Roles of Parents in Fostering Technological Fluency

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Abstract: In this poster we share results from a study focusing on parent roles in learning, part of a larger research project describing conditions that support the continued engagement of middle school students in projects that use new media technologies. We identify ways in which parents can support their children's pursuit of digital media skills, and analyze roles that vary as a function of the child's gender and experience level with activities that build technological fluency.

Introduction

The digital divide is shifting from a split in access to a split in participation (Jenkins, 2006). Yet in the discourse around equitable access to technology and the skills needed to use it, little attention has been paid to the critical role of parents in fostering their children's participation. If children born after 1985 are seen as "digital natives," while their parents are "digital immigrants" (Prensky, 2001), there may be a belief that parents have little to offer their children in terms of skills with digital media. However, the importance of the support of others to early interest development in general has been well documented (Hidi & Renninger, 2006).

This poster extends a study that focused on parent roles in learning where we obtained rich interview data from eight students and their parents that allowed us to characterize the role of specific resources in their learning histories (Barron, Martin, Takeuchi, & Fithian, 2008). We were able to reliably differentiate seven parent roles that were instrumental for children's learning and project work: teaching, collaborating on projects, providing non-technical support, brokering learning opportunities, providing learning resources, learning, and employing their children to assist with technical projects.

This interview-based study revealed that within our small group of learners, all with high levels of access to computing tools and parents with domain expertise, there were differences in the quantity and quality of parent involvement. There was substantial variation in the range of roles played by either parent, the total number of roles played by both parents, and the number of unique examples that were discussed. These differences in range and number of roles were linked to gender. The parents of the boys in our sample played a greater number of roles (i.e., the number of roles played by mothers added to those played by fathers) and played a greater range of roles (i.e., more types represented) than the parents of girls. These gender-linked patterns raise questions about the origins of informal teaching and co-learning relationships.

In order to investigate this pattern in a larger sample, we surveyed 35 middle-school students about the roles their parents played in their technology learning. In this poster, we look at (1) how the number of roles filled by a parent differs across student gender and technology fluency building experience, and (2) how parents of boys and girls and students who with more and less experience differ in the types of roles they play.

Methods

Participants: Thirty-five students enrolled in a summer school elective course entitled "Multimedia, Internet & Web Page Design" in a suburban neighborhood in the San Francisco Bay Area. The 19 boys and 16 girls ranged in age from 10 to 14, with a mean age of 11.8 years. The level of access to technology was high; every student reported having Internet access and anywhere from 2 to 7 computers at home.

Prior experience with activities in which students created with technology varied. Using 16 activities considered to have fluency-building potential, such as making a digital movie or publishing a website, we created a *fluency breadth score* representing students' prior experience with technology. Students were classified as high- or low-experience based on a median split of fluency breadth (Barron, 2004). In our sample 65% of the boys and only 38% of the girls were high-experience, but a Chi-square analysis showed the association between gender and experience was not statistically significant ($\chi^2(1, N=30)=2.04$, $p=.15$).

Measures: Students responded to a survey item "For each description, check if a parent has ever played this role." In the survey, we also explored one of the roles, resource provider, in more detail. Breaking this role into three parts—buying learning tools, buying entertainment, and lending the parents' own resources at home—brings our total number of roles to nine.

Results

To look at the relationship of gender and experience level to the number of roles played by at least one parent (mother OR father), a univariate ANOVA was carried out with gender and experience level as the

between subject factors. Of the 30 students who responded to the experience survey items, 16 were classified as high-experience and 14 as low-experience. This analysis yielded a main effect of experience level $F(1, 26)=4.13$ $p=.05$. Students with greater experience reported significantly more parent roles filled ($M=7.02$, $SD=2.27$) than those with less experience ($M=5.27$, $SD=2.43$). There was no main effect of gender ($F(1, 26)=1.39$, $p=.25$), and no interaction between gender and experience.

We also examined the relationship of gender and experience level to the total number of roles played by both parents (mother AND father), again using a univariate ANOVA with gender and experience level as the between subject factors. This analysis yielded a main effect of gender $F(1, 26)=3.62$, $p=.07$, approaching significance. Boys reported more parent roles overall ($M=9.74$, $SD=3.80$) than girls ($M=7.10$, $SD=3.72$). There was no main effect of experience ($F(1, 26)=2.09$, $p=.16$), and no interaction between gender and experience.

Specific roles showed differences as well (see Table 1). Significantly more boys than girls reported that a parent played the role of a *lender*: "Has resources at the house that I use." Significant differences appeared between high- and low-experience students in the roles of *learning broker*: "Looked for technology-related activities for me to participate in and/or signed me up for them" and *employer*: "Paid me money to do something technical or on the computer for her/him." High-experience students also reported more often that a parent was a *learning tool purchaser*: "Bought me things to support my technology activities and learning."

Table 1: Percentage of students reporting that at least one parent filled role supporting technological activities.

	% boys	% girls	χ^2	p	% high	% low	χ^2	p
Learning broker	74	88	1.04	NS	100	57	8.57	< .01
Teacher	84	75	.46	NS	75	86	.54	NS
Collaborator	47	31	.94	NS	56	36	1.27	NS
Learning tool purchaser	84	63	2.14	NS	88	57	3.52	.06
Entertainment purchaser	89	75	1.28	NS	88	79	.43	NS
Lender	84	38	8.12	< .01	69	57	.43	NS
Non-tech support	84	63	2.14	NS	88	64	2.25	NS
Employer	47	44	.04	NS	75	21	8.57	< .01
Learner	74	69	.10	NS	88	64	2.25	NS

Discussion

These findings underscore the importance of considering parents' roles when seeking to provide equal access to technological fluency. Parents do not need to provide direct technical expertise in order to support their child's acquisition of digital media skills. Roles such as collaborator, non-technical supporter, learning broker, resource provider, learner, and employer all provide crucial support for the child's self-directed learning.

The larger survey sample supports the original finding that the roles parents play in their child's learning about technology may differ by the child's gender. Parents of boys fill more roles on average than parents of girls. More boys than girls report that parents lend their own resources.

In the larger sample, we also find that the number of roles that parents fill relates to the level of their child's experience with technology. Highly experienced students in our sample reported significantly higher numbers of roles filled by their parents than low-experience students. The roles of learning broker and employer are significantly more common among parents of students with high levels of fluency-building experience.

References

Barron, B. (2004). Learning ecologies for technological fluency: Gender and experience differences. *Journal of Educational Computing Research*, 31(1), 1-36.

Barron, B., Martin, C.K., Takeuchi, L., & Fithian, R. (2008). Parents as learning partners in the development of technological fluency. Manuscript under review.

Hidi, S. & Renninger, K.A. (2006). The four-phase model of interest development. *Educational Psychologist, 41*(2), 111.

Jenkins, H., Clinton, K, Purushotma, R., Robinson, A.J., & Weigel, M. (2006). *Confronting the challenges of participatory culture: Media education for the 21st century* White Paper. Chicago, IL: The MacArthur Foundation. Retrieved April 24, 2007.

Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon* NCB University Press.

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