Gender and social comparison effects in computer-based problem solving

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Abstract

Gender differences in relation to school children's learning with computers are frequently attributed to a tendency for boys to dominate computer resources in mixed sex settings. However, the evidence relating to children's performance with computers in mixed sex groups is conflicting. This paper reports two experimental studies in which 11- to 12-year-olds worked on a computer-based problem solving task. In the first, 62 children worked in either same or mixed sex dyads, but each child had her or his own computer, and no verbal interaction was allowed. Boys out-performed girls overall, with sex differences becoming significantly more polarised in the mixed sex dyads. The second study involved 96 children, with individual pre- and post-tests, and compared co-action dyads (as in the first study) with interaction pairs, in which the pair members worked together at a single computer, with no restriction on interaction. The polarisation of sex differences in the mixed sex dyads was once again found in the co-action condition, but not in the interaction condition. Results are interpreted in terms of processes of social comparison, which appear to be more potent in this situation than any straightforward domination of resources. © 2000 Elsevier Science Ltd. All rights reserved.

1. Introduction

The issue of gender differences in relation to computer-based learning has attracted considerable attention in recent years, both in the media and from researchers. It has been widely recognised that the increasing role of new technology in both educational

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and work settings is potentially divisive in its effects (e.g. Laboratory of Comparative Human Cognition, 1989). Gender differences in expressed attitudes to computers are evident at all school age levels (e.g. Todman & Dick, 1993). In terms of recruitment to courses with a substantial computing element at upper secondary and tertiary levels, the imbalance in favour of males appears to be increasing rather than decreasing with time (e.g. Hoyles, 1988; Newton & Beck, 1993; Littleton & Bannert, 1999). There is no shortage of possible explanations for these findings, but one popular argument (e.g. Newton & Beck, 1993) has focused upon the tendency of boys to dominate the limited resources typically available in the school, excluding and/or 'hassling' the girls. Culley (1988, 1993) points to the apparently greater enthusiasm for computers shown by girls in single-sex schools as compared to mixed schools. Newton and Beck and others have argued that in mixed sex schools the best way to protect girls' interest in computers is to create girls-only groups for this area of the curriculum.

Thus, as Littleton (1996) notes in a relevant review, a strong argument has built up that the processes involved when working with computers in a co-educational setting represent an important factor in girls' aspirations and achievements in this field. The tendency for boys to dominate computer resources has been established both on the basis of classroom studies (Carmichael, Burnett, Higginson, Moore & Pollard, 1986; Culley 1988, 1993) and experimental studies (e.g. Barbieri & Light, 1992). Barbieri and Light showed that in mixed sex pairs of 11-year-olds the boys tended to sit where they could better access the mouse, and then controlled the interface for the great majority of the time. However, this did not mean that the girls were uninvolved in the task, and in fact the learning outcomes for the girls (indexed by individual post-test performance) turned out to be no worse than for girls in single-sex pairs.

Our subsequent experimental research, using specially authored problem solving tasks requiring extensive information searching and planning, has established that, even though mixed sex pairs tend to be less popular with the participants, the 11- to 12-year-old children involved seem to perform at very much the same level, and learn just as much as other children working in single sex pairs (Littleton, Light, Joiner, Messer & Barnes, 1992; Light, Littleton, Messer & Joiner, 1994). Other experimental studies involving mixed sex pairs have likewise in the main found no difference in terms of performance on learning outcome between these and single sex pairs (e.g. Hughes, Greenhough & Laing, 1992). In the Hughes et al. study, conducted with primary school children using LOGO, the boys consistently outperformed the girls. However, in four of their five studies the girls were neither advantaged not disadvantaged by working with a boy rather than another girl. In the fifth study the girls were actually advantaged in the mixed sex pairs.

There is something of a disparity, then, between the available evidence relating to children's performance in mixed sex pairs under experimental conditions and the wider literature suggesting that the presence of boys may be deleterious to the performance of girls in this area. In this paper we report two experimental studies which further explore the effects of having a same-sex or opposite-sex partner upon children's problem solving performance.