Alongside the intervention there appeared to be an improvement in the non-verbal reasoning skills in many of the pupils. At the start of the intervention all students had a score of below 80 (100 being the average score). A sample of twenty five students were looked at. Of the twenty five, fifteen showed an increase in their non-verbal reasoning (NVR scores). Nine of the fifteen showed an improvement between +5 and +31. It is difficult to assess whether the intervention was the sole factor but as a pilot study it would appear worth investigating further in a longer study with more pupils and greater statistical rigor e.g. control groups for comparison.

Research Methods

The following data collection methods were used:

Qualitative Processes	Quantative Process
Pupil diary	NFER-Non-Verbal Reasoning 12-14 tests (pre and post)
Interviews	
Observations	

As the project involved two cohorts we were able to critically reflect upon the project and develop a structured reflective diary during the investigation. This enabled us to get meaningful emotional responses and to establish pupil's perceptions of their own abilities.

The diaries focused on successful outcomes and ask for students' own evaluation of what helped. As researchers we found that too much time was spent with the first cohort looking for 'magic moments' and recording them haphazardly. This created additional pressure for both the creative practitioner and students. Creating a more focussed method of data collection assisted analysis and highlighted patterns.

The NFER Non Verbal Reasoning Test helps identify how easy a student will aquire new concepts by presenting them with a range of tasks that are free from cultural or gender bias. The test is used in many schools as part of the induction process.

Conclusions

At the end of each five week intervention all students had made progress in tightrope walking and juggling. Many had mastered these skills and had a genuine affection for their achievement. Other students had made improvements on where they had been five weeks earlier. When students were unsuccessful and decided to disengage, we identified two distinct avoidance techniques: passive non-participation; and aggressive non-participation. The aggressive non-participants attracted attention and took up a great deal of resources. The passive technique was less obvious, but was no less destructive to their learning and confidence. Once both avoidance techniques were recognised, we took a decision to interrupt the associated patterns of behaviour, and in most cases were able to develop strategies to support students to make progress.

The project highlighted the fundamental need for students to be actively engaged in a learning environment and to sustain that approach if progress is to be made. Frustration caused from lack of success needs to be recognised and managed at the earliest opportunity. The setting of personalised achievable targets appeared to be the key to success.

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This publication has been supported by the DfES Innovation Unit
http://www.standards.gov.uk/innovation-unit

National Teacher Research Panel
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Enhancing student engagement

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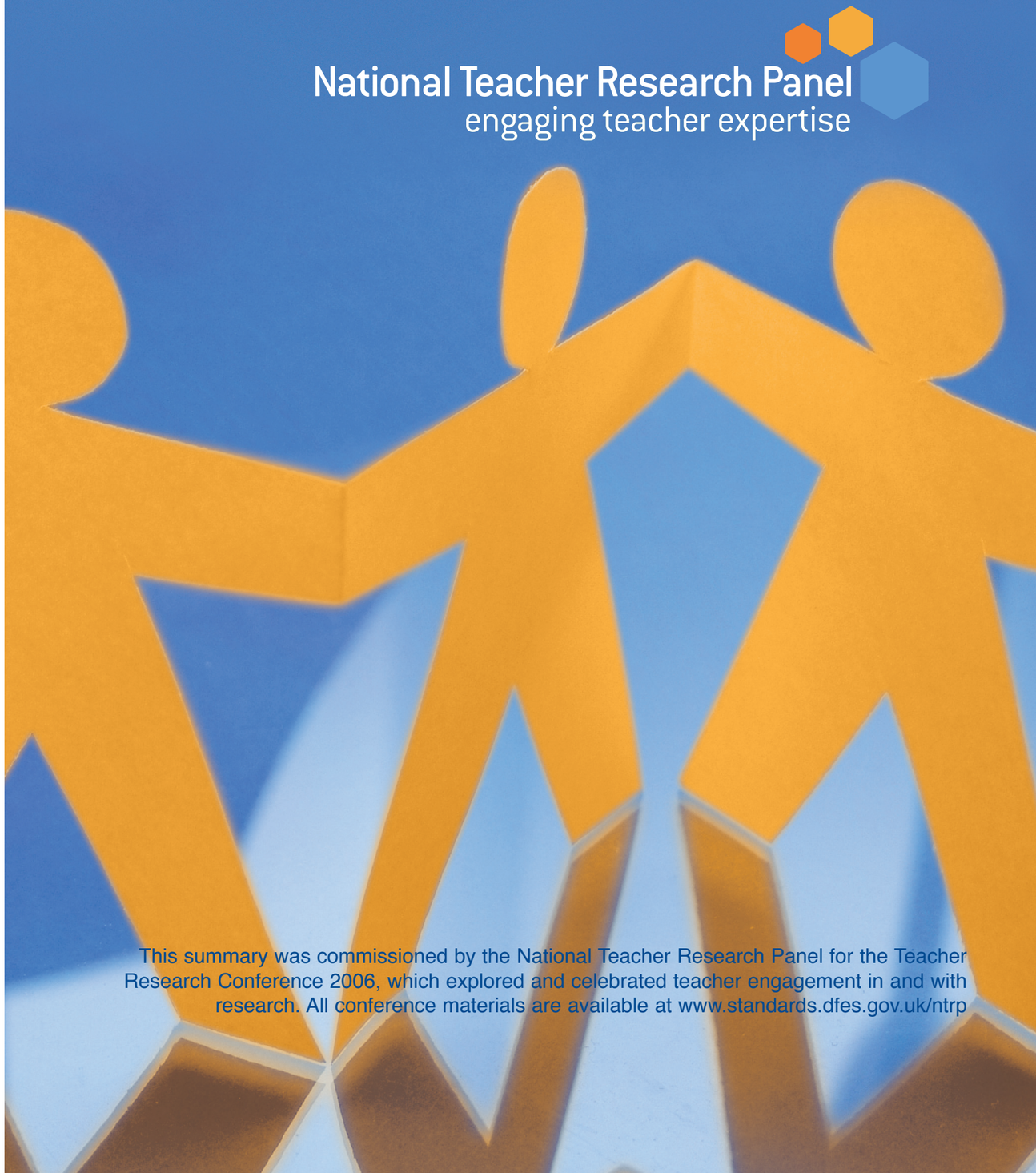


This summary was commissioned by the National Teacher Research Panel for the Teacher Research Conference 2006, which explored and celebrated teacher engagement in and with research. All conference materials are available at www.standards.dfes.gov.uk/ntrp

Aims

- To investigate the impact of physical theatre skills on a group of Year 8 students identified as needing to develop their non-verbal reasoning skills further.
- To document the processes and problem solving strategies Year 8 pupils use when attempting to learn a new, creative physical skill.

Dimensions

The research focused on the impact that a 'Circus Skills Intervention' would have on the problem-solving skills of a targeted group of 40 Year 8 students. The students were identified as having difficulties solving Non-Verbal Reasoning tasks. The target group was of mixed ability, gender and differing levels of disruptive behaviour and attendance. The students were split into cohorts; each cohort had a 5 week intervention of 1 and half hours per week. The study was completed over the spring and summer terms 2005. A creative practitioner and three members of the schools Key Stage 3 behaviour support team managed the intervention.

Summary of main findings

- There were three general pupil responses to the intervention when frustration occurred. These were passive non-participation, aggressive non-participation and a minority of unaltered motivation.
- In most cases strategies to counter pupil frustration could be developed for each individual, which led to longer periods of positive student participation. The second cohort used a focused solution tool to help identify what they needed to do to improve their performance.
- Pupils equated improvement with high levels of confidence and concentration.
- A significant proportion of pupils improved their non-verbal reasoning (NVR) skills. Fifteen of the twenty five students sampled showed an increase in their NVR scores. Of the fifteen who showed an improvement nine showed an increase of +5 to +31.
- Staff developed a diary/evaluation tool to enable pupils to reflect, evaluate and set personalised learning targets.
- The research has had an impact on how the KS3 behaviour support team manage intervention with groups and individuals.

Background and Context

City of Norwich School (CNS) is a 12-18 secondary comprehensive school of 1450 students and 83 teachers.

The project was focused upon a targeted group of pupils who had previously demonstrated difficulty with non-verbal problem solving skills. It was hypothesised that assisting their problem solving skills might influence their ability to engage with other learning opportunities. Introducing a physical intervention, which provided a focus and challenge for pupils enabled the researchers to investigate what strategies they were using to learn. The circus skills intervention was chosen as a discrete, observable event and one that would engage the interest of these pupils. Such an intervention might also assist researchers and participants to appreciate ways in which pupils managed, or were affected by, frustration.

This area of study was chosen as it represented a long standing interest of both teacher and creative partner. The creative partner, Dr Ken Farquhar, wanted to study in more detail his observations that a large number of organisations had claimed the positive benefits of circus skills for motivation and learning in schools. Martin Sawyer from CNS had noticed that many students who often failed to engage in lessons also had below average non-verbal reasoning skills. Both Martin and Ken had previously worked together in summer schools attempting to engage students in challenging learning activities.

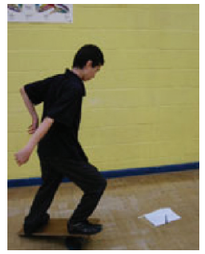
The school's headteacher, Gordon Boyd, supported the project, seeing this intervention as a valuable way of raising achievement within school.

Teaching strategies

Pupils had to solve the following problems;

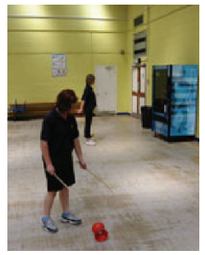
Walking a 3m tight-rope 0.5m above the ground

Juggling 3 balls



Rolla Bolla

Flower Stick



Diabolo

Spinning Plates

Each group had five 90 minute sessions and focused on juggling and tightrope walking. Once they had mastered these skills they were allowed to progress to any of the remaining tasks on the list.

Sessions 1-4 concentrated predominantly on juggling and tightrope walking. The early sessions were planned so that pupils had to focus on a unique experience (tightrope walking) and one they could demonstrate to their peers (juggling). Otherwise there was the possibility that pupils would focus on less demanding activities or ones they were already competent at. Therefore the design of activities had in-built personal and social challenges.

Pupils improved relatively slowly and many expressed frustration. In the fifth session it was possible to allow other circus skills activities to take place to expand the experiences of the learner.

After studying the accumulated data of the first cohort it was apparent that the students tended to focus on their failures rather than their successes. In keeping with Action Research methodology, we refined the data collection and design for the second cohort. We created a framework, a personalised diary, which deliberately steered the pupils towards focussing on their successes and how they could build upon their current achievement.

Learning strategies

The partnership felt that providing physical and cognitive problems to solve in a non-threatening learning environment, would remove the threat of failure to students and help them redefine success as a willingness to take risks and engage in activities. CNS like many other high schools has noted that there are a group of mainly boys that underachieve. The strategies for improving performance/engagement in the activity developed by students were wide-ranging and sometimes very unusual.

We grouped the strategies in the following ways:

- *very general* - i.e., concentrate more, practice more, focus; and
- *very specific* - i.e. walk slower on the tightrope, move more smoothly, improve balance.

Students in the second cohort were also encouraged to keep a reflective diary. All these strategies were identified by the students themselves, recorded in their diaries, or in conversation with the creative partner and teaching assistant.

Detailed findings

The researchers believed that the circus skill activity would engage the students on the basis of novelty and curiosity alone. However, students' responses to the circus activities were similar to those in any classroom. When students were faced with frustration, they reacted in one of three ways:

- approximately 40% of the students disengaged passively;
- approximately 40% of them disengaged with aggression; and
- the remainder continued with the same motivation.

The response to the frustration when learning became problematic mirrored the student behaviour to frustration in the classroom.

In discussion, the passive responders described how they avoided confrontation with staff in the classroom when not engaging. These pupils described how they would not disrupt the learning of others because they didn't want to draw attention to the fact that they themselves were not engaging. An unintended outcome from working with such small groups was that it was possible to identify this passive resistance and support the students so that they would re-engage. The students who became frustrated and disengaged passively needed support from either peers or the adults present to develop strategies to be successful. One such strategy was to ask the student questions about why they had not succeeded and encouraging them to think about what they needed to do in order to succeed. This group were often quiet, undemanding students, however, when successful they displayed their emotional responses in a measured and deliberate way. The responses ranged from congratulatory smiles to written comments in their evaluation diaries.

One student who was typical of those who displayed passive disengagement, commented early on in the project:

> *"I don't want to participate because I'm confused as to why we've been picked, because I feel it has something to do with intelligence and it's boring doing the same thing every week".*

However, the following remark shows how the same student 's attitude had changed over the course of the intervention:

> *"I felt really determined and more successful this week because I am more confident, being able to do it is fun, it was so brilliant when I did it, it was really sudden".*

The students who became frustrated and disengaged aggressively drew a huge amount of attention from adults. The following quote from one of the students in this category illustrates how:

> *"When are we going to do the diablo, I can do that, I am good at that, when are we going to do something different? This is boring; I never wanted to do this anyway".*
> *(The student became very agitated and verbally aggressive, swearing and behaving in a defiant and oppositional way.)*

But even with these students, the intervention often seemed to have a positive impact. Later in the intervention, the same student commented:

> *"Take a picture of me, look, look, I can do it now, watch me, I've got it sussed"*

Student reflection and non-verbal reasoning

Both cohorts developed more specific targets over the five week intervention. However the second cohort who used the structured reflective diary that focused on success, generated more specific targets than the first cohort.

Over the course of five weeks the reflective diary (Dr Ken's Curiosity Scale) helped students record an honest account of their progress, and, whilst focusing on success, the diary also acknowledged the students' emotional world. These honest comments on their emotional state enabled pupils to communicate with the creative practitioner more effectively.