INTRODUCTION

In Western Australia, most early childhood teachers are aware of the need to give serious thought to the place of computers in pre-primary centres. Undeniably computers are part of the general environment and will play an increasingly important role in young children's lives in the future. What understanding do five year olds have of computers? To what extent are children aware of the existence and use of computers? Do they have any understanding of what computers can do? Are their feelings towards the use of computers positive or negative? These are some of the important questions we felt should be considered by an Early Childhood teacher when formulating a policy on computing.

Using a research method called the Drawing and Focussed Interview technique (Burgess, 1989; Kutnick, 1978), data was gathered from 94 children at three different metropolitan pre-primary centres. This method involved asking children to draw a picture of a computer as the initial stage of an interview. From the drawings, the interviewer was able to focus on certain content questions to determine the awareness, understanding, experience and feelings of the children towards computers. The children were asked to name the parts of the computer they had drawn, describe how the computer worked and what computers actually did. They were also asked what they would do if they were given a computer. The number of children who had access to computers outside of school hours was also easily recorded by this drawing/interview technique.

BACKGROUND

For this survey three quite different pre-primary centres were chosen; a semi-rural centre on the outskirts of Perth, an inner city priority centre and a suburban centre with a mixed socio-economic status. Each centre had one teacher in charge and a teachers aide. They catered for five year old children who attended four half day sessions per week.

Only the semi-rural centre had a computer set up for the children to use on a regular basis during free choice activity time. The other two centres had access to computers but had not started their computing program at the time of the study. Each pre-primary centre was part of a primary school. Each of the three primary schools had computer programs operating for children in the older grades.

In each of the three centres, the teachers' attitudes were representative of many Western Australian pre-primary teachers to whom we have talked. Many teachers feel that they are faced with the challenge of making decisions about the use of computers in an early childhood setting. With limited resources and knowledge but stimulated by the work of such people as Blemings (1985, 1986, 1987, 1988) cited during inservice courses, they were enthusiastic about computers in the pre-primary situation. Our survey was intended to provide an information base for these teachers about their children's existing knowledge, perceptions and experiences with computers.

RESULTS

An analysis of the children's drawings and language use during the interview revealed some interesting information.

Awareness and Understanding

In assessing the children's awareness and understanding of computers we first established whether or not the children had access to computers out of school. Refer to table 1.

Bearing in mind these 4–5 year old children were from families in the middle to lower socio-economic groups the teachers were surprised to find that between 30 to 60 percent of the children in each group had access to a computer out of school hours. The drawings and responses from these children gave quite detailed information about their perceptions of computers.

Looking at the drawings, table 2 shows the three categories into which the drawings were classified. The lowest classification of drawings represented children who could neither draw a computer nor give meaningful responses to the questions about computers. It should be noted that drawings were tabulated from only Centre 2 and 3 for the low group, as at Centre 1 all children were using the computer in the pre-primary at the time of the study and could draw and respond to questions.

The medium group were those children who had an understanding of
TABLE 1: Out of school access to computers

<table>
<thead>
<tr>
<th>Centre</th>
<th>Area</th>
<th>Group Fraction</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>small semi-rural</td>
<td>6/17</td>
<td>35%</td>
</tr>
<tr>
<td>2</td>
<td>Inner city priority</td>
<td>8/15</td>
<td>53%</td>
</tr>
<tr>
<td></td>
<td>group 1</td>
<td>9/15</td>
<td>60%</td>
</tr>
<tr>
<td>3</td>
<td>suburban mixed</td>
<td>13/25</td>
<td>52%</td>
</tr>
<tr>
<td></td>
<td>group 1</td>
<td>7/22</td>
<td>32%</td>
</tr>
<tr>
<td></td>
<td>group 2</td>
<td>33/94</td>
<td>35%</td>
</tr>
</tbody>
</table>

Table 1

By contrast children with little experience of computers described the keys as buttons and the screen as a television or box and could not differentiate parts of the machine.

FEELINGS

Challenged by a controversial article by Klein (1988) which asserted that young children felt intimidated by computers, the data was examined for examples of negative feelings. No Table 2

![Figure 1. Examples of drawings from children with low awareness.](image1)

Examples in the second group shown in figure 2, were representative of the medium group of pre-primary children who were able to draw the screen and keyboard with buttons in a systematic pattern. They had an understanding of the 'cause and effect' relationship, that is pressing something to make the computer work and that something happens on the screen. There was no differentiation between the keys within this group.

![Figure 2. Examples of drawings from children with medium awareness.](image2)

Examples in the third group were classified as having a high awareness of the computer. This group quite clearly had access to a computer out of school hours. The children showed that they were aware of the functions of a computer, that is, it can be controlled, moved (by mouse) or show things on the screen and were able to describe the process in some detail. (See figure 3.)

LANGUAGE

Tallies of vocabulary used by the children in different classes showed that correct terminology was used by those children who had a good awareness of the computer. Words such as keyboard, screen, disk, disk drive,
and draw. They all appeared to have a very positive attitude towards computers. For example in response to the question ‘If you were given a computer what would you do’ the replies were typically ‘play games’. Only one child refused to draw or talk about computers.

The majority of children stated that the computer was used to play games with and viewed the computer as a machine for entertainment, regardless of home/school use. Only twelve percent of the total suggested the computer being used for word processing, that is, writing their name, letters and numbers or story writing. Very few children had the understanding that the computer was used as a tool. Only eight children discussed their parents use of the computer in relation to work. Six children were aware that computers were found in shops as well as in homes.

CONCLUSION
From this survey we found that many children as young as four have established perceptions about computers and have an awareness of their use. The children are not only aware of the existence of computers in the home environment but seem to use the term ‘computer’ in association with electronic entertainment or games. At no time during the study did we discern any negative feelings towards computers. From the descriptions of the children’s activities with computers, it seems that the types of software available at home for children appear to have contributed to the positive attitudes which were expressed by these children.

The level of understanding within the surveyed group varied enormously. At the lower end of the spectrum computers played no part in the lives of some children. As a contrast, other children had the vocabulary and understanding to draw and discuss computers in detail. An interesting finding was that in Centre 1 where the computer was in use daily (set up as a free-choice activity) only the children with access to computers out of school had a high awareness.

With the relative cost of computers decreasing and the clever advertising campaign increasingly influencing home markets, more and more children are now exposed to computers at home. Obviously the experiences and awareness of children would vary from school to school and one cannot generalise from just one study, but it does appear that out of school access to computers influences the under standings and awareness of young children. When introducing computers to young children in early childhood settings, educators need to be aware of the range of perceptions already in existence.

REFERENCES


