Findings

Kinds of algorithms explored during SCAT experience to date

Scholars described creating many different algorithms in their games, not only in terms of the rules and procedures (e.g., "...we created algorithms for the rules and instructions for the proper way to play our game"), but also to implement game functionality in SCRATCH (e.g., "I used the timer for my game, and the coordinates for a character to go to a certain place when the game switches levels", or "Ones that make the character move from one place to another. Also, when the character touches the coins then the coins will go away"). In addition, Scholars also described exploring algorithms during their SCAT experience outside of game design. For example, for a field trip, the Scholars designed and built clocks using wood, a laser cutter, and a clock mechanism (e.g. "I made [a] clock and we had to put [it] together on the computer then got to see how it looked in real life, and I thought that was cool").

What Scholars liked and disliked about game design

Overwhelmingly, Scholars perceived game design as a creative endeavor that was fun and involved problem solving, both in terms of designing and implementing the game (e.g., "I like [game design] because it's fun and allows you to express your imagination to the game that you are designing", "I like that I get to be creative with my game", or "I like doing the game designing because I enjoy having to figure the things out"). All of these aspects of game design (i.e., game design being creative, fun, and involving problem solving) were aspects that thirty-eight percent (38%), thirteen percent (13%), and another thirteen percent (13%), of Scholars reported liking about game design, respectively. However, Scholars (twenty-six percent (26%)) disliked debugging their games and disliked the amount of time it took to design and implement games (seventeen percent (17%)). Scholars also described other aspects of game design they disliked including: having to work hard, not being able to implement as much of their games as they hoped, using SCRATCH for a second year to implement their games, and sitting in front of a computer (nine percent (9%) each).

Scholars' perceptions of themselves as game designers

Throughout Season 1, Scholars learned a lot about not only game design, but also about the practices of game designers. The facilitator often mentioned that the activities they were engaging in were the same as game designers and that they themselves were game designers. However, the end of season evaluation responses revealed that none (0%) of the Scholars saw themselves as game designers. Scholars seemed to suggest that seeing themselves as game designers implied that they wanted to pursue game design as a career (e.g., "…because I just don't think [game design] is the career I want to have…", "I don't see myself as a game designer because I am not a gamer. I am really not into computer games to the point where I want to design them", "I do like how we made the games, but I don't like all the time it took up and that we had to keep redoing everything and have a lot of patience as we were working on a website with a lot of glitches [SCRATCH]. I also did not like the things we were using don't have some of the exact ideas that we had discussed over the summer camp. So, we had to morph our ideas to fit the computer preferences." Many Scholars suggested that, while they thought that game design was fun, at this point in their lives, they viewed game design more as a fun hobby than a future career.

By the end of Season 2, however, thirty-three percent (33%) of Scholars either currently saw themselves as game designers, considered game design as a possible career, or affirmed game design was their career of choice (e.g., "Maybe because I mostly want to go into animation so this would be leading me to that pathway to do what I want to do", "I do see myself as a game designer. I really enjoy creating games and I've learned so much in the SCAT program so I want to continue to learn and create games that other people can enjoy", or "yes, my ideas and creativeness could be useful"). This suggests that some Scholars' are beginning to see, or already see, alignment between game design and their talents, interests, and future career goals. Further, this finding suggests that their SCAT experiences have impacted some of the Scholars' desire to pursue game design as a career.

Scholars also reported applying, sharing, and showcasing the skills, capabilities, and practices they acquired and developed during SCAT to other settings ranging from school (e.g., "We had an assignment in class, and I got to pull up my game", "In school we had to kind of do something like creating a game" or "…when it was the national day of code I showed my math teacher my game and all the code we did") to community organizations like Girl Scouts (e.g., "Yes, me and [my partner] are doing a girl scout competition where we teach girls in elementary school about coding in order to win a trip to California") and other technology focused activities (e.g., "…I shared what I knew to my robotics camp"). Scholars also described teaching their family members about game design (e.g., "I have taught some [of] my family members. I also practice [game design] on my own") as well as the impact that their SCAT experience has had on their own problem solving strategies and practices (e.g., "…[SCAT] may help me to think out my problems to see what is wrong").

Conclusions and implications

This paper describes the SCAT project and explores Scholars' perspectives of their SCAT experience and perceptions of themselves as game designers. Most exciting is the growing shift of Scholars' perceptions of themselves as game designers, as it suggests that Scholars' SCAT experiences are having an impact not only on the development of their CAT capabilities, but also in the way that Scholars view themselves and what they are capable of. However, this shift also suggests that changes in perception that can impact choices can take a long time to occur. In fact, it was only during the second year that this shift began to take place. Learners need to have not only opportunities to acquire and develop skills, capabilities, and practices, but they also need time to reflect on those opportunities and experiences and assess whether and how they connect to their own interest, goals, and aspirations. As we engage in the third and final year of data collection, we will continue to explore shifts in Scholars' CAT capability development as well as their understanding of CAT and the continued impact of the SCAT program on their perceptions of themselves as game designers, problem solvers, and critical thinkers.

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