

# dance 4 your life

A dance and health project



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# 1 Executive Summary

In September 2008, North Kent Local Authorities Arts Partnership (NKLAAP) developed *dance 4 your life*, a dance research project. The project was devised with the dual aims of delivering an enjoyable dance programme, and scientifically assessing its impact on the fitness, health, and well being of young people in the NKLAAP region (Local and Unitary Authority areas of Gravesham, Medway and Swale).

The dance programme was delivered by a team of professional dance artists to Year 10 students in five secondary schools, over two terms during 2009. A team of Dance Scientists and Researchers from Laban were commissioned to assess the impact and potential health benefits of this dynamic contemporary dance programme on young adolescents.

Specific physiological and psychological areas of fitness, health and well being were chosen for assessment. Physical assessments included flexibility, upper body strength, and aerobic capacity, and areas of psychological assessment included self esteem (or self worth), intrinsic motivation (or participation in an activity for pleasure rather than external reward), and general attitudes towards dance and group physical activities. Research data was collected by the project team from Laban at the beginning and then again at the end of the programme.

The research findings demonstrated significant increases in physical fitness and upper body strength. Self esteem also increased significantly. Furthermore, participants were found to be very receptive to dance, with high levels of intrinsic motivation at pre-test and post-test stages.

The vital need to encourage young people to participate in physical activity as a tool for greater health and well being is acknowledged at government level and among health professionals. The potential health benefits of dance have also been both anecdotally observed, and demonstrated by previous research in the field. *dance 4 your life* has provided sound scientific evidence in terms of the health benefits of dance, thus contributing to the findings of previous studies in the field, and emphasising further, the essential need for increased and ongoing investment in dance.

## 2 Background and Context

### Partners and Investment

*dance 4 your life* was a participatory dance and health project for young people aged 14 years old which aimed to provide an enjoyable dance programme, whilst also furthering scientific research within the field of dance and health.

The project was developed, led and funded by The North Kent Local Authorities Arts Partnership (NKLAAP). NKLAAP incorporates Gravesham Borough Council, Swale borough Council, Medway Unitary Authority, Kent County Council and works closely with Arts Council England, South East. NKLAAP recruited a part time, freelance Project Manager to co-ordinate the project, supported throughout by NKLAAP.

In order for the scientific research aspect of the project to be initiated and developed, it was critical to engage a partner with expertise in the dance science field. Laban, a recognised and pioneering leader in the area of dance science, joined *dance 4 your life* as the research partner.

### Aspiration and Aims

The *dance 4 your life* project sought to build on previous findings, assessing the impacts of dance on the physiological and psychological well being of participants. It was inspired by a similar programme of research undertaken in 2005/06 by Hampshire Dance and Laban (*NRG Youth Dance and Health Project*) which showed a positive impact on the fitness and wellbeing of adolescent participants following a period of dance classes.

The specific aims of *dance 4 your life* were to:

Develop young people's dance and movement skills.

Provide a supportive, autonomous and enjoyable learning environment.

Encourage participants to be imaginative, creative and individual.

Measure the impact of dance classes on young people's physiological and psychological health and well being.

Assess young people's attitudes towards dance as a physical activity, and their levels of motivation to participate in dance classes.

Investigating the potential health benefits of dance, and underpinning this with scientific evidence was deemed a crucial way of highlighting the further and continued need for investment in dance.

### Structure

The project was delivered during the Spring and Summer term in 2009. Delivery was structured into either a 6 or 10 week programme that consisted of either a 1x 60minute or a 1x 90minute dance class per week. Scientific assessments were carried out on the first and the last days of the programme.

### 3 Research Rationale

The specific elements of physical fitness and psychological wellbeing that were observed in this project have previously been reported to be affected by involvement in physical activity.

**It is well established that physical activity can have a wide range of beneficial effects on health and well being.**

Numerous studies have explored the positive impacts of sports and other physical activities on areas of health, disease prevention, and general well being. Whilst physical fitness is beneficial for all ages, it has also been identified by various studies as a key factor for adolescent health (summarised in a 2006 review of children and adolescent health related fitness assessments)<sup>1</sup>, rendering physically active individuals “less vulnerable to lifestyle related degenerative and chronic diseases.” Moderate to vigorous levels of physical activity are known to “stimulate functional adaptation of all tissues and organs in the body” (i.e. improve physical fitness).<sup>2</sup> Experimental research has also demonstrated specific benefits of engaging in physical activity such as enhanced bone mass in early pubertal children,<sup>3</sup> and positive relationships between physical activity and levels of bone density in adolescence.<sup>4</sup>

Alongside the benefits of physical activity on areas of physiological health, research has demonstrated benefits on areas of mental health and well being. Elderly individuals who undertake moderate regular exercise have improved cognition, and are at less risk of developing dementia, for example. Exercise is being investigated as a “potentially protective factor” in the prevention or delay in the onset of loss of cognitive function.<sup>5</sup> Examinations have also been conducted into the effect of physical activity on depression and anxiety in young people concluding that exercise can improve levels of self esteem in children and young people.<sup>6</sup>

Dance, as a physical activity that may have physiological and psychological benefits remains relatively unexamined. Studies into the physiological demands of dance seem to have mainly examined folk dancing<sup>7</sup> and aerobic dance.<sup>8</sup>

**Positive effects of dance may be frequently discussed anecdotally by dance and education professionals, however systematic research has thus far, been confined in its remit.**

In 2005/06, a research study was undertaken by Laban and Hampshire Dance, commissioned by the Joint Investment Fund for the Arts in the Southampton, Hampshire, Isle of Wight and Portsmouth and Southsea (SHIPS) region. *The NRG Dance and Health Project* investigated the impact of creative dance on specific areas of physical fitness and psychological well-being of school children aged 11-14. Significant findings from this study demonstrated that these creative dance classes increased lung capacity, flexibility and aerobic capacity in all participants, with a statistically significant change for females. Increases were also found in all areas of psychological well-being that were assessed, however these were not statistically significant.<sup>9</sup>



More recent dance initiatives include *Essentially Dance*, a project devised by Darren Bennett in partnership with the Aldridge Foundation which developed a curriculum for Ballroom and Latin American Dance to be delivered in schools<sup>10</sup> and *Dance 4 Health*, (a six month research action project conducted by Warwickshire County Council's County Arts Service) which assessed the impact of community dance on physical health, psychological well-being and aspects of social inclusion, on a wide range of individuals.<sup>11</sup>

It is broadly acknowledged at government level and amongst health professionals in the UK, that there is a need to increase levels of physical activity across the whole population. *Young People & Physical Activity*, (a study conducted 1987-2003), explored trends in young people's attitudes to, and participation in, exercise and sport and reported an overall downward trend in levels of fitness, with females consistently reporting higher percentages in the 'Very Unfit/Unfit' end of the scale.

*Females tended to enjoy physical activity less than males, and overall there was a downward trend across both genders in the level of enjoyment of physical exercise as students became older. There was however an upward trend in the number of females who participated in dance classes "at least weekly".*

Trends: Young People and Physical Activity (2003)

These findings seem to concur with results from the *NRG Dance and Health Project*, which reported that females had a more significant increase in levels of interest and enjoyment in dance than males, and placed more effort and importance on the dance classes.

Both the *Young People & Physical Activity* study and the *NRG Dance and Health Project* demonstrate that although females report a more negative response to general physical activity than males, females exhibit more positive responses towards dance. This is important in the context of this study given that the population which it assessed was made up entirely of adolescent girls

The 2009 British government initiative *Be Active Be Healthy* which seeks to increase levels of physical activity among the population identifies "young adults who experience a drop-off in activity from the age of 16" as one of the population groups "most at risk" of developing a sedentary lifestyle which may lead to negative impacts on their health in later life. *Be Active Be Healthy* promotes a wide range of physical activities, including dance, as vital to good health and general well being, and is just one example of a wider ambition across local authorities, in schools, and amongst health professionals, to encourage young people to participate in physical activities and to maintain an active and healthy lifestyle in later life.<sup>12</sup>

## 4 Project Development

### School Recruitment and Engagement

All secondary schools in Gravesham, Swale and Medway areas were approached and offered the opportunity to participate in the project and the sessions were programmed within the existing school timetable.

9 schools were approached to participate in the project, 3 from each geographical area (Gravesham, Medway and Swale).

An initial individual meeting was held with each school and roles, responsibilities and guidelines were agreed between NKLAAP, dance artists, project researchers from Laban and the schools, in the form of a detailed partnership agreement.

### Devising the Dance Sessions

Female and male dance artists from contemporary dance backgrounds were recruited to devise and lead the delivery in schools. A dance artist who had delivered on the NRG Youth Dance and Health project facilitated and supported a two day devising programme with the *dance 4 your life* dance artists.

It was critical that content and delivery was consistent as well as being flexible and responsive to the needs, experiences and abilities of the young people, and the logistics of the overall programme. Together the dance artists devised and refined the dance session content, agreeing that each dance class would contain the following:

Warm Up

Creative Tasks

Choreography

Cool Down

The *dance 4 your life* dance sessions were high energy contemporary dance classes with a creative element, underpinned by health related themes. For clarity of research, the dance classes were defined as dynamic dance classes with an emphasis on strength building. They incorporated the use of core and upper body strength, and moderate to advanced stretches. The classes also had an emphasis on autonomy of choice, progression and development of movement phrases, peer critique and encouragement, and self improvement and motivation.



## 5 Project Delivery

### Timetable

The first and last sessions for all schools involved data collection for the research side of the project. Between the testing sessions the students took part in the weekly dance classes as outlined below.

The following table outlines the schools that were involved in the programme, their geographical area and the length of the dance session.

Name of School	Local Authority Area	Length of dance session
Northfleet School for Girls	Gravesham	1 hour 35 minutes
St Georges C of E School	Gravesham	2 hours
*Chatham Grammar School for Boys	Medway	1 hour 20 minutes
*Hundred of Hoo School	Medway	1 hour
Rainham School for Girls	Medway	1 hour 40 minutes
*Minster College	Swale	1 hour 35 minutes
Sittingbourne Community College	Swale	1 hour 40 minutes
The Westlands School	Swale	1 hour 40 minutes

Due to logistical difficulties:

\*Chatham Grammar School for Boys did not complete the programme

\*Hundred of Hoo School did not complete the programme

\*Minster College did not complete the programme



## 6 Research Methodology and Findings

(Detailed research methodology can be found in the full version of this report [www.nklaap.com](http://www.nklaap.com))

In order to provide a profile of the participants, certain physical characteristics and habitual level of physical activity were recorded before the dance classes took place. The participant group formed a homogenous group of females aged 14 years. The participants experienced between 5 to 12 hours of dance classes, which complied with the minimum quantity of hours required by researchers for analysis.

### Physical characteristics

Participant characteristics

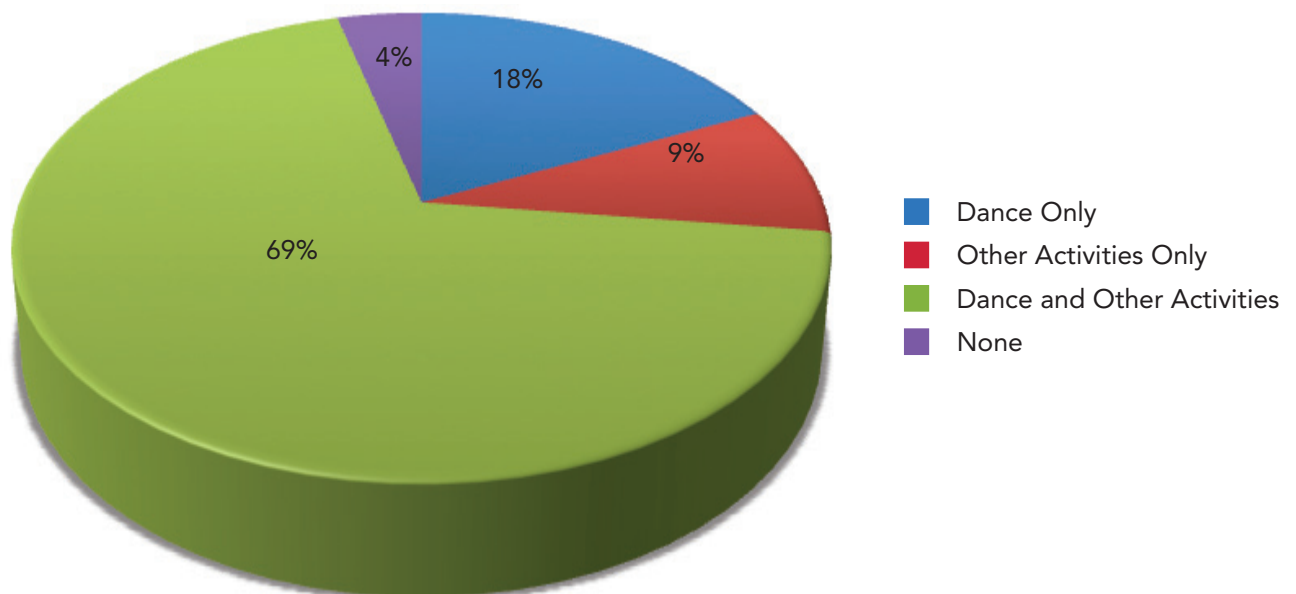
Gender	Total Participants	Age (Years)	Height (Metres)
Female	55	14	1.62

### Levels of habitual physical activity

The types of physical activity which participants took part in and their hours of exposure per week were recorded to establish an idea of the participants' initial fitness levels, and potentially aid in understanding the findings.

Participants undertook an average of 6 hours of physical activity per week, with over three quarters (87%) listing Dance as one of their activities. Other physical activities included PE, Badminton, Running, Walking, Squash and Volleyball. Fig 1 shows the breakdown of the different activities which participants undertook regularly:

Fig 1: Percentage of Habitual Physical Activity



## Physical Assessments

Based on the assessments and findings of previous studies, the following areas were chosen for assessment in this study:

Flexibility

Upper Body Strength

Aerobic Capacity

### Flexibility

Hamstring flexibility was assessed using a Sit-and-Reach Box (Micro Medical, UK) which measures lower back and leg range of motion. This is a standardised measure of flexibility and has been used successfully on children and young people<sup>13</sup> with a high level of reliability reported.<sup>14</sup>

### Upper Body Strength

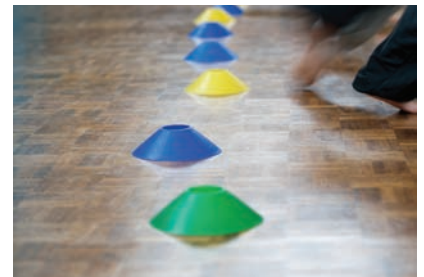
To determine the impact of the dance classes on upper body strength, a portable hand grip dynamometer (Takei, Japan) was used to measure dynamic upper body strength. The hand-grip is a standardized measure<sup>15</sup> and is suitable for use on adolescents.<sup>16</sup>

### Aerobic Capacity

The 20 metre Shuttle Run Test (more commonly known as the 'Bleep Test') was used to measure aerobic capacity. This test is frequently used with adolescents,<sup>17</sup> has strong reliability,<sup>18</sup> and has the advantage of being *"a task that most children and youth seem to enjoy, but... does require maximal effort"*.<sup>19</sup>

### Perceived Exertion

The Children's Effort Rating Test (CERT)<sup>20</sup> was used to determine participants' perceived effort (exertion) during the bleep test. The CERT is adapted especially for children and young people.<sup>21</sup> It allows the participant to grade how hard they feel they are physically working. When used in conjunction with heart rate testing, or repeatedly running maximal distances (such as the bleep test), it can also reflect changes in aerobic capacity. For example, a reduction in effort perception between pre-testing and post-testing of the Bleep test, could indicate an increase in aerobic capacity if, a participant reached the same level in the bleep test at pre and post testing (in other words they physically worked as hard but perceived that they were not as tired), or reached a higher level in the bleep test from pre to post testing but perceived the same level of effort (in other words they worked harder but did not perceive that to be the case).



## Physical Assessment Findings

No significant relationships were found between the amount of physical activity which participants undertook habitually, and the physiological and psychological areas assessed. This illustrates that the quantity of activity which the participants engaged in before starting the dance classes had no effect on the changes or lack of changes that occurred. Thus suggesting the dance classes were responsible for any changes which did occur.

There was no significant change in flexibility from pre-test stage to post-test stage. This indicates that these particular dance classes did not improve hamstring flexibility.

There was a statistically significant increase in overall hand grip strength from the pre-test stage to the post-test stage (see Fig 2). This indicates that these particular dance classes increased overall upper body strength.

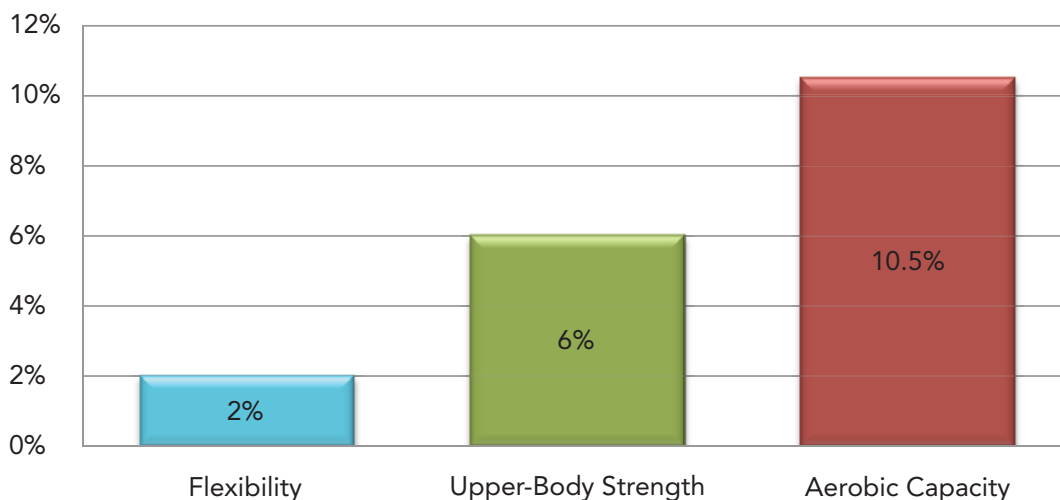
There was a statistically significant increase in aerobic capacity from pre-test stage to post-test stage (see Fig 2). This indicates an increase in cardiovascular fitness following the series of dance classes.

There was a statistically significant change in CERT scale from pre-test stage to post-test stage (see Fig 2).

There was also a relationship between the differences in Aerobic Capacity and CERT scale from pre-test stage to post-test stage, which indicated that as aerobic capacity increased, perceived exertion decreased. Further investigation through T-tests supported this inverted relationship therefore confirming that perceived level of exertion decreased as aerobic capacity increased.

Overall, there was a positive relationship between attendance and improvements in physical assessments with a statistically significant relationship between attendance and aerobic capacity. In other words the more dance classes the participants did, the more likely they were to show physical improvements.

Fig2: Overall percentage (%) increase in physiological assessments from pre-test to post-test stage



## Psychological Assessments

Research has shown correlations between involvement in physical activity, especially activities in which autonomy and a sense of competence and achievement are promoted, and enhanced personal well-being.<sup>22</sup> Progressing from the 2005-06 *NRG* project which investigated the impact of creative dance on well being,<sup>23</sup> this study sought to examine the impacts of a more physical dance class, on well-being.

The following areas of assessment were explored:

Self Esteem

Intrinsic Motivation

Attitudes towards Dance and Group Physical Activities

### Self Esteem

Dance as a physical activity has been shown to impact positively on levels of self esteem.<sup>24</sup> The Rosenberg Self Esteem Scale<sup>25</sup> (a standardised self esteem scale) was used to assess global self esteem among the participants. This scale has been validated by previous studies for use on the adolescent age group.<sup>26</sup>

### Intrinsic Motivation

Intrinsic motivation - participation in an activity for personal satisfaction rather than external reward or pressure - is a key facet in the sustainability of increased participation in physical activity.<sup>27</sup> Interventions which seek to increase levels of physical activity will not have far reaching impacts if the intrinsic motivation of individuals to participate in physical activities beyond the particular intervention is low.<sup>28</sup>

The Intrinsic Motivation Inventory,<sup>29</sup> a standardised scale was used to measure intrinsic motivation.

### Attitudes towards Dance and Group Physical Activities

In light of research which suggests that adolescent girls are receptive towards dance as a physical activity, even at an age where adolescents often tend to drop out of participation in physical activity<sup>30</sup> it was deemed useful to delve further into participants' general attitudes towards dance. A questionnaire was devised by the researchers to assess participants' attitudes towards group physical activities, and in particular, towards dance.



## Psychological Research Findings

There was a statistically significant increase in self esteem pre to post indicating that by participating in the dance classes the young peoples' general sense of self-worth was improved.

Intrinsic Motivation was found to be higher than average at both pre and post-test stages. There was no significant change in any of the four subscales of the Intrinsic Motivation scale.

This indicates that students were already intrinsically motivated to dance as an activity and this level of motivation was not affected by the dance classes.

Participants generally demonstrated a very positive attitude towards dance with the majority choosing words such as 'Fun', 'Interesting', and 'Energetic', to describe both how they perceived the dance classes might be like (at pre-test stage), and were actually like (at post-test stage).

The majority of participants reported at post-test stage that they felt 'Relaxed' and 'Comfortable' whilst doing the dance classes.

36 out of 55 participants said that dance would be their first choice as a physical activity to stay fit and healthy at pre-test stage.

38 out of 55 participants said that dance would be their first choice as a physical activity to stay fit and healthy at post -test stage.

One participant out of 55 said that dance would be their last choice as a physical activity to stay fit and healthy at pre-test stage.

None of the 55 participants said that dance would be their last choice as a physical activity to stay fit and healthy at post -test stage

Fig 3: Percentage of participants who reported that they felt 'Relaxed' or 'Self Conscious' during the dance classes

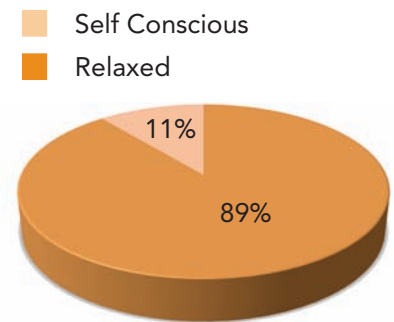


Fig 4: Percentage of participants who reported they felt 'Comfortable' or 'Uncomfortable' during the dance classes

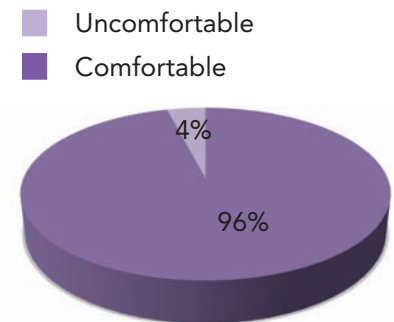
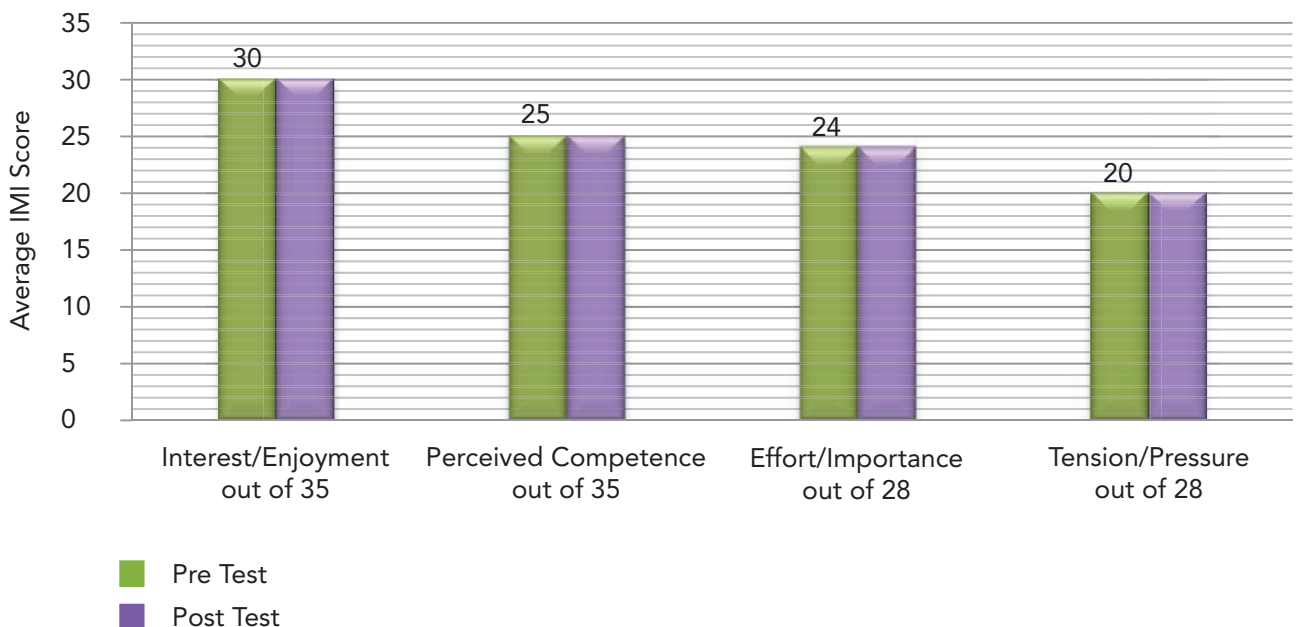


Fig 5: Levels of Intrinsic Motivation of participants at pre-test and post-test stage



## 7 Further Discussion and Implication of Research Findings

The findings of the *dance 4 your life* project provide evidence that participation in dynamic contemporary dance classes can have a positive impact on various aspects of the physiological and psychological status of adolescent girls.

The numerous benefits of physical activity on health and well being are now widely known. Regular physical activity as a vital tool for good health and disease prevention is advocated by local and nationwide initiatives.<sup>31</sup> Adolescent girls tend to enjoy physical activity less than their male counterparts, and participation in physical activity tends to decrease with age.<sup>32</sup> These findings indicate a need to find new ways of encouraging young people, and especially adolescent girls, to participate in physical activity. Continued participation in a physical activity however, is dependent upon an individual's attitude and personal enjoyment in that activity.

*dance 4 your life* has demonstrated both the positive impacts of dynamic dance classes on adolescent girls, and, perhaps more crucially, their receptive attitude towards dance as an activity to stay fit and healthy.

The research has demonstrated that aerobic capacity and upper body strength were increased following participation in the dance classes.

The dance classes in *dance 4 your life* contained energetic movement sequences, and had strength-building exercises which clearly resulted in beneficial physical results. The participants' high levels of intrinsic motivation towards dance before the project began, may also have contributed to the physiological improvements shown. The participants' high levels of intrinsic motivation and enjoyment of dance may have contributed towards a higher level of energy expenditure and subsequent improvements in aerobic capacity. Analysis furthermore demonstrated that as participants' hours of exposure to the classes increased, so too did their physiological improvements.

The consistently above average levels of intrinsic motivation reported at pre-test stage and post-test stage suggests that adolescent females have a positive and receptive attitude towards participation in dance.

Clearly, adolescent girls have a strong drive to participate in dance, and derive much enjoyment from it. Dance is therefore a hugely appropriate activity to promote when encouraging females to participate in physical activity.

Global self-esteem was significantly increased as a result of the *dance 4 your life* classes.

The increase in self esteem may be ascribed to a number of factors. The dance classes placed an emphasis on peer critique, positive reinforcement and realisation of goals. They aimed to provide a positive physical and creative learning environment which afforded autonomy in the realisation of goals and ownership of creativity. This was achieved through tasks which allowed participants to develop their own work, creating dance phrases and sequences, and relying on their peers for help and constructive feedback on their work. It would seem that a dance class is an ideal forum in which to provide such a constructive learning environment, combining elements of aerobic physical activity and goal achievement, with time for reflection, peer critique and creativity.<sup>33</sup>

## 8 Evaluation

Evaluation processes with both teachers and dance artists took the form of formal conversations, a facilitated session and the completion of evaluation forms at the end of the project. A variety of evaluation methods were utilised to obtain a well-rounded picture, endeavouring to demonstrate the varied outcomes and capture the true value and impact of the project. (All evaluation questionnaires used can be found in the full version of this report [www.nklaap.com](http://www.nklaap.com))



### School Teachers' Feedback

School teachers were encouraged to complete an evaluation questionnaire. The questionnaire was either completed in a face to face meeting with the Project Manager or together on the telephone. It is important to note that ongoing regular contact (either face to face, via email or telephone) with teachers and dance artists was maintained throughout the project to celebrate and share successes and face and solve challenges.



In some cases the young people had requested to carry on the dance sessions after the project had finished.

It was observed that among the students who had previously not participated in dance, the activity helped greatly in terms of developing movement memory. Some young people also claimed that they felt 'stronger' in their own bodies. In terms of areas of improvement, it was suggested that the classes could have been more challenging for specific young people who participated regularly in dance activities.

In some cases the project enabled non dancers and more experienced young dancers to work together which in their school teacher's opinion, encouraged leadership among the young people especially when participating in creative and group work. Generally, it was felt that the creative tasks were varied, well received by the young people, and that the resources were effective.

### Dance Artist Feedback

Dance Artist feedback was obtained through a dedicated feedback session during which the artists completed an evaluation questionnaire.

It was noted that most of the students enjoyed engaging with the sessions and learning about the healthy benefits of the activity. On a number of occasions students asked to repeat phrases of movement or exercises because they had enjoyed the experience from the previous session.

## 9 Future Recommendations and Considerations

*dance 4 your life* was a very successful project. It was enjoyed by participants, dance artists, and project partners. As with any project of this nature however, recommendations for future projects, and ways of improving project delivery have arisen.

### Length of Dance Sessions

Due to the nature of the timetabling arrangements in some schools, the shorter periods allocated to the programme, were not adequate enough to achieve some of the outcomes.

**Recommendation:** For future programmes of a similar nature a minimum of 75 min dance sessions are recommended in order to achieve the project outcomes.

### Consistency of Sessions

Due to logistical and timetabling difficulties, the regularity and length of the dance classes were subject to disruption at times. Furthermore regular participation in the dance classes showed a relationship to increased physical well-being.

**Recommendation:** Agree a fixed amount of weekly dance classes over a continued and sustained period of time. The recommendation would be at least 8 hours of dance class.

### Full Project Planning Session

Detailed initial and subsequent meetings and partnership agreements took place within the project, however a wider planning session involving all project partners would have been beneficial.

**Recommendation:** A programme of this nature would benefit from a wider planning session which would seek to manage expectation and profile the practical content.

### Control Group

Due to timetabling challenges and the availability of a wide range of students, this project did not have a control group (a proportionate group of same age and gender students who participate in the pre-tests and post-tests, but who do not participate in the dance classes).

**Recommendation:** In order to further validate the findings of future studies, a control group should be included.



## 10 Acknowledgements

### Participating Schools

Medway Council  
Chatham Grammar School for Boys  
Hundred of Hoo School  
Rainham School for Girls

Gravesham Borough Council  
Northfleet School for Girls  
St Georges C of E School

Swale Borough Council  
Minster College  
Sittingbourne Community College  
The Westlands School

Laban Dance Science Team  
Emma Redding, Edel Quin,  
Mary Kate Connolly, Laura Blazy,  
Ashley McGill, Sarah Irvine,  
Sanna Nordin and Ivan Thorley

Dance Artists  
Nina Atkinson  
Nathalie Chamberlain  
Kevin Jewell  
Kate Scott

Hampshire Dance  
[www.hampshiredance.org.uk](http://www.hampshiredance.org.uk)

Spaghetti Weston  
Photographs and Film  
[www.spaghettiweston.com](http://www.spaghettiweston.com)

Report written and compiled by Michelle Chorley, Mary Kate Connolly,  
Edel Quin, and Emma Redding

## 11 Contacts

### North Kent Local Authorities Arts Partnership (NKLAAP)

#### Gravesham Borough Council

Brian Tourle, Arts and Heritage Manager  
brian.tourle@gravesham.gov.uk

Lyndsey Thompson, Arts and Cultural Development Officer  
lyndsey.thompson@gravesham.gov.uk

#### Kent County Council

Gail Brown, Arts Manager  
gail.brown@kent.gov.uk

Emma Wilcox, Arts and Regeneration Officer  
emma.wilcox@kent.gov.uk

#### Medway Council

David Cotton, Arts Team Development Manager  
david.cotton@medway.gov.uk

Luci Napleton, Dance Development Consultant  
luci.napleton@medway.gov.uk

#### Swale Borough Council

Catherine Herbert, Arts and Heritage Officer  
catherineherbert@swale.gov.uk

Michelle Chorley, *dance 4 your life* Project Manager  
danceandhealth@btinternet.com

#### Arts Council England

Jan De Schynkel, Dance Officer  
jandeschynkel@artscouncil.org.uk

Caroline Coates, Local Government Officer  
caroline.coates@artscouncil.org.uk

#### Laban

Emma Redding PhD, Programme Leader - Dance Science  
e.redding@laban.org

Edel Quin MSc, Dance Science Lecturer and Researcher  
e.quin@laban.org

Mary Kate Connolly MA  
m.connolly@laban.org, Dance Science Researcher

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