% of non-FSME pupils. Similarly in 'Using Maths' 65.6% of FSME pupils and 86.8% of non-FSME pupils achieved level 4 or above (DENI, 2015). This can be linked to children from less affluent families having a lower attendance rate within schools due to a lack of parental support and poor health care provision (Veritta, 2008).

Gender also plays a significant role in academic underachievement within Northern Ireland. Females outperform males each year. Males leaving school tend to be less qualified than females and are less likely to progress to higher education. In 2013/14, 83.4% of female school leavers gained at least five GCSEs at grade C or above, in comparison to 74.1% of males (Gender Equality Statistics, 2015).

'Every School A Good School', a policy for school improvement (DENI, 2009) was introduced to help raise standards and tackle educational underachievement. It highlighted the characteristics of a successful school as child-centred provision, high quality teaching and learning, effective leadership and a school connected to its local community (DENI, 2009). With a fifth of pupils leaving primary school performing below the expected level in literacy and numeracy it is evident that strategies are needed to tackle the barriers to learning, enabling each learner to fulfil their full potential (DENI, 2009).

Extracurricular Activity Participation

Massoni (2011) identifies 'extracurricular activities as those activities that students participate in that do not fall into the realm of the normal curriculum of schools.' Most schools within Northern Ireland offer some form of extended services through a combination of voluntary effort, parental contributions and alternative sources of external funding (Extended Schools, 2010). The range of activities available include breakfast clubs, after-school clubs and summer schemes; study support; play and recreation; sport and fitness classes; drama; music; ICT, cookery and language lessons and arts and crafts (Extended Schools, 2010). These resources extend the learning environment and reflect the holistic development of the child, in connection with the Revised Northern Ireland Curriculum (Massoni, 2011).

Participation in extracurricular activities is important for exploring one's identity and personal development (Guevremont et al, 2014). Children are given the opportunity for expression and gain rewards for their perceived strengths. This is instrumental in improving self confidence and self efficacy (Bandura, 1977). Both self-expression and self-confidence are important for the developing child (World Health Organisation, 2011). By participating in activities, students gain lessons in leadership; teamwork; organisation; analytical thinking; problem solving and time management (Massoni, 2011). These lessons are important in developing competences which will be carried into adulthood (Little, 2005).

Peer interaction through extracurricular activity engagement provides opportunities for social development (Gardner et al., 2008). These experiences lead to the extension of social and emotional skills which help reduce social anxiety and stress (Metsapelto & Pulkkinen, 2014; Daley & Leahy, 2003). Participation in teamwork provides children with opportunities to explore social norms and characteristics which are essential for future working life within society (Bailey, 2006). Sports Northern Ireland (2009) promotes the strength of participation in equipping 'individuals with transferable knowledge, understanding, skills and attitudes to enable them to make a positive contribution to society'.

Another positive aspect of participation in extracurricular activities is the child developing a supportive relationship with an adult mentor. This interaction develops the child's experiences of respect and trust, encouraging healthy adult connections (Gardner et al, 2008). Positive role model relationships can be linked to the enhancement of school related adult attachments (Massoni, 2011). These positive attachments are instrumental in creating a supportive and caring environment which is essential for academic development.

Massoni (2011) identifies reduced behaviour problems in extracurricular participants. Stead & Neville (2010) found this statement to be particularly evident in those children who participate in sporting activities. This can be linked to the prominent development of discipline skills within sport engagement. Participants are rewarded for their good behaviour; developing better self respect, self esteem and self confidence (Massoni, 2011). This is supported by research from the World Health

Organisation (2011) who found that young people who participate in sport demonstrate lower rates of anti-social behaviour.

Reduced behaviour problems are beneficial within a classroom environment. Fredricks and Eccles (2006) links participation to greater school engagement and increased educational aspirations. These characteristics are in turn associated with improved academic achievement (Metsapelto & Pulkkinen, 2014; Fredricks & Eccles, 2006; Barber et al, 2001; Larson, 2000).

In our commercialised society, where technology plays a major role, children's sedentary behaviour is advanced (World Health Organisation, 2004). According to the Department of Health (2010), UK youths spend between 420-460 minutes per day in sedentary behaviour. A positive aspect of extracurricular participation is its ability to increase physical activity levels of young people. Poor physical fitness levels and unhealthy lifestyles are leading to more children suffering from obesity. Sports Northern Ireland (2009) highlights that, 'In the period 1997-2004, the incidence of overweight or obese boys has increased from 13% to 19% and among girls has risen from 20% to 27%.' The promotion of a healthy lifestyle and increased physical activity levels through extracurricular participation is important in reducing childhood obesity and improving the health of the nation.

While the benefits of extracurricular activities are extensive, there are a number of disadvantages to extracurricular participation. Extracurricular activities demand time and commitment which may leave children feeling overworked and stressed (Larson et al, 2006). Friction between academic demands and extracurricular participation can lead to tiredness, resulting in absentees from school and reduced academic development. Another disadvantage is the cost of certain extracurricular opportunities. Smith (2008) highlights the unfair advantage of those of a higher economic status within extracurricular participation. Pressure from parents and poor quality role model coaches can also have a detrimental effect on the development of a child (Eccles & Barber, 1999). If those adults in charge are emotionally too hard on participants it can deteriorate the element of fun which should be the focus of extracurricular participation.

The correlation between academic performance and extracurricular activity participation

There has long been an interest on the impact that extracurricular participation has on academic performance. Much of this research favours participation in promoting effective academic development and attainment (Singh et al, 2012; Trudeau & Shepard, 2008; Taras, 2005). For academic benefits, activities do not need to be directly related to curriculum material (Marsh & Kleitman, 2002). Reeves (2008) identifies that students who take part in three or four extracurricular activities perform significantly better academically than their peers who engage in none.

A number of studies have been carried out which focus on the positive correlation between academic attainment and participation in physical extracurricular activities (Stead & Neville, 2010). Research carried out by Chaddock et al (2012) emphasises that those children who are physically fit have improved brain function, higher academic achievement scores and superior cognitive performance compared to less fit children. Booth et al (2013) drew similar conclusions conveying that greater impact on test results was observed in those who participated in more intensive exercise. Regular exercise is important in improving elements of cognition and performance (Hillman et al, 2008). Exercise stimulates brain plasticity which encourages the growth of new nerve connections between cells (Schinder & Poo, 2000). This process is critical in learning and memory retention. As heart rate increases during exercise, oxygen saturated blood is pumped to the brain. This in turn aids the release of hormones which facilitate the growth of brain cells. These factors play a significant role in the enhancement of information attainment and academic development.

Studies reflect a strong positive correlation between participation in music and academic performance. Music enhances working memory and thinking skills, contributing to academic development (Pallesen et al, 2010; Rauscher, 2000). Participation in other activities such as arts and crafts and the performing arts facilitate in the development of academic working skills – persistence, concentration and carefulness (Metsapelto & Pulkkinen, 2014). These skills are all prevalent in aiding academic achievement.

Extracurricular activities are important in the development of the child holistically. Through participation, children are able to demonstrate their strengths. The rewards and incentives which they receive are instrumental in building self esteem, which can be an indicator of academic performance (Massoni, 2011). Cosden et al (2004) reported the positive effect that self esteem building activities have on academic goals. Improved self esteem and the development of social skills through extracurricular participation provide children with the confidence they need to become more involved in school life. As a result they develop positive affiliations with school which is linked to academic advancement (Gutman & Feinstein, 2008).

Participation in extracurricular activities can be directly linked to improvements in the psychological health of young people. Engaging in physical activities increases the levels of the neurohormones, norepinephrine and endorphins, which act to reduce stress (Winter et al, 2007). This reduction in stress aids learning and memory which impacts academic performance.

Regular school attendance is an important indicator of academic achievement (Rothman, 2001). Students must be present in school to reap the rewards of the curriculum. The positive affiliation with school life and improvements in health which are evident through participation in extracurricular activities has an encouraging effect on attendance (Darling et al, 2005; Olson, 2008). Olsen (2008) particularly identifies that those children who engage in fine arts activities have a substantially lower absentee rate than those who do not.

The positive effect which extracurricular activity engagement has on children's academic achievement is extremely pronounced for disadvantaged children. The 'Extended Schools Programme' was introduced in 2006 as a measure to improve academic achievement and enable each child to realise their full potential (DENI, 2010b). Since it was introduced over £100 million of funding has been provided to improve extracurricular opportunities for socially disadvantaged communities (Extended Schools, 2012). In almost 90% of participating schools, the benefits of the programme have been tremendous, both in terms of academic and personal growth of its participants (DENI, 2010a). Benefits which were recorded included 'improved behaviour, greater engagement in learning and improved personal and social skills for the children in terms of motivation, aspiration, attendance and self-confidence' (DENI, 2010a). In one case, an increase of 45% of students achieved grades A*-C in five or more GCSE subjects from 2004 to 2009. Suspensions also declined greatly from 52% in 2003/4 to 10% in 2008/9 (DENI, 2010a).

To conclude, there is a well developed body of research into the psychological and social effects which engagement in extracurricular activities can have on academic achievement. The study for this particular research document will focus on adding to this wealth of research and determining whether there exists a relationship between extracurricular activity engagement and academic performance.

Methodology

Research Design

Research is a systematic investigation to find answers to a problem (Burns, 2000). Research methods provide the means by which data is gathered and analysed within a research study (Hammond et al., 2013). Methods are often discussed as being either quantitative or qualitative in nature.

Quantitative research is focused on the collection and analysis of data in numerical form (Blaxter et al, 2001). The mathematical method of statistics is particularly favoured when analysing the collected data (Yilmaz, 2013). Statistical data lends itself to portraying a summary of the major patterns identified within the data (Patton, 2002). Quantitative methods are beneficial when completing research which incorporates a large sample size, as is evident within this particular study. One major advantage of this particular method, identified by Yilmaz (2013) is that it allows the investigator to measure the responses of a number of participants to a limited set of questions, aiding statistical analysis.

Qualitative research is research where the data is not in the form of numbers (Punch, 1998). Brewer (2003) emphasises its focus on quality in favour of quantity. Qualitative research provides a wealth of detailed information and an insight into the participants' personal experiences. Qualitative findings are longer, more detailed and variable in content than quantitative findings (Yilmaz, 2013). Yilmaz (2013) favours qualitative data to quantitative as the latter does not allow respondents to describe their feelings, thoughts and experiences in their own words.

The choice of research methodology is dependent upon the research questions (Onwuegbuzie & Leech, 2005). This particular study incorporates both quantitative and qualitative methods. Hammond et al (2013:108) advocate the use of both methods within a single study as 'it provides confirming, complementary and contrasting sources of data.' The questionnaire used to test levels of extracurricular participation incorporates both qualitative and quantitative data while the standardised test scores used to assess academic achievement uses quantitative data. The two methods complement each other well with written experiences presented in the questionnaire providing meaning to the test statistics. The nature of the questionnaire and the standardised scores was particularly effective as the sample population was vast.

Subjects

Within this study there are 165 subjects; 82 males and 83 females. The sample size is composed of Primary 7 pupils, ranging from the age of ten to eleven. The subjects span six different primary schools across Northern Ireland, both in urban and rural settings.

Procedures

In order for ethically appropriate research to be called out, a number of procedures must be in place. For research to be ethical the purpose of the research; who it benefits and how it is reported must at all times illustrate respect to those involved in the process (Wellington, 2015). In accordance with the Code of Ethics and Conduct (BPS, 2014) researchers must ensure that the consent of each participant is obtained before data is collected. As the information gathered is potentially sensitive and the participants are young children, the risks involved are greater (BPS, 2014). Firstly, it is essential that that consent of the principal and participating teachers is obtained. A letter detailing comprehensive information about the research and informing the principal of what the data gathering will entail was delivered to the school. With the permission of the principal, parents of the desired pupils received a consent letter. In order to obtain consent adequate details of the research must be provided to participants (BPS, 2014). The letter outlined the purpose of the study; the personal details of the researcher and the anonymity of the research. The signing of the attached content form by parents ensures the consent of the young participants. Having collected the completed consent forms the data collection process can commence.

Test

In order to complete the research process, two variables were investigated. The first variable is extracurricular participation levels while the second is academic achievement.

Testing Levels of Extracurricular Participation

Blaxter et al. (2001) identify the use of a questionnaire as a tool for data collection. This approach was employed to gather information concerning the amount and types of extracurricular activities which the target population participate in. For consistency and precision and for the ease of the processing of answers, uniform questionnaires were distributed to each participant (Denscombe, 2003). Questionnaires are particularly effective in gathering the desired research as they ask participants direct questions which will allow for quick data analysis (Denscombe, 2003). The use of a questionnaire is particularly appropriate when the sample population is large and spans over many locations (Denscombe, 2003). As the data was being collected in six primary schools across Northern Ireland, the use of a questionnaire was effective in enabling analysis to materialise with relative ease.

Testing Academic Achievement

The standardised tests for 'Progress in English' and 'Progress in Mathematics' were used to assess the participants' academic achievement. The use of standardised scores allows for the tracking of pupil progress and development. Rather than focusing on raw marks, standardised scores place participants on an easily understood scale. This form of recording allows for straightforward comparison of pupils within a small sample size, as well as nationally. Standardised scores take accountability of the ages of pupils comparing a pupil with peers of the same age. A score of 100 forms the average mark within the standardised tests for English and Mathematics. A deviation of 10% about 100 is employed to assess whether pupils are performing above or below average. The teachers from each sample class provided a list of pupil standardised scores in English and Mathematics at the last time of testing (Primary 6).

Statistical Analysis

In order to determine if there is a direct correlation between the subject's extracurricular activity participation and academic achievement, a Spearman's Rank Correlation Coefficient Test was conducted.

Results and Discussion

Introduction

The following section displays the results obtained from the analysis of the data presented by the subjects under investigation. The aim of the study was to investigate the relationship between extracurricular activity participation and academic achievement. As mentioned previously, questionnaires and standardised test scores were employed to collect data concerning extracurricular participation and academic achievement respectively. The information gathered concerning the sample population was correlated and analysed and the relationships evident are presented in a variety of graphic forms throughout this section.

Subject Information

A total of 165 subjects participated in the investigation; 83 female and 82 male. The subjects attend six different primary schools across Northern Ireland, in both urban and rural environments. The sample population consists of primary seven pupils aged 130.6 ± 3.0 months which is equivalent to 10.9 years.

Extracurricular Activities Participation

The data concerning extracurricular activity participation was collected using a questionnaire which the children completed independently. Participation in a total of 287 activities was recorded amongst the 165 subjects. A total of 29 subjects are not involved in any form of extracurricular participation. This can be observed in Figure 4.1 below.

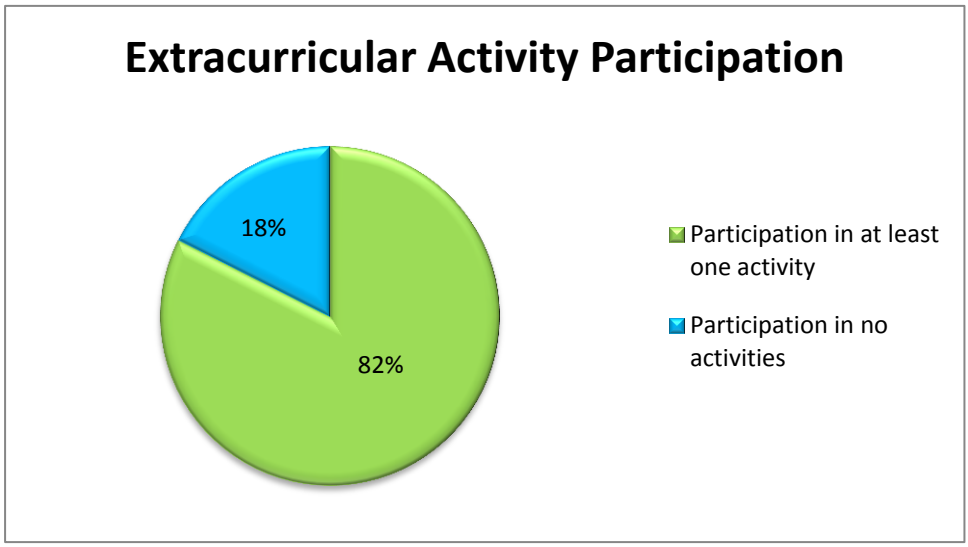

Figure 4.1. Extracurricular Activity Participation.

Of the 287 activities, 189 were deemed as being active. On average each subject is involved in 1.74 activities and 1.15 active activities. It is clear that involvement in physically active sessions is favoured to that of non-active sessions. The dominant activity is Gaelic football with the sample population participating in a total of 90 activities per week. This engagement is equivalent to the vast majority of all the non-active sessions combined, with a deviation of 8 sessions per week. The variety of participation can be observed in Figure 4.2 below. This high degree of participation in physically active sessions is coherent with the research project, 'Keeping Them in the Game' published by the Economic and Social Research Institute in 2013. It examined sports participation among children and young people. The research indicated that during the top two years in primary education, participation in extracurricular sport at school was high for both males and females, at 89% and 86% respectively (Hull et al, 2014).

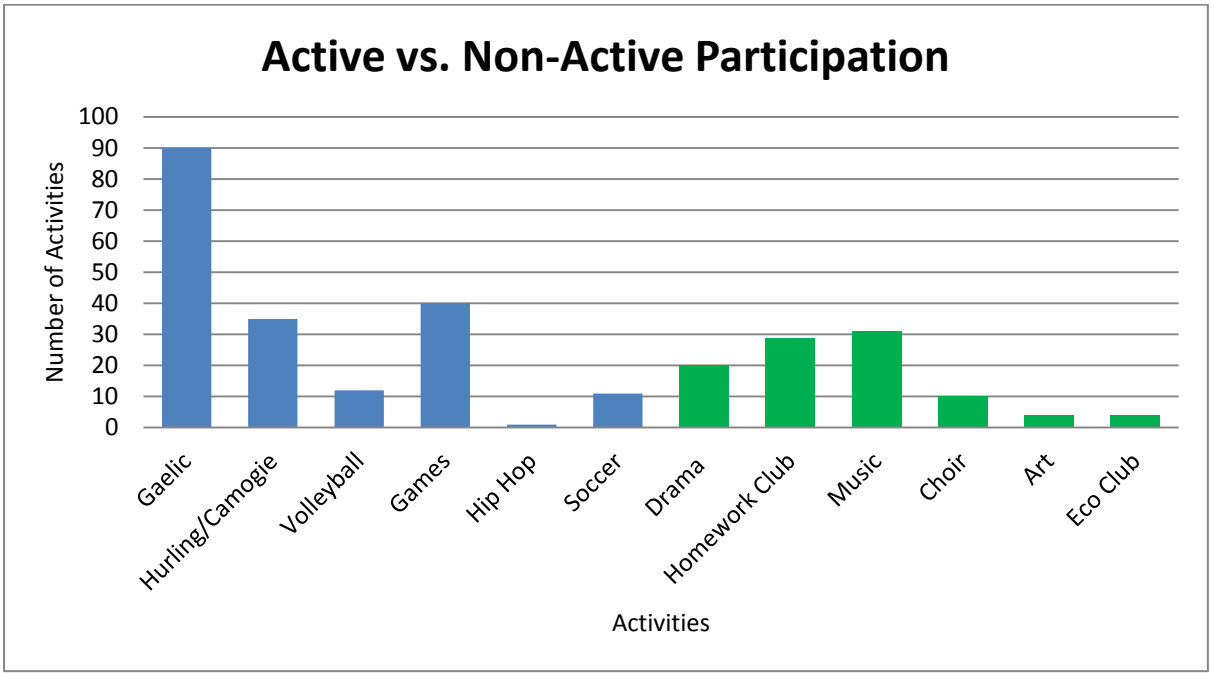

Figure 4.2. Extracurricular Activity Participation (Active vs. Non-Active).

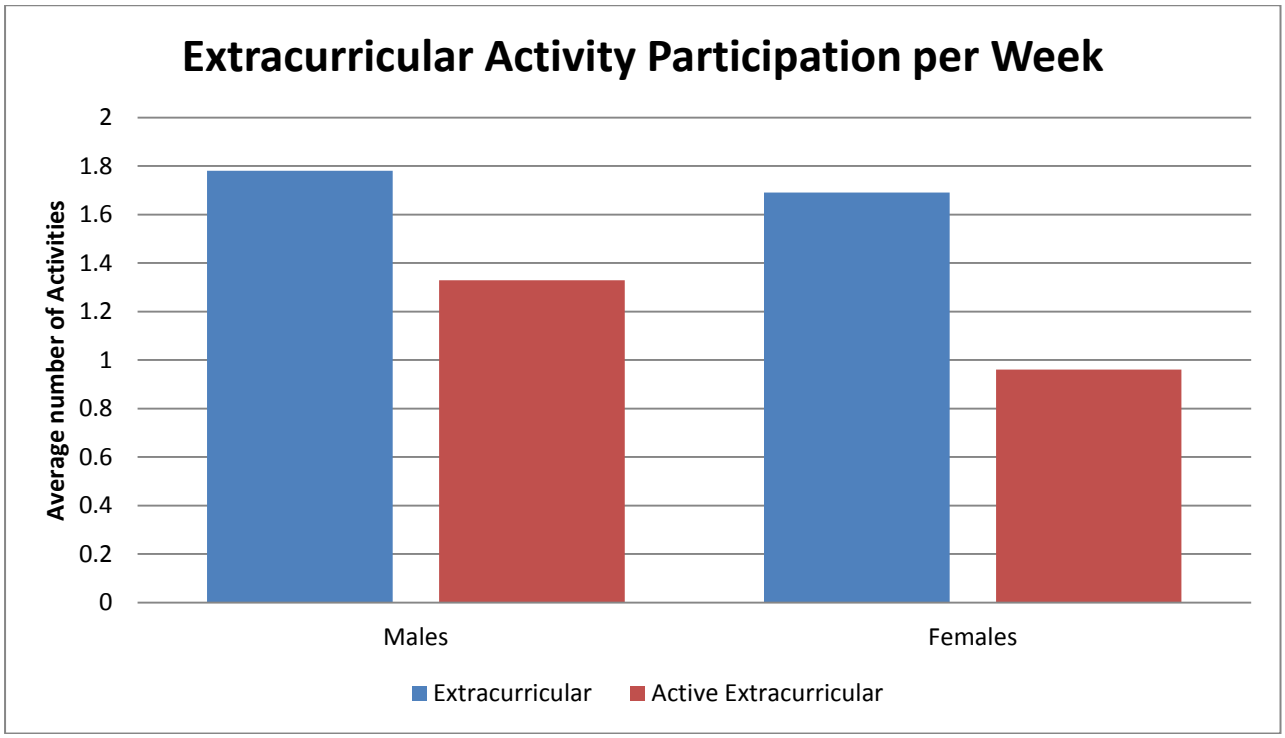

Figure 4.3. Extracurricular Activity Participation by Gender.

From Figure 4.3 it is evident that on average, male subjects engage in more extracurricular activities than their female peers. Per week males undertake 1.78 extracurricular activities, in comparison to females who participate in 1.69 activities. A more noticeable disparity is evident when reflecting on gender participation in active extracurricular activities. On average, males compete in 0.37 more active sessions per week than females do.

Equality within gender participation in active sessions is an issue identified within a number of studies. At all ages males tend to be more physically active than females (Griffiths et al, 2013). This is in connection with research carried out by Hull et al (2014) which highlights the trajectory of females dropping out from sporting activities more than males. This trend continues to adulthood. The research document 'Women and Sport: A Summary of Potential Issues' (Hull et al., 2014) observes this pattern among adult participants with 45% of women participating in sport in the last 12 months, in comparison to 59% of men.

Academic Performance

To evaluate academic performance, standardised scores for the Progress in English and the Progress in Mathematics were collected and recorded. The average score for the 165 subjects in Progress in English was 105.96 while the average score for Progress in Mathematics was 106.23. Both average scores exceeded the mean score of 100 for the standardised testing with performance in mathematics exceeding performance in English. These results can be observed in Figure 4.4 below. This pattern is evident nationally with 80.1% of pupils achieving level 4 in English during the academic year 2008/09 compared to 81.4% achieving level 4 in mathematics (Northern Ireland Audit Office, 2013).

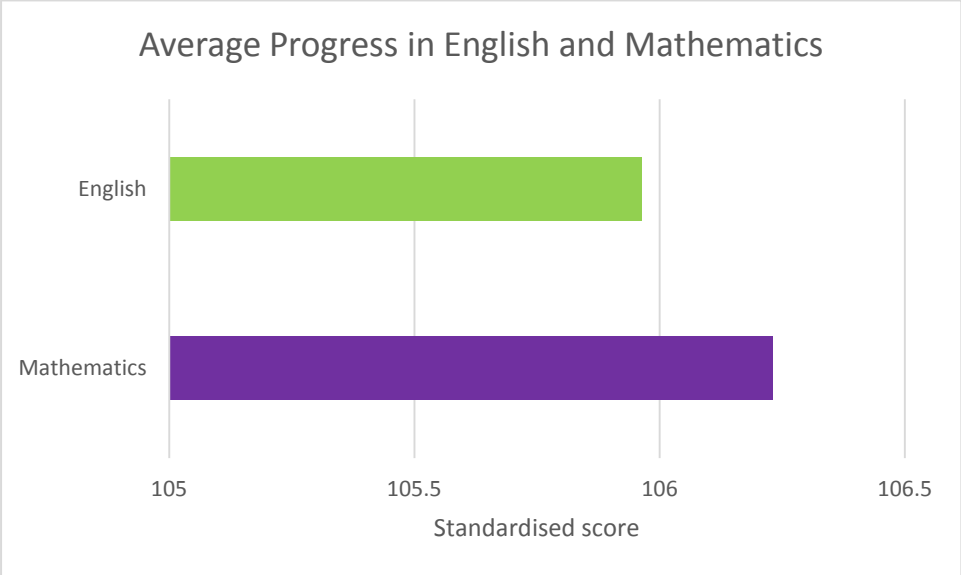

Figure 4.4. Average Progress in English and Mathematics.

Attainment gender gap between girls and boys within Northern Ireland is a substantial concern. The Equality Commission Northern Ireland (2008) identified education as one of the six areas where inequalities exist. Figure 4.5 below details the Progress in Mathematics and Progress in English by gender of the participants.

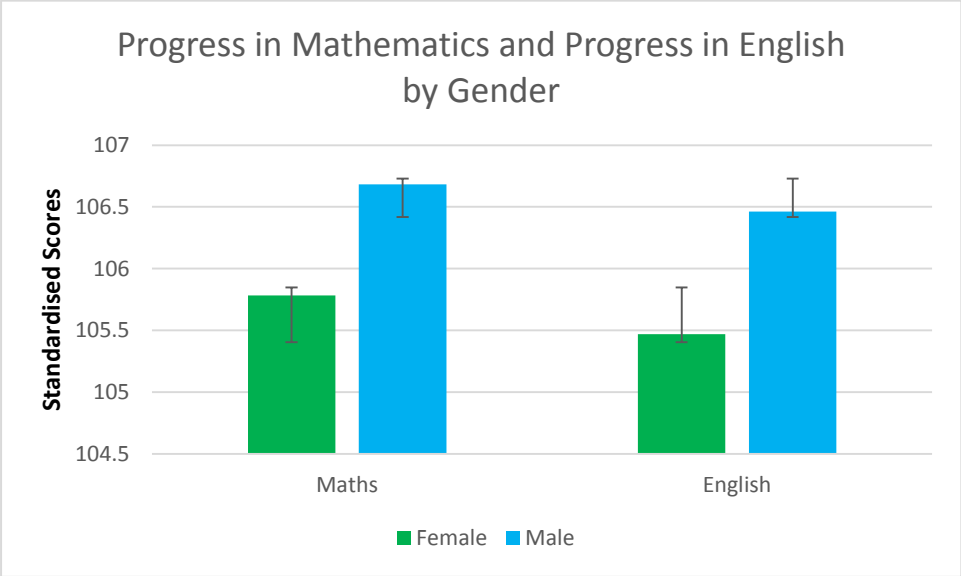

Figure 4.5. Progress in Mathematics (PIM) and Progress in English (PIE) by Gender.

Table 4.1. Range and Mean scores for PIM and PIE by gender.

	Female PIM	Female PIE	Male PIM	Male PIE
Highest Score	141	140	140	140
Lowest Score	69	70	86	75
Range	72	70	54	65
Mean	105.78	105.47	106.68	106.46

From Figure 4.5 it is clear that males outperform females in terms of both mathematics and English. Females obtained an average score of 105.78 within PIM and a score of 105.47 within PIE. Males obtained 106.68 and 106.46 within PIM and PIE respectively. The error bars (with one standard deviation) illustrated in Figure 4.5 show a large distribution of data for the female participants. This accentuates the fact that the mean score does not closely reflect the true values. This can be observed from Table 4.1 which shows the large range of data obtained for the female population (72 for PIM and 70 for PIE). On the other hand, the error bars illustrate a small range of data for the male participants. This emphasises the small deviation of data around the mean value. From Figure 4.5 we can conclude with confidence that there is a significant difference between the scores obtained by female participants from male participants, both in terms of English and mathematics.

These results contrast the gender inequality figures within Northern Ireland education which statistically favour females. In 2011/12, 87.6% of females achieved Level 4 or above in English, compared to 78.3% of males (Burns et al, 2015). In terms of mathematics, in 2011/12, 85.7% of females achieved Level 4 of above, compared to 81.7% of males (Burns et al, 2015). This disparity is particularly evident as children progress into secondary level education. The Joint Council for Qualifications (2015) identified that 75.1% of males achieved A*-C grades in the 2015 GCSE examinations, compared to 82.2% of females.

Extracurricular Participation correlated with Academic Performance

Figures 4.6 and 4.7 below display PIE and PIM between the three ability groups within the study (high, medium, low). For the purpose of the analysis of the data, a 10% deviation either side of the average score (100) was employed to separate the subjects' into ability levels.

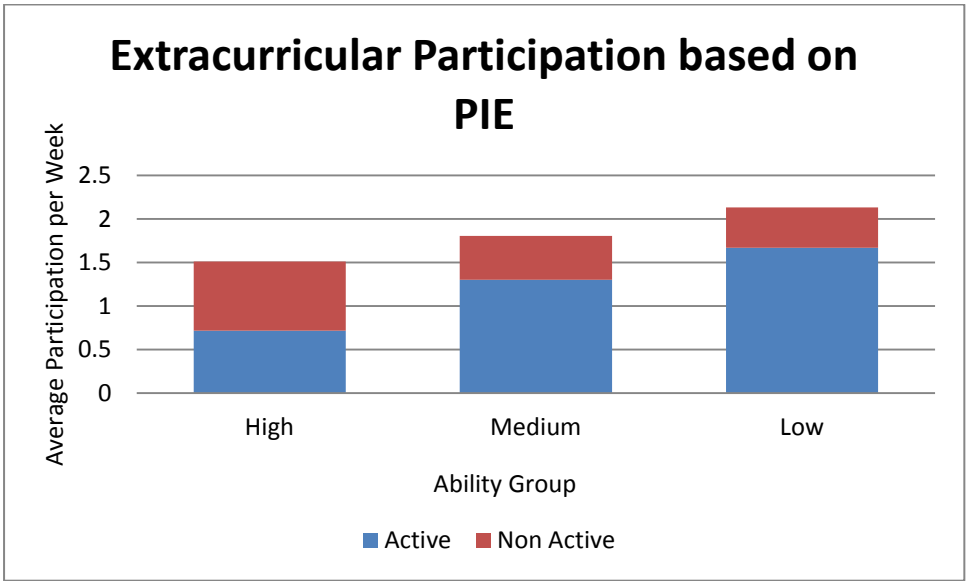

Figure 4.6. Extracurricular Participation based on PIE.

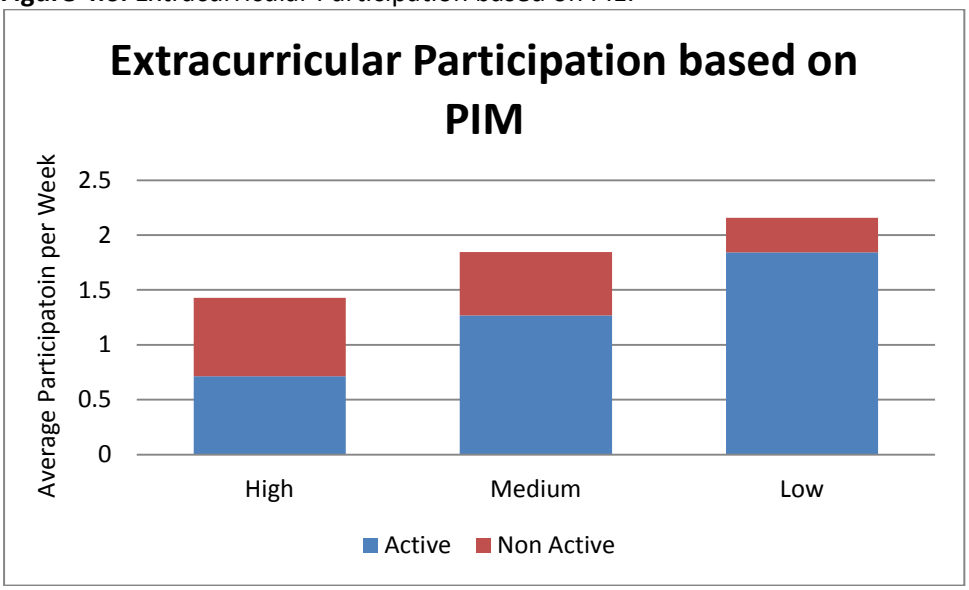

Figure 4.7. Extracurricular Participation based on PIM.

It is evident that in terms of PIE and PIM, the greatest proportion of subjects who participated in active sessions were also within the low ability group. In terms of PIE, participants within the low ability group took part in over twice the amount of active sessions per week than those within the high ability group (1.667 compared to 0.717). This relationship is more prevalent within PIM. Those within the low ability group participated in 1.842 active sessions per week in comparison to those within the high ability group who took part in 0.714 activities. The inverse can be observed with the largest proportion of subjects' participating in non active sessions falling into the high ability group. This is particularly noticeable within PIM where those in the high ability group participate in 0.399 more non active sessions than those participants within the low ability group. These results are surprising as much research highlights the positive relation between academic development and physical activity.

The results contradict recent research carried out by Booth et al (2013) which investigated the relationship between physical activity and academic attainment. The data was collected from a sample population of 4,755 11 year olds in the UK. The data assembled indicated that regular moderate to vigorous physical activity improves adolescents' academic performance. Booth et al (2013) concluded that the more intensive the exercise, the greater the impact is on positive academic development. Kamijo et al (2011) also reported that young people who are more physically active are more productive within class.

The figure below displays both the academic rank and active participation rank of each of the subjects investigated. A Spearman's Rank Correlation Coefficient Test was employed to determine the statistical significance of the data gathered. The subjects' average academic progression in terms of PIM and PIE were ranked against the amount of active extracurricular activities which they participated in per week. The result was R=-0.587 indicating that there was a strong negative correlation between the ranks obtained for academic progress and active extracurricular participation. This implies that the higher an individual ranked in academic achievement, the lower they ranked in active participation and vice versa. This is evident in the dispersed cluster of values between active participation ranks 154 and 164.

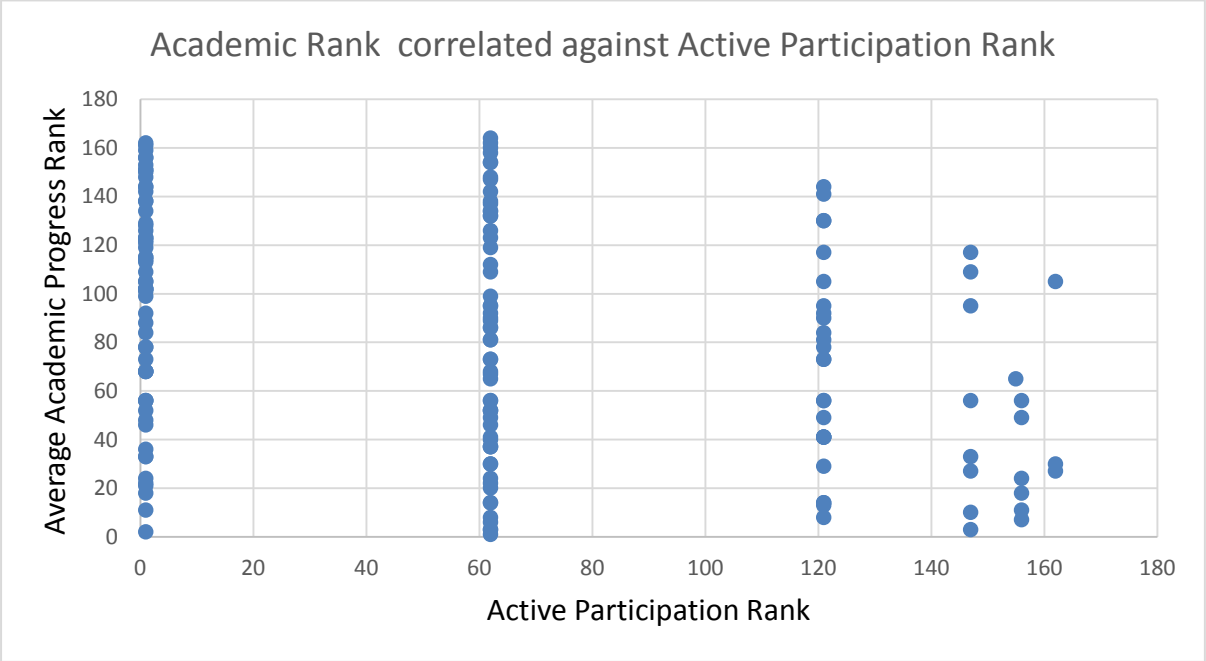

Figure 4.8. Academic Rank correlated against Active Participation Rank.

This result contradicts Trudeau and Shepard (2008) who observed a positive association between physical activity and academic achievement. This beneficial implication was also identified within a review by Singh et al (2012) who concluded that participation in physical activity is positively related to academic performance in children. Overall, the study did not produce evidence supporting the abundant literature which advocates the positive correlation between extracurricular activity participation and academic achievement. However, the results are still of interest and as the study is small scale more investigation is needed to reach a final conclusion.

Conclusion

After extensive research into extracurricular activity participation and its effects on academic achievement, data was collected from a sample population to investigate the relationship between these variables. Quantitative and qualitative research methods were employed to allow for critical

analysis of the data accumulated. The large sample data was then orchestrated into various graphical formats to allow for ease of comparison and analysis. The results of the study indicated that there was no concrete evidence to suggest that extracurricular activity participation impacts academic achievement.

A number of researchers agree that extracurricular activity participation does not have a positive impact on academic performance. Reeves (2008) highlights the negative impact extensive engagement has on academic performance in terms of pupils losing focus on academics. Over engagement results in less time being devoted to homework completion and study. Reeves (2008) also emphasises the psychological issue of over engagement which may lead to fatigue and stress, resulting in an adverse effect on school attendance and performance. However, while the results did not illustrate a positive correlation between the two variables under investigation, they did not demonstrate significant detrimental effects of extracurricular activity participation on academic performance.

Recommendations

Upon reflection of this investigation, a number of recommendations are advisable in order to produce a more reliable study. The appropriate gathering of data for the two variables; 'extracurricular activity participation' and 'academic achievement' is imperative. However, the results for pupils' extracurricular activity participation levels were gathered in the month of November, outside the season for many outdoor activities. Likewise, results were gathered around the date of the Transfer Test. Engagement in studies may have had an influence on pupils' commitment to extracurricular clubs and activities. Therefore results may not demonstrate a true reflection of extracurricular activity participation. Thus, in order to gain a more accurate reflection of the pupils' activity levels, results should have been collaborated over a longer period of time and in warmer months (e.g. March-June).

Limitations

A number of limitations within this study had an effect on the outcome of the results produced. As identified previously, the duration and time of the study had an influence on the pupils' extracurricular activity levels and academic achievement. Gathering data over a longer period of time, preferably six months and during the peak months for school based clubs (January to June), would provide a clearer representation of the amount and types of extracurricular activity participation. This extended study would allow for the analysis of the effects which particular activities have on academic advancement. However, due to the time restraints placed on this study these factors were not possible. In addition, the standardised scores may have limited the study as these were based on scores collected during the latter year of Primary 6. A more accurate comparison with extracurricular activity participation could have been complied if the standardised scores were more recent. Overall there is insufficient evidence to conclude that extracurricular activity participation positively impacts academic achievement. While this is true, there is also no evidence to suggest that engagement is detrimental to academic development. Further extensive research in this field is necessary to determine if a pattern exists between the two variables.

Acknowledgements

I would like to take this opportunity to express my gratitude to those individuals who were instrumental in aiding my completion of this research project. First and foremost I would like to convey a special thanks and utmost appreciation to my tutor and mentor, Dr. Elaine Mc Laughlin. Her support and encouragement were exceptional and we were able to develop a productive working relationship. She was readily available to offer expert advice, support and guidance at each stage of the process. Without her direction and expertise in this particular area I would not have

been able to complete this project to as high a standard. I would also like to thank the entire Physical Education department for their support and guidance throughout this experience. I would like to extend many thanks to the respective schools, principals, teachers and children who participated eagerly within my project. Without their involvement the project would not have materialised and I am therefore very grateful for the prominent role they played within the study. Finally I would like to take this opportunity to thank my fellow colleagues who formed the research group. Without their dedication the results obtained would not be as vast and reliable as they are. I thank you for your efforts and support and it was a pleasure to work alongside a determined group of peers.

References

Bailey, R. (2006) 'Physical Education and Sport in Schools: A Review of the Benefits and Outcomes', *Journal of School Health*, 76 (8), pp.397-401.

Bandura, A. (1977) 'Self-efficacy: Toward a Unifying Theory of Behavioural Change', *Psychological Review*, 84 (2), pp.191-215.

Barber, B. L., Eccles, J. S., & Stone, M. R. (2001) 'Whatever happened to the jock, the brain, and the princess? Young adult pathways linked to adolescent activity involvement and social identity', *Journal of Adolescent Research*, 16, pp.429–455.

Blaxter, L., Hughes, C., & Tight, M. (2001) *How to research* (second edition), Buckingham: Open University Press.

Booth, J., Leary, S., Joinson, C., Ness, A., Tomporowski, P., Boyle, J. & Reilly, J. (2013) 'Associations between objectively measured physical activity and academic attainment in adolescents from a UK cohort', *British Journal of Sports Medicine*.

BPS (2014) Code of human research ethics. The British Psychological Society. Available at: www.bps.org.uk (last accessed on 1st December 2015).

Brewer, J. D. (2003) *Qualitative research, The A-Z of Social Research: a dictionary of key social science research concepts*, Thousand Oaks: SAGE Publications Ltd.

Brooks, R. (2007) 'Young people's extra-curricular activities: Critical social engagement – or 'something for the CV'?', *Journal of Social Policy*, 36(3), pp.417–434.

Bruner, J. S. (1961) 'The Act of Discovery', *Harvard Educational Review*, 31, pp. 21-32.

Burns, R. (2000) *Introduction to Research Methods*, New York: SAGE Publications Ltd.

Burns, S., Leitch, R. & Hughes, J. (2015) *Education Inequalities in Northern Ireland: Final report of the Equality Commission for Northern Ireland*, Belfast: Queen's University.

CCEA (2007) *The Northern Ireland Revised Curriculum*, Belfast: CCEA.

CCEA (2013) *Guidance on Assessment in the Primary School*, Belfast: CCEA.

Chaddock, L., Hillman, C., Pontifex, M., Johnson, C., Raine, L. & Kramer, A. (2012) 'Childhood aerobic fitness predicts cognitive performance one year later', *Journal of Sports Science*, 30(5), pp.421-430.

Cosden, M., Morrison, G., Gutierrez, L. & Brown, M. (2004) 'The effects of homework programs and after-school activities on school success', *Theory into Practice*, 43, pp.220-226.

Cowan, P. (2006) *Teaching Mathematics. A Handbook for primary and secondary school teachers,* Oxford: Routledge.

Daley, A. & Leahy, J. (2003) 'Self-perceptions and participation in extracurricular physical activities', *The Physical Educator*, 60(2), pp.13-19.

Darling, N., Caldwell, L. & Smith, R. (2005) 'Participation in school-based extracurricular activities and adolescent adjustment', *Journal of Leisure Research*, 37(1), pp.51-76.

Denscombe, M. (2003) *The Good Research Guide for small-scale social research projects* (Second Edition), Berkshire: Open University Press.

Department of Education for Northern Ireland (DENI) (2009), *Every School a Good School: A Policy for School Improvement,* Bangor: DENI.

Department of Education for Northern Ireland (2010a) *Education and Training Inspectorate. An Evaluation of Extended Schools,* Bangor: DENI.

Department of Education for Northern Ireland (2010b) *Extended Schools – Building on Good Practice,* Bangor: DENI.

Department of Education for Northern Ireland (2011) *Count: Read and Succeed. A strategy to improve outcomes in Literacy and Numeracy*, Bangor: DENI.

Department of Education for Northern Ireland (2015) *School Development Planning and Target Setting (Primary),* Bangor: DENI.

Dewey, J. (1916) *Democracy and education: An introduction to the philosophy of Education*, London: Macmillan.

Eccles, J. S. & Barber, B.L. (1999) 'Student council, volunteering, basketball, or marching band: What kind of extracurricular involvement matters?', *Journal of Adolescent Research,* 14, pp.10-43.

Equality Commission for Northern Ireland (2008) *Inequalities in Education – Facts and Trends 1998-2008.* Belfast: ECNI.

Feldman, A. F. & Matjasko, J. L. (2005) 'The role of school-based extracurricular activities in adolescent development: A comprehensive review and future directions', *Review of Educational Research*, 75, pp.159–210.

Fredricks, J. & Eccles, J. (2006) 'Is extracurricular participation associated with beneficial outcomes? Concurrent and longitudinal relations', *Developmental Psychology*, 42(4), pp.698-713.

Gardner, M., Roth, J., & Brooks-Gunn, L. (2008) 'Adolescents' participation in organized activities and developmental success 2 and 8 years after high school: Do sponsorship, duration, and intensity matter?', *Developmental Psychology*, 44(3), pp.814-830.

Griffiths, L. et al. (2013) How active are our children? Findings from the Millennium Cohert Study, BMJ Open 2013 (Online).

Guevremont, A., Findley, L. & Kohen, D. (2014) 'Organized Extracurricular Activities: Are In-School and Out-of-School Activities Associated with Different Outcomes for Canadian Youth?', *Journal of School Health*, 84 (5), pp.317-325.

Gutman, L.M. & Feinstein, L. (2008) *Pupil and school effects on children's well-being*, London: DCSF.

Hammond, M. & Wellington, J. (2013) *Research Methods. The Key Concepts*, Oxon: Routledge.

Hillman, C.H., Erickson, K.I. & Kramer, A.F. (2008) 'Be smart, exercise your heart: exercise effects on brain and cognition', *Nat Rev Neurosci*, 9(1), pp.58-65.

Hull, D. & Ward, M. (2014) Women and Sport: A summary of potential issues, *Research and Information Service Research Paper*, Belfast: Northern Ireland Assembly.

Kamijo, K., Pontifex, M. B., O'Leary, K. C., Scudder, M. R., Wu, C.T., Castelli, D. M. & Hillman, C. H. (2011) 'The effects of an afterschool physical activity program on working memory in preadolescent children', *Developmental Science*, *14*(5), pp.1046–1058.

Larson, R. (2000) 'Toward a psychology of positive youth development', *American Psychologist*, 55, pp.170–183.

Larson, R., Hansen, D. & Moneta, G. (2006) 'Differing Profiles of Developmental Experiences Across Types of Organized Youth Activities', *Developmental Psychology*, 42 (5), pp.849-863.

Little, P. (2005) 'Engaging adolescents in out-of-school time programs: Learning what works', *The Prevention Researcher*, 12(2), pp.7-10.

Marsh, H.W. & Kleitman, S. (2002) 'Extracurricular activities: The good, the bad and the nonlinear', *Harvard Educational Review,* 72, pp.464-512.

Marshall, L. & Rowland, F. (2004) *A guide to learning independently*, Maidenhead: Open University Press.

Massoni, E. (2011) 'Positive Effects of Extra Curricular Activities on Students', *ESSAI*, 9(27), pp.84-87.

Metsapelto, R. & Pulkkinen, L. (2014) 'The Benefits of Extracurricular Activities for socioemotional behaviour and school achievement in middle childhood: An overview of the research', *Journal for Educational Research*, 6 (3), pp.10-33.

Northern Ireland Audit Office (2013) *Improving Literacy and Numeracy Achievement in Schools,* Belfast: NIAO.

Olson, C. A. (2008) 'Can music education help at-risk students?', *Teaching Music*, 16(3).

Onwuegbuzie, A. & Leech, N. (2005) 'On becoming a pragmatic researcher: The importance of combining quantitative and qualitative research methodologies', *International Journal of Social Research Methodology, 8(*5), pp.375-387.

Pallesen, K. J., et al. (2010) 'Cognitive Control in Auditory Working Memory Is Enhanced in Musicians', *PLoS ONE*, 5(6).

Patton, M. Q. (2002) *Qualitative Research & Evaluation Methods* (3rd Edition), Thousands Oaks: SAGE Publications Ltd.

Punch, K (1998) *Introduction to Social Research: Quantitative and Qualitative Approaches*, New York: SAGE Publications Ltd.

Rauscher, F. H. & Zupan, M. A. (2000) 'Classroom Keyboard Instruction Improves Kindergarten Children's Spatial-Temporal Performance: A Field Experiment', *Early Childhood Research Quarterly*, 15(2), pp.215-228.

Reeves, D. B. (2008) 'The extracurricular advantage', *Education Leadership*, 66(1), pp.86-87.

Rothman, S. (2001) 'School absence and student background factors: A multilevel analysis', *International Education Journal*, 2(1), pp.59-68.

Rousseau, J. (1974) *Émile*, London: Dent & sons.

Schinder, A.F. & Poo, M. (2000) 'The neurotrophin hypothesis for synaptic plasticity', *Trends Neurosci*, 23(12), pp.639-645.

Singh et al. (2012) 'Physical activity and performance at school', *Archives of Paediatrics & Adolescent Medicine*, 166 (1), pp.49-55.

Smith, S. L. (2008) 'Athletics & Academics'. Research Starters.

Sport Northern Ireland (2009) *The Northern Ireland Strategy for Sport and Physical Recreation 2009-2019*, Belfast: Sport Northern Ireland.

Stead, R. & Neville, M. (2010) *The impact of physical education and sport on education outcomes: a review of literature*, Loughborough: Institute of Youth Sport.

Stiggins, R.J. (2008) Assessment Manifesto: A Call for the Development of Balance Assessment Systems. A position paper published by the ETS Assessment Training Institute, Portland, Oregon.

Taras, H. (2005) 'Physical activity and student performance at school', *J School Health*. 75(6), pp.214-218.

Trudeau, F. & Shepard, R.J. (2008) 'Physical education, school physical activity, school sports and academic performance,' *Int. J Behaviour Nutr Phys Activity*, 5(10).

Veritta, L.B. (2008) *Poverty Alleviation: 21st Century Issues and Challenge:* Nova Publishers.

Webb, N. (2002) Assessment literacy in a standards-based education setting, a paper presented at the annual meeting of the American Educational Research Association. New Orleans.

Wellington, J. (2015) *Educational Research: Contemporary Issues and Practical Approaches*, London: Bloomsbury Academic.

Winter, B., Breitenstein, C., Mooren, F.C. et al. (2007) 'High impact running improves learning', *Neurobiol Learn Mem*, 87(4), pp.597-609.

World Health Organization (2011) *Global Recommendations on Physical Activity for Health: 5-17 year olds.* World Health Organisation.

World Health Organisation (2004) *The World Health Report: Changing History.* World Health Organisation.

Yilmaz, K. (2013) 'Comparison of Quantitative and Qualitative Research Traditions: epistemological, theoretical, and methodological differences', *European Journal of Education*, 48(2).

Internet Sources

Combat Poverty Agency (2003) *Educational Disadvantage in Ireland* [online], Available at: *http://www.combatpoverty.ie/publications/povertybriefings/Briefing14_EducationalDisadvantage_2003.pdf* [Accessed 10/10/15].

Department of Health (2010) *Sedentary Behaviour and Obesity: Review of the Current Scientific Evidence* [online], Availible at: *https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/213745/dh_128225.pdf* [Accessed 20/10/15].

Extended Schools (2010) [online], Available at: http://www.nidirect.gov.uk/extended-schools [Accessed 15/10/15].

Gender Equality Statistics (2015) [online], Available at: http://www.northernireland.gov.uk/news-ofmdfm-300715-gender-equality-statistics [Accessed 15/10/15].

Joint Council for Qualifications (2015) [online], Available at: http://www.jcq.org.uk/examination-results/gcses/2015/gcse-gender-entry-trends-and-regional-charts-2015 [Accessed 20/12/15].

TIMSS and PIRLS International Study Centre (2015) [online], Available at:http://www.timssandpirls.bc.edu [Accessed 15/10/15].