A pilot study to improve academic learning time in physical education

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Recommended Citation
Figure 5. A comparison of behaviours based on averages from lessons 1 – 3 (baseline) and lessons 4 – 6 (intervention).

Figure 6. ALT–PE as a percentage of total lesson time from lesson 1 to lesson 6.
Figure 6 illustrates the significance of the rise in ALT-PE from the baseline to the intervention phase. The baseline and intervention phase remain constant over the series of three lessons within each phase.

Figure 7 illustrates transition time as a percentage of total lesson time over the six lessons. A large decrease in transition time is shown in the intervention phase.

![Graph](https://via.placeholder.com/150)

**Figure 7.** Transition time as a percentage of total lesson time from lesson 1 to 6.

Research Question 3

*Which teacher behaviours changed to allow ALT-PE to increase?*
The results indicate that the teacher was able to modify his behaviour when given clear goals and specific feedback related to the key behaviours. Using the ALT-PE/SPORT Observation Instrument ensured precise and focused feedback. Video tapes were used to show the teachers more effective and less effective teaching behaviours within lessons. This appeared to have a strong impact on the teacher and helped form new planned goals for improvement. All feedback given during the intervention phase took place within two days following the lesson so that the lesson was still fresh in the teacher's mind.

As a result of preliminary discussions and selected video play-backs, the teacher set goals to improve equipment distribution, to give clearer instructions and to use alternative practice formations. A book relating to mini-tennis was provided to the teacher. As a result of the first intervention there was marked improvement. The amount of ALT-PE more than doubled. To achieve such a high percentage of ALT-PE there was a considerable reduction in transition time and in the time spent in activity supporting.

As a result of discussions during the second intervention, the teacher reported an awareness of the higher rate of ALT-PE in his lessons. He was aware that in previous lessons a considerable amount of activity time had been taken up by students supporting their partners. The teacher reported that the reference book on mini-tennis was valuable as it gave him a wider range of ideas for skills practices, rather than using his own ideas.

For the final lesson, the teacher was to continue in his progress by increasing the amount of ALT-PE students received. He also focused on having students actively involved in demonstrations where they practised the motor activity with
the teacher. The data presented in Table 6 shows how the average percentage of
time in the baseline phase differed once intervention was given.

The key behaviours undergoing the most change were transition time, knowledge,
activity performing and activity supporting. The changes in the teacher's
behaviour that caused increases and decreases in these four key behaviours follow.

### TABLE 6
MODIFICATION OF TEACHER BEHAVIOUR
FROM BASELINE TO INTERVENTION

<table>
<thead>
<tr>
<th>Key Behaviour</th>
<th>Average for Baseline</th>
<th>Average for Intervention</th>
<th>Percentage Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management</td>
<td>1.5%</td>
<td>0 %</td>
<td>- 1.5%</td>
</tr>
<tr>
<td>Transition</td>
<td>50.0%</td>
<td>36.8%</td>
<td>- 13.2%</td>
</tr>
<tr>
<td>Waiting</td>
<td>2.2%</td>
<td>3.3%</td>
<td>+ 1.1%</td>
</tr>
<tr>
<td>Knowledge</td>
<td>17.2%</td>
<td>10.2%</td>
<td>- 7.0%</td>
</tr>
<tr>
<td>Activity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Warm up</td>
<td>5.2%</td>
<td>- 0.6%</td>
</tr>
<tr>
<td></td>
<td>- Performing</td>
<td>17.3%</td>
<td>+ 24.9%</td>
</tr>
<tr>
<td></td>
<td>- Too Difficult</td>
<td>0.6%</td>
<td>+ 0.9%</td>
</tr>
<tr>
<td></td>
<td>- Supporting</td>
<td>6.6%</td>
<td>- 5.1%</td>
</tr>
<tr>
<td></td>
<td>- Inappropriate</td>
<td>0 %</td>
<td>0 %</td>
</tr>
<tr>
<td>Off Task</td>
<td>0 %</td>
<td>0 %</td>
<td>0 %</td>
</tr>
</tbody>
</table>

Comparison of Behaviours

**Transition Time:**

In the first three lessons prior to intervention, transition time occupied the
majority of the lesson (50%). Intervention focused heavily on reducing transition
time. Transition time was reduced by an average of 13.2% during the intervention
phase. Modifications and discussions about the teacher's behaviour between the baseline and the intervention phase are listed below.

- Students wasted time travelling to and from the equipment bin during the lessons. Partners often shared equipment. It was suggested that all students should get a bat and ball at the commencement of the lesson, and leave unused equipment nearby when it was not required.

- Various teaching formations were discussed to allow the teacher more options for skills practice and demonstrations.

- After showing video play-backs of the lesson, the teacher recognized that far too much time was spent talking and explaining an activity in a repetitious fashion. Far more clear and precise instructions were needed.

- The teacher reduced the amount of time spent talking by providing feedback to individuals rather than the whole class. He talked only to those students who needed feedback.

- The teacher became more conscious of the time wasted when students entered and departed from a skill demonstration. Vocabulary was used to hurry up the students when moving to and from practice formations.

Activity-Performing:

The term Activity-performing referred to the criterion task being performed with a high amount of success (ALT-PE). The amount of ALT-PE increased 24.9% from the baseline phase. Intervention was aimed at modifying the teacher's behaviour in order to:
increase the types of practice formations and skills practices by providing a source book on mini-tennis;

encourage the teacher to explain the activity before the students moved so that practise could begin immediately;

use partner and individual activities in preference to relays. This resulted in higher amounts of practice time;

give longer practice time between teacher interruptions;

Activity-Supporting:

The term Activity-Supporting referred to the student supporting a partner in the skills practice, such as, bouncing the ball to the forehand side. In the baseline phase, activity supporting accounted for 6.6% of the lesson time. This could be considered a substantial amount of time as the supporting student is not involved in learning the criterion task. Intervention reduced the amount of time a student spent supporting another student by 5.1%. The supporting role rarely existed in the intervention lessons. The way in which the teacher modified his behaviour is listed below.

Skill practices selected did not require a supporting student. This resulted in whole class involvement in activities at the same time. Instead of a student bouncing the ball, the student would bounce-hit the ball to a partner, who would hit the ball back after the first bounce. The ball would be caught and the procedure repeated.
Knowledge:

Table 6 shows that there was a 7% decrease in the knowledge component of lessons. No feedback inferred that this key behaviour should be reduced. Two possible reasons for this decrease are listed below.

- The decrease could be contributed to the teacher attempting to have the students involved in active demonstrations. When students were involved in active demonstrations such as stepping through the serve action, Activity-Performing was recorded resulting in an increase in ALT-PE.

- The teacher reduced talking time by using clear and concise language.

It may be argued that the knowledge component, where students are involved in watching demonstrations or listening to the teaching points, strategies or rules of the game are equally as important as performing the motor activity.

Activity-Performing (ALT-PE) and knowledge appear to be the key behaviours that most effectively use the class time. Figure 8 has combined these two key behaviours. As a result, an average of 52.4% of class lesson time was devoted to the criterion task for the intervention phase. This compares with an average of 34.4% of class time during the baseline phase.
General class management, transition time, waiting to get involved in activity and supporting during an activity are not effective uses of lesson time. While students are experiencing these key behaviours they are not involved with the criterion task for the lesson. During the intervention phase, students were not involved with the task for an average of 41.6% of each lesson compared with 59.9% during the baseline phase. This is shown graphically in Figure 9. Warm-up activities were excluded from both categories, as it could be considered that warm-up activities are essential to every lesson. However, they may not relate to the criterion task for the lesson.
Figure 9. Student non-involvement with the criterion task from lesson 1 to lesson 6.

Research Question 4

*Do lessons that contain higher ALT-PE differ in structure to lessons with low ALT-PE?*

It has been established that the teacher modified his behaviour to produce lessons with a greater amount of ALT-PE. The two key behaviours that changed significantly between the baseline and intervention phase were Activity-Performing (ALT-PE) and Transition time. Lesson 1 and lesson 4 were compared to see what changes in lesson structure occurred. These two lessons were compared as they were the first lesson in each phase.
The lessons were analysed to obtain the average length of key behaviour episodes. The observation instrument used 5 second observe, 5 second record. This allows six key behaviours each minute. An episode is the number of uninterrupted blocks of time that the key behaviour occurred in the lesson. An episode block is recorded when there is one or more of the same key behaviour.

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\begin{array}{cccccccc}
\end{array}
\]

Episodes for (T)

In the above example, there are 3 episodes for the key behaviour transition (T).

**Transition Time:**

Table 7 compares the number of transition episodes between lesson 1 and lesson 4. Although lesson 4 has a greater amount of transition episodes, transition accounted for only 35.5% of the total lesson, compared to 51.3% for lesson 1. The average length for each episode was calculated by dividing the number of episodes into the total number of transition intervals.
TABLE 7
A COMPARISON OF TRANSITION TIME BETWEEN LESSON 1 AND LESSON 4

<table>
<thead>
<tr>
<th>Lesson</th>
<th>% of Lesson Transition Episodes</th>
<th>No. of Transition Episodes</th>
<th>Average Length of Episodes</th>
<th>Length in Time</th>
<th>Total No. of Intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>51.3%</td>
<td>22</td>
<td>3.64</td>
<td>36.24 sec</td>
<td>80/156</td>
</tr>
<tr>
<td>4</td>
<td>35.5%</td>
<td>26</td>
<td>2.23</td>
<td>22.18 sec</td>
<td>58/173</td>
</tr>
</tbody>
</table>

The results show that during the baseline phase the average length for each transition episode was 3.64 seconds compared with 2.33 seconds during the intervention phase. To give these figures a greater meaning the episode length can be converted to time. The data shows that during the intervention phase the teacher reduced the average length of each episode to 22.18 seconds, compared to 36.24 seconds during the baseline phase.

The teacher was conscious of the fact that transition time was not the most effective use of time and should be kept to a minimum. This reduction in transition episode time could be accounted for by the teacher using clear, concise and nonrepetitive instruction.

Academic Learning Time (ALT):

Table 8 compares the number of Activity-Performing episodes between lesson 1 and lesson 4. The results show an increase in Activity-Performing episodes in lesson 4 following intervention. The average duration of each Activity-Performing episode also increased from 28 seconds to 38 seconds. This accounts for why there was a greater number of Activity-Performing intervals in lesson 4.
Another aspect of lesson structure, that is evident between the baseline and intervention, is the patterns of the key behaviours within a lesson. In lesson 1 Activity-Performing is scattered between a mass of transition and knowledge episodes. The longest amount of time a student could practise the skill without interruption was 60 seconds. There are large amounts of time between skills practices. The longest period between any activity was three minutes. The majority of this three minutes was taken up in transition time, where the teacher was organizing the class for the next practice.

In contrast, lesson 4 shows a clearer picture of the lesson format. There are twelve different skills practices within the lesson. In between each of these practices are short episodes of knowledge and transitions. The longest amount of time between any two activities is also three minutes. However, of these three minutes, one minute and ten seconds is devoted to knowledge, and the remainder to transition time. In comparison, only ten seconds of this three minutes is devoted to knowledge in lesson 1. Table 9 displays key differences between lesson 1 and lesson 4.
TABLE 9
PATTERNS WITHIN AND BETWEEN LESSONS 1 AND 4

<table>
<thead>
<tr>
<th>Aspects</th>
<th>Lesson 1</th>
<th>Lesson 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time taken before first Activity-Performing behaviour</td>
<td>4.40 sec</td>
<td>3.30 sec</td>
</tr>
<tr>
<td>Largest Activity Performing episode</td>
<td>1.00 sec</td>
<td>1.40 sec</td>
</tr>
<tr>
<td>Largest Transition episode</td>
<td>2.10 sec</td>
<td>1.10 sec</td>
</tr>
<tr>
<td>Average length of time taken between Skills Practices</td>
<td>1.40 sec</td>
<td>33.00 sec</td>
</tr>
</tbody>
</table>

These data show that the teacher used less time organizing and instructing students between the various skills practices following intervention. Only an average of thirty-three seconds was required to give any necessary knowledge and to vary the skills practice.

Research Question 5

_How significant are the ALT-PE increases received by the children?_

No statistical measure can be used to gauge the significance of the increase in ALT-PE between the baseline and intervention phase. One way to show the significance of the ALT-PE increase is to change the percentages to an amount of time. Table 10 shows the ALT-PE for each of the six lessons in minutes and seconds. It should be noted that physical education lessons at the school are for thirty minutes duration. For the purpose of this study, lessons were also thirty minutes. For this reason, Table 10 has converted the percentages to time for a thirty minute lesson.
TABLE 10
THE AMOUNT OF ALT IN LESSONS 1 - 6 EXPRESSED AS A UNIT OF TIME.

<table>
<thead>
<tr>
<th>Lesson</th>
<th>% of ALT</th>
<th>Time (30 min lesson)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>18.0%</td>
<td>5 min 24 sec</td>
</tr>
<tr>
<td>2</td>
<td>17.5%</td>
<td>5 min 15 sec</td>
</tr>
<tr>
<td>3</td>
<td>16.3%</td>
<td>4 min 53 sec</td>
</tr>
<tr>
<td>Baseline Average</td>
<td>17.3%</td>
<td>5 min 11 sec</td>
</tr>
<tr>
<td>4</td>
<td>45.7%</td>
<td>13 min 43 sec</td>
</tr>
<tr>
<td>5</td>
<td>39.7%</td>
<td>11 min 55 sec</td>
</tr>
<tr>
<td>6</td>
<td>41.3%</td>
<td>12 min 23 sec</td>
</tr>
<tr>
<td>Intervention Average</td>
<td>42.2%</td>
<td>12 min 40 sec</td>
</tr>
</tbody>
</table>

When comparing the amount of ALT-PE offered following intervention, one notices an average increase of seven minutes twenty-nine seconds. At the primary school where the study was undertaken, the students are involved in two half hour skills sessions a week. Table 11 illustrates the significance of the increase in ALT-PE over a week, one term and a whole school year.

TABLE 11
TIME INCREASES OF ALT-PE FOLLOWING INTERVENTION.

<table>
<thead>
<tr>
<th>Increase in ALT</th>
<th>1 Week (Two lessons)</th>
<th>1 Term (10 weeks)</th>
<th>1 Year (40 weeks)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 min 29 sec</td>
<td>14 min 58 sec</td>
<td>149 min 40 sec</td>
<td>598 min 40 sec</td>
</tr>
</tbody>
</table>

It should be noted that these times are only showing the increase in ALT-PE (the extra time they could be practising the criterion skill) following the modification to a teacher’s behaviour. The final total of 598 minutes 40 seconds is the amount
of extra lesson time that the students would receive practising the criterion task over a year, if the teacher sustained this level of performance. Without intervention, the teacher would require a further twenty lessons to obtain the same amount of ALT-PE.

Discussion of Results

The results have been presented in graphs, figures and tables and the five research questions have been addressed. It is important, however, to discuss the results and to see how the results from this study compare to similar studies.

In an attempt to keep the results segmented, the results will be discussed in the three main areas of:

The baseline;
The intervention;
The teacher's perception.

Baseline

The amount of ALT-PE that students received during the baseline phase of this study compared favourably with results of other studies. Godbout et al. (1983) reported 20% ALT-PE and 14% cognitive engagement in the physical education lessons observed.

The baseline for ALT-PE in this study also compares closely with a study carried out by Placek et al. (1982). These results found that all students in the class
received an ALT measure between 15% and 24% of class time. The results showed little variation regardless of sex or skill level.

Other ALT-PE recordings from studies carried out in physical education remain reasonably consistent. Graham et al. (1983) found that students spent 21% of class time practising the criterion task.

The teacher was surprised by the amount of time that students were actually practicing the skill during the baseline phase. He believed that the level of ALT-PE was inadequate and far less than it should be. He was concerned at the amount of time taken up in the management and organization of instruction (transition time).

**Intervention**

The results have shown how the teacher was able to increase the amount of ALT-PE by 24.9% following intervention. A baseline of 17% ALT-PE increased to 29% ALT-PE. A study carried out by Paese (1987) reports a 12% increase in the amount of ALT-PE following intervention.

The results of this study indicated that the feedback given had a positive effect on modifying the teacher's behaviour. Clinical supervision was used to set the teacher clear goals from which he was able to modify management and student activity time in the intended direction. The researcher cannot assume that intervention is the sole factor for the change in behaviour. Three factors that may have influenced the results need to be recognized. The first factor is the change of classes between the baseline and intervention phase. The two classes were of the same age and from the same school. The second factor acknowledges that
the teacher may improve upon his performance when repeating a similar lesson. This is known as the coaching effect. The third factor that may have influenced the results is the fact that the researcher was also the recorder of the data.

In a physical education lesson there needs to be a balance between maximum activity time, demonstrations, knowledge, and clear instructions about the skill or game. These factors take up a large percentage of each lesson and have been shown to vary considerably between the lessons. Through the intervention programme, the teacher was able to modify his behaviour in many ways to increase the ALT-PE between the first and last lesson.

Teacher's Perception

Following the intervention used in this study, the teacher understood the need to increase the time spent by students practising the skill correctly. During a postlesson conference following the last lesson, the teacher stated that as much time as possible needs to be allocated to practising the skill as long as interest, variety and quality instructions are maintained.

He stated his major aims for being an effective teacher were to have sufficient equipment and organizational procedures to allow students maximum participation and equipment. He also believed effective physical educators need to have a good knowledge of skill development processes, give quality demonstrations and provide correct teaching points.

The teacher under study believed that the feedback given was most valuable. He believed that presenting the percentage figure of the lesson time devoted to ALT-PE highlighted a need for improvement. The teacher thought the anecdotal notes
and video play-backs were useful in identifying any weaknesses and modifying teacher behaviours.

Having someone providing feedback on a teacher's behaviour was acknowledged as being very valuable. He wished it could happen more often but admitted cringing at times when students did not understand any poorly worded instructions.

In an attempt to increase the amount of time that students spent in learning during physical education, the teacher agreed that an ALT-PE/SPORT instrument would be worthwhile implementing as an effective style of feedback. The teacher suggested the idea of self-analysis, where the teacher codes a video tape on his own teaching taken by a peer or child. This would overcome the possibility of uneasiness.

Summary

This chapter has dealt with the analysis and discussion of the data. The chapter attended to the five research questions by providing a discussion of the subject and the behaviours that were associated with the investigation of each question.
CHAPTER 5

SUMMARY AND CONCLUSIONS
CHAPTER 5

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This chapter presents a summary of the results together with the conclusions based on the results of the intervention on a teacher's performance. It concludes with recommendations for using ALT-PE for further study as a variable for measuring teacher effectiveness.

The purpose of this pilot study was to establish whether a designed procedure could increase the amount of ALT-PE. The procedure involved the provision of feedback to a teacher about a student's learning time and the proportion of that time which was ALT-PE.

This study used an experienced physical education specialist teaching a series of actual lessons to students in intact classes as part of the school's usual physical education programme. The students were already familiar with the teacher as he had been at the school for three years. This study attempted to make a practical and realistic contribution to the teacher effectiveness literature relating to what is happening in physical education.

In order to obtain the appropriate data, two year 6 classes participated in three mini-tennis lessons each. These lessons were held once a week over a period of six weeks. The first three lessons were taken with one class to establish a baseline. The last three lessons that incorporated intervention were taken with the other class. The two classes were taught the same content.
As a result of the classes’ participation, the amount of ALT-PE that students received in the classes was established. The amount of ALT-PE the class received was derived from one target student. Once the results were obtained it became clear that the amount of ALT-PE was significantly greater once intervention occurred.

Summary of Results

The researcher’s subjective opinion about the quality of the physical education specialist prior to the study suggested that class time was used efficiently. However, the first three lessons used to form the baseline showed that the behaviour paralleled those of previous studies in the literature. Students were not as active in the lessons as first thought.

It seems to be universally accepted that recognizing the opportunities for student learning is a viable characteristic of effective teaching (Grant, 1983). Classroom research has shown that there is a need to keep students on task and engaged in appropriate activities.

Two variables, content covered and academically engaged minutes, have yielded the highest and most consistent correlations and gains in achievement of any of the classroom variables studies.


This study was successful in meeting Rosenshine’s variables that indicated gains in student achievement. Academically engaged minutes increased by an average of 24.9% following intervention. To achieve this increase, it was necessary to give feedback on class management and lesson content organization.
No stated amount exists to determine how much lesson time should be devoted to ALT-PE. The teacher is the best judge about how much ALT-PE should be given in a lesson. The teacher in this study believed that he would like to achieve a maximum of 45–50% ALT-PE in most lessons. He believes it would be difficult to achieve a higher result. Organizing and instructing the students is an essential part of every lesson. If categories other than ALT-PE are overlooked, the quality of student engaged time may deteriorate.

The data revealed that the teacher could change his key behaviours in the intended direction following intervention. The increase in the amount of ALT-PE students' received rose significantly from the baseline. The amount of ALT-PE did not keep increasing following each intervention. Following the first intervention the amount of ALT-PE remained fairly stable. Although no norm exists for the amount of ALT-PE expected in physical education lessons the content of a lesson can have an effect on the ALT-PE achieved. Due to this, it was decided to use two classes where lessons would cover similar content. The teacher was instructed to teach the first three lessons of mini-tennis to both classes. Standardizing content was chosen in preference to using only one class where content would differ. It would have been hard to intervene on teacher behaviours in lesson 5 and 6 as it was likely that children would be involved in actual games by that time. When children were playing the game the teacher would have less control over students' ALT-PE in the lesson, unless he was participating in the same game.
Conclusions

This study aimed to provide students with a greater amount of ALT-PE in physical education lessons. It was considered important to increase ALT-PE as it has been shown to relate to student achievement. Of particular interest to the researcher was to investigate how students spent their time in physical education lessons.

The results of the study were able to support the research question. The teacher can increase the amount of ALT-PE students receive. This was a result of intervention aimed at modifying teacher behaviours.

This study has shown that students are not so active during a physical education lesson as one might assume. Even though the quality of student engagement is just as important as the quantity, it is reasonable to accept that the students would benefit from a higher level of engagement in the learning task (Grant, 1983).

Results from other studies have suggested that more effective teachers are those that provide students with more ALT-PE. This study was able to increase ALT-PE, however, students were not measured for increases in skill level.

The teacher can influence the amount of ALT-PE students receive by using alternative skill practices and modifying some teacher behaviours. These increases in ALT-PE occurred with the teacher taking lessons of the same content.

The strength of the intervention given to the teacher is demonstrated by the increase in ALT-PE. The teacher, through assistance with goal setting, produced lessons with greater amounts of ALT-PE. It appears from this study that one
intervention may be adequate when attempting to increase ALT-PE. This is evident by the rapid increase in ALT-PE from the baseline phase. The amount of extra ALT-PE that students will receive throughout a whole year is very significant, presuming that the teacher can sustain his performance.

The findings of this study have implications for improving the quality of physical education teaching for preservice and postservice teachers. If greater student involvement is a high priority for teachers, then aspects such as ALT-PE may need to be investigated in order to improve the teaching-learning process. The effective interventionist needs to recognize and manipulate the influences on time as certain variables work separately or in concert to affect time outcomes in physical education (Metzler, 1989).

From this study, it appears that it is difficult to keep children actively engaged for more than 50% of the lesson. Due to the nature of physical education, managerial tasks that involve giving instructions for skills practices, and time taken in organizing students, all take up valuable lesson time. Some teacher behaviours have been shown to contribute to higher levels of student involvement. Organizing the lesson content effectively, and careful choices of skill practices and demonstrations has increased the amount of ALT-PE that one teacher provides students.

It is very difficult to identify the exact teacher behaviours which contribute to high levels of involvement. Some class behaviours adopted by the teacher were less effective than alternative behaviours. The effectiveness of a particular class behaviour depends on the circumstances prevailing. One behaviour can be more effective in some situations than in others. For example, partner activities may be more appropriate when practising the forehand shot, rather than a line of students waiting to hit the ball back to the teacher.
The way the teacher plans time within the lesson has an important bearing on the way students spend their time. A study carried out by Arrighi and Young (cited in Metzler, 1989) stated that 90% of preservice teachers and 5% of service teachers cited maximum student participation as an indicator of successful teaching. Teachers are more likely to make plans based on student enjoyment. There is a need to impress upon teachers the importance of planning the use of time in physical education (Metzler, 1989).

Recommendations

Intervention of ALT-PE in this study was effective in increasing a teacher's effectiveness. However, it is recommended that:

1. More research is done on increasing the time that children are engaged in the task. At present, results returning from studies suggest that far too much of the lesson time is being wasted in nonlearning time. Physical education teachers as a group need to become more aware of the importance of effective time management.

2. Preservice teacher education courses stress the importance of time utilization in physical education. More research needs to be conducted on the relationship of time to student achievement. The importance of ALT-PE in relation to teacher effectiveness needs to be clearly established amongst physical education teachers. Once the importance of ALT-PE is understood and teachers begin to place importance on it then the quality of lessons will improve in physical education.
3. The variable of maximum participation be promoted until it becomes a major aim of physical educators.

4. ALT-PE is used as the basis for an in-service package in schools and districts. This could be conducted by the principals, peer teachers or staff from the regional office in an attempt to increase the quality of physical education. The results from this study have shown how a single observer intervention can significantly increase ALT-PE.

5. Further studies may investigate differences in the amount of ALT-PE between teachers. Variables such as years of service, and educational levels could be considered.

6. The amount of ALT-PE that specialist Physical Education teachers provide be compared with that provided by generalist classroom teachers.
REFERENCES


APPENDIX 1
## ALT-PE CURRICULUM SHEET

|   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| s1 | C | - | T | - | TW | P | - | - | - | T | TW | P | - | - | - | T | - | Bn | - | - | W | - | C | OF | - |
| s2 | C | - | T | - | TW | P | - | - | - | T | TW | P | - | - | - | T | - | Bn | - | - | W | - | C | OF | - |
| s3 | C | - | T | - | TW | P | - | - | - | T | TW | P | - | - | - | T | - | Bn | - | - | W | - | C | OF | - |

### Context Level

<table>
<thead>
<tr>
<th>Critical Content</th>
<th>MI Knowledge</th>
<th>MI Motor</th>
<th>M Motor Engaged</th>
<th>MMotor Engaged</th>
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</thead>
<tbody>
<tr>
<td>Transition (T)</td>
<td>Technique (TH)</td>
<td>Still Practice (P)</td>
<td>Interim (I)</td>
<td>Motor appropriate (M)</td>
</tr>
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<td>Management (M)</td>
<td>Strategy (ST)</td>
<td>SeriMnognRoutine (S)</td>
<td>Waiting (W)</td>
<td>Motor inappropriate (H)</td>
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<tr>
<td>Break (B)</td>
<td>Rules (R)</td>
<td>Core (C)</td>
<td>Off-task (O)</td>
<td>Supporting (S)</td>
</tr>
<tr>
<td>Warm Up (WU)</td>
<td>Social Behavior (SB)</td>
<td>Fitness (F)</td>
<td>Non-task (N)</td>
<td>Cognitive (C)</td>
</tr>
<tr>
<td></td>
<td>Background (B)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Learner Involvement Level

|   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| s1 | C | - | T | - | TW | P | - | - | - | T | TW | P | - | - | - | T | - | Bn | - | - | W | - | C | OF | - |
| s2 | C | - | T | - | TW | P | - | - | - | T | TW | P | - | - | - | T | - | Bn | - | - | W | - | C | OF | - |
| s3 | C | - | T | - | TW | P | - | - | - | T | TW | P | - | - | - | T | - | Bn | - | - | W | - | C | OF | - |

### Appendix

ALT-PE INSTRUMENT
How to Read the Sample Coding Sheet

ALT-PE coding provides a symbolic "script" of a lesson. With a little experience, a completed coding sheet can be easily "read" to provide a narrative description of what went on during a lesson. The sample lesson would be read as follows. (The "reading" goes down column 1 for S's 1, 2, and 3 and then across to column 2. The upper half of the coding sheet is the first half of the lesson. The bottom half of the coding sheet is the second half of the lesson.)

The lesson began with a managerial sequence which lasted for 7 intervals. This was followed by a rather lengthy transition episode (9 intervals which represents almost 2 1/2 minutes in the 8 second observe 8 second record format used here). There is then a brief focus on technique which is followed by a lengthy practice episode. A brief transition followed by another brief focus on technique is then followed by a second practice episode. A short transition then leads to an episode focusing on background material which leads into a brief session on rules. The remainder of the lesson is spent in a game context with a transition (to change teams). The lesson ends with a managerial episode.

There is some waiting during the transition episodes. S-1 was off task several times. S-2 didn't have the skills to actually play the game appropriately. When the teacher was giving information (technique, background, or transition) the students generally attended. The students were basically on task during the management and transition episodes, but typically had to wait after completing the transition tasks.

The lesson is a fairly typical team sport lesson. Only 27% of the intervals were ALT-PE intervals. Students moved from a practice task to a game context with no scrimmage opportunity.

(Siedentop et al. 1982, pp. 2)
ALT-PE/SPORT INSTRUMENT

ALT-PE/SPORT

OBSERVATION

Teacher ___________________ School/Club _______ Grade/Age _______ Date __________

Activity/Sport _______________ Start ___ Stop ___ Class _______

Observer _______________________

Key Behaviours:

Management (M) - related to class business, unrelated to instructional activity
Transition (T) - managerial and organizational activities related to instruction
Waiting (W) - completed a task, period of no activity and no movement between activities
Knowledge (K) - listening to instructions, watching a demonstration, questioning, discussing
Activity (A) - engaged in motor activity
Off Task (O) ___________________

Critical Incidents: ______________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

Other Comments: ______________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________

_____________________________________________________________________
# APPENDIX 3

## REVISERD ALT-PE/SPORT INSTRUMENT

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Grade</th>
<th>Date</th>
<th>Activity</th>
<th>Start</th>
<th>Stop</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Observer**

### Key Behaviours:

- **Management (M)** - related to class business, unrelated to instructional activity, e.g., taking attendance, discussing a field trip.

- **Transition (T)** - management and organisational activities related to instruction, e.g., such as team selection, changing equipment from one space to another, and changing activities within a lesson.

- **Waiting (W)** - completed a task, period of no activity and no movement between activities, e.g., waiting in line for a turn, or on a playing team but not actively involved.

- **Knowledge (K)** - listening to instructions, watching a demonstration, questioning, discussing, e.g., engaged in a cognitive task such as listening to a teacher describe a game, watching a demonstration, participating in a discussion, or watching a film.

- **Activity**
  - engaged in motor activity.
  - warm up exercises.
  - Performance - activity relating to the objectives of the lesson.
  - activity is being performed with very little success.
  - Supportive - Active in a supportive role.
  - Inappropriate - Activity does not relate to the objectives of the lesson.

- **Off Task (O)** - a child not engaged in an activity s/he should be engaged in, e.g., behaviour disruptions, misbehaviour or talking when the teacher is talking.
APPENDIX 4
# APPENDIX 4

## CODED ALT-PE/SPORT INSTRUMENT

**ALT-PE/SPORT INSTRUMENT**

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Grade</th>
<th>Date</th>
<th>Activity</th>
<th>Start</th>
<th>Stop</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6</td>
<td>Sept 12th 1989</td>
<td>Mini Tennis</td>
<td>9:30</td>
<td>10:00</td>
<td>Lesson 4</td>
</tr>
</tbody>
</table>

**Observer:** WALKER

**Key Behaviours:**

- **Management (M):** related to class business, unrelated to instructional activity, e.g., taking attendance, discussing a field trip.
- **Transition (T):** management and organisational activities related to instruction, e.g., such as team selection, changing equipment from one space to another, and changing activities within a lesson.
- **Waiting (W):** completed a task, period of no activity and no movement between activities, e.g., waiting in line for a turn, or on a playing team but not actively involved.
- **Knowledge (K):** listening to instructions, watching a demonstration, questioning, discussing, e.g., engaged in a cognitive task such as listening to a teacher describe a game, watching a demonstration, participating in a discussion, or watching a film.
- **Activity:** engaged in motor activity.
  - **(A1):** warm up exercises.
  - **(A2):** performance - activity relating to the objectives of the lesson.
  - **(A3):** activity is being performed with very little success.
  - **(A4):** supportive - activity in a supportive role.
  - **(A5):** inappropriate - activity does not relate to the objectives of the lesson.

**Off Task (O):** a child not engaged in an activity s/he should be engaged in, e.g., behaviour disruptions, misbehaviour or talking when the teacher is talking.
### APPENDIX 5

**CLASS ANALYSIS SHEET**

<table>
<thead>
<tr>
<th>Lesson Time</th>
<th>Anecdotal Description of Teacher Behaviours</th>
</tr>
</thead>
</table>

---
APPENDIX 6
<table>
<thead>
<tr>
<th>Lesson Time</th>
<th>Anecdotal Description of Teacher Behaviours</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.54</td>
<td>Equipment distribution, relatively quick (maybe activity while waiting) or explain what to do before entering court so that equipment could be gathered and activity begins rather than allowing talking once whole class is spread out.</td>
</tr>
<tr>
<td>8.57</td>
<td>Could all children have a bat and leave it at their feet while supporting. Good practice formation but is supporting a partner the best use of activity time?</td>
</tr>
<tr>
<td>9.00</td>
<td>High Practise time given. Perhaps use sick people as back ups? Good amount of activity time given.</td>
</tr>
<tr>
<td>9.01</td>
<td>Children gone and collected the equipment that could have had at the start. (time wasted).</td>
</tr>
<tr>
<td>9.03</td>
<td>Good skill progression - high in activity time.</td>
</tr>
<tr>
<td>9.04</td>
<td>Putting equipment back that could be used to save transition time during skills practice.</td>
</tr>
<tr>
<td></td>
<td>Walking up giving bat to a partner wastes time.</td>
</tr>
<tr>
<td>9.08</td>
<td>Knowledge - good short explanation of common error.</td>
</tr>
<tr>
<td>9.10</td>
<td>Putting equipment away - 2 min 10 sec (wasted time)</td>
</tr>
<tr>
<td>9.13</td>
<td>Cool Down activity.</td>
</tr>
<tr>
<td></td>
<td>Practice formation front person kneels down when teacher (T) talks.</td>
</tr>
</tbody>
</table>
APPENDIX 6 (Continued)

CLASS ANALYSIS

<table>
<thead>
<tr>
<th>Lesson Time</th>
<th>Aecdotal Description of Teacher Behaviour</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.32</td>
<td><strong>Warm Up.</strong></td>
</tr>
<tr>
<td></td>
<td>* Explanation was short, activity began immediately.</td>
</tr>
<tr>
<td>9.34</td>
<td><strong>Gaining Equipment.</strong></td>
</tr>
<tr>
<td></td>
<td>* Children only needed to go to equipment bin once.</td>
</tr>
<tr>
<td></td>
<td>* Once children obtained equipment they had a task to do rather than waiting.</td>
</tr>
<tr>
<td></td>
<td><strong>Activities.</strong></td>
</tr>
<tr>
<td></td>
<td>* Pat bouncing and racket control has obvious high act time.</td>
</tr>
<tr>
<td></td>
<td>* Short whistle blows to mean 'stop and eyes here' works well. Good short explanation in 5-10 secs to change activity and give feedback.</td>
</tr>
<tr>
<td></td>
<td>* Activities were successfully broken up with feedback.</td>
</tr>
<tr>
<td></td>
<td>* Activity time increased.</td>
</tr>
<tr>
<td></td>
<td><strong>Demonstrations</strong></td>
</tr>
<tr>
<td></td>
<td>* Demonstration circle works well.</td>
</tr>
<tr>
<td></td>
<td>Children move to that position very quickly with minimum transition time.</td>
</tr>
<tr>
<td></td>
<td>* Ensure that the following practice is explained before children move off, so that activity can begin immediately.</td>
</tr>
<tr>
<td></td>
<td><strong>Partner Activities.</strong></td>
</tr>
<tr>
<td></td>
<td>* Excellent combination of skills taught.</td>
</tr>
<tr>
<td></td>
<td>Both children in partnership were involved in the activity in a competitive situation rather than one child supporting.</td>
</tr>
<tr>
<td>9.50</td>
<td><strong>Serving Demonstration</strong></td>
</tr>
<tr>
<td></td>
<td>* Change from &quot;knowledge&quot; to Motor Activity by getting children actively involved with a step through demonstration.</td>
</tr>
<tr>
<td>9.51</td>
<td>Far less time was wasted when both children have a bat and don't waste time giving bat to partner. Excellent.</td>
</tr>
<tr>
<td>9.55</td>
<td>Good idea of yours using the supporting child to hit the ball rather than throwing it - (ALT-PE increases)</td>
</tr>
<tr>
<td>9.59</td>
<td>Activity related to lesson to conclude and put equipment away.</td>
</tr>
</tbody>
</table>