Saving Face While Geeking Out: Video Game Testing as a Justification for Learning Computer Science

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Why would individuals who are capable of learning opt not to? Learning is important for stability and success. It would seem rational that students in groups that are frequently underrepresented or marginalized would be motivated to learn. However, negotiation of multiple identities and self-beliefs can impact motivations to learn.

For example, young African American males frequently adopt a “cool pose” in their approach to education. They maintain that they do not care and will not try to be a part of the existing educational system. To better understand these issues, we studied African American males in the Glitch Game Testers program. High school students in the Glitch program worked as paid game testers and took workshops in computer science. More than 65% of the participants went on to study computing after high school. We found that these students persisted with education and computing because they navigated around motivations to not learn by creating many different faces for their involvement with Glitch. In this article, we explore the use and design implications of face-saving tactics these young men used to “geek out” on computer programming, choose computer science for their career, and maintain their current identities with friends and families.

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It is a peculiar sensation, this double-consciousness, this sense of always looking at one’s self through the eyes of others, of measuring one’s soul by the tape of a world that looks on in amused contempt and pity. One ever feels his twoness,—an American, a Negro; two souls, two thoughts, two unreconciled strivings; two warring ideals in one dark body, whose dogged strength alone keeps it from being torn asunder. (Du Bois, 1903, p. 9)

We all have multiple identities that we present to different groups (Goffman, 1956). For example, we may present our coworkers with a different side of our personality than our friends. Negotiating these multiple identities can cause conflicts for some groups. It is problematic when conflicting identities result in active motivation to not learn. As the quote above indicates, Du Bois’s theory of double-consciousness noted these conflicts within the African American community in 1903, yet our country still struggles with young African American males disconnecting with education and work (Edelman, Holzer, & Offner, 2006; Lee & Ransom, 2011). Unfortunately, in education we frequently expect and promote only a single face for what constitutes learning and success. That single face can conflict with many of the cultural identities that young African American males hold. We suggest that providing tactics for face saving in learning environments can offer one method for negotiating conflicting identities for those who are motivated to not learn. In this way, those motivated to not learn can participate in learning skills and acquiring knowledge that will assist in serving their goals while maintaining their identity with friends, families, or other groups.

In his book I Won’t Learn From You, Herbert Kohl (1994) described students who make an active choice to not learn even when they are capable of learning. Why would individuals who are capable of learning opt not to? Why would they make an active choice to not learn when learning is tied to stability and success? We contend that cultural values in conflict with values and expectations in the classroom motivate students to actively choose to not learn. We propose that this active choice to not learn needs to be better understood and addressed as a unique property of learning motivation.

Young African American males are identified as frequently unmotivated to succeed in a formal learning setting because they choose to reject identification with school (Cook & Ludwig, 1998; Ferguson, 2000; Majors & Billson, 1993). Content areas can result in similar rejections of learning, such as some students’ negative response to computer science (CS) subjects because they believe they are not capable of learning these subjects or because they desire not to be associated with such “geeky” subjects (Eglash, 2002; Margolis, 2008; Steele, Spencer, & Aronson, 2002).

A student’s motivation to not learn is rarely identified as a factor to be addressed in the design of learning environments. Kohl (1994) looked at the ways the cultural loyalties of students directly interfere with formal education
and highlighted the issue of active motivation to not learn. We assert that social-psychological interventions that address issues such as stereotype threat (Aronson, Fried, & Good, 2002) and cool pose (Majors & Billson, 1993) also address motivations to not learn. However, as Yeager and Walton (2011) argued, the design and implementation of social-psychological interventions to change these belief systems is poorly understood and difficult.

We address motivation to not learn in the context of a CS learning intervention with young African American males in order to understand how cultural issues and self-beliefs are negotiated to enable CS learning. The Glitch Game Testers is a group of young African American men who work as a quality assurance team on digital games. In addition, they spend time in CS workshops. Of the 23 high school graduates from the program we have tracked, 16 have enrolled in postsecondary programs for computing. We seek to understand why this group of young men persevered in CS, even when the field is often perceived as socially unacceptable among friends and family.

Glitch participants told us they first applied to be game testers because they needed jobs and being paid to play sounded like a dream job. They continued to give these justifications for participation to friends and family when asked about what they did all summer. However, we observed that the participants had moved beyond extrinsic motivations of money and fun seeking through game play, yet they continued to present themselves as only motivated by these factors. This choice of self-presentation seemed to be a face-saving (Goffman, 1956) tactic, or a method for protecting the participant’s presentation of self when threatened by the identity of wanting to learn or identify with CS.

To further explore face-saving tactics, we used surveys and focus groups in which participants considered justifications for hypothetical situations related to their activities in Glitch. For example, they considered what the responses of their family and friends would be to different explanations of what it felt like to work on a college campus. They then rated and provided feedback on the level of acceptability of responses for different people in their lives. For instance, participants would inform family members that they “like getting experience being on a college campus.” They would tell their “geeky” friends, “It’s just a job.” When talking to the “popular kids” at school, they might say that it was a good way “to meet the ladies.” Our findings indicate that the participants presented different faces of Glitch to different people and that their representation of Glitch was nuanced, perhaps more nuanced than the African American male cool pose would suggest (hooks, 2003; Majors & Billson, 1993). These faces frequently contrasted with what the participants talked about enjoying or disliking in the program. Furthermore, the participants admitted misrepresenting their true feelings about the program.

We suggest that students began the program with cultural values and a presentation of self that conflicted with showing an interest in CS. In our planning stages,
the text of Herbert Kohl (1994) inspired us to use participatory design and code-
sign methods (Ehn, 2008; Nieuwma, 2004; Schuler & Namioka, 1993) to design
a learning intervention that did not conflict with the cultural values of our would-
be-learners. At the end of the program, students demonstrated a marked interest in
learning computing through multiple measures. As the Glitch program progressed,
we observed that the design process had, unintentionally, built acceptable face-
saving tactics into our intervention, allowing the young African American male
participants to get out with computing while maintaining their presentation of
self. Because of this success, we advocate designing learning interventions that
consider the values of participants and their families and friends, which may not
all be the same, allowing the participants to save face while participating and
developing an identity as a learner. This means developing learning interventions
that the learners will feel are impressive rather than simply looking for hooks to
engage young people in what designers feel is important. Game testing and the
prospect of being paid to play games was our initial hook to engage these young
men. But the young African American males in Glitch felt that having a job, being
on a college campus, and performing aspects of African American masculinity
were more important and impressive experiences to many people in their lives.

BACKGROUND AND FRAMEWORK

We began by looking at motivations to not learn. We found that cultural values and
maintaining presentation of self were important factors in the motivation to not
learn. As noted, Kohl’s work on cultural loyalties inspired us to be reflective about
culture from the beginning of the program. In addition, other literature addressed
cultural and social factors that contribute to disidentification with school, which
inhibits learning. CS serves as an example of a subject in which such cultural and
self-belief systems intertwine. Exploring these different understandings of moti-
vations to not learn highlighted a conceptual disconnect between efforts to create
learning opportunities that fit with students’ existing belief systems and creating
interventions to change students’ belief systems. One method we put forward for
navigating conflicting motivation is face saving.

Cultural Values and Presentation of Self

We define cultural values as strategies of action used by an individual based
upon the experiences, stories, rituals and worldviews to which he or she has been
exposed. These values shape how an individual acts and wishes to be seen in
the world (Swidler, 1986). How an individual wishes to be seen, or presentation
of self, can change in different circumstances. Presentation of self, as defined
by Goffman (1956), ties back to this idea of cultural values in that it examines
human actions as fundamentally social in nature, ranging from conscious and intentional communication to the less conscious expressions people “give off” through things like gestures and clothing. For Goffman, the expressions people consciously “give” and the expressions they unconsciously “give off” can be in symmetry or asymmetry with each other but culminate in a presentation of self. One aspect of the presentation of self is the concept of face or face saving in conflict situations. Face is the conscious façade that people present to an audience, the identity they try to protect in moments of embarrassment (Goffman, 1955). Saving face can be applied to saving one’s presentation of self or helping others maintain their presentation of self and protecting them from embarrassment. Conflict can occur when one face is expected and another is presented, such as in a classroom setting when a teacher expects a student to appear attentive (even if he or she is not interested) and the student prefers to appear inattentive (even if interested). Methods of face saving are strongly linked to an individual’s cultural values; in Asian cultures, for example, helping others maintain face is considered more important than maintaining one’s own presentation of self (Ting-Toomey et al., 1993). Studies of face saving among adolescents have noted that gender and country of origin play a significant role in how students save face with peers, family, and teachers (Juvonen, 2000).

Understanding Motivation to Not Learn

What happens when intrinsic motivations to learn are in direct conflict with a motivation to not learn? We sought out learning motivation literature that went beyond the motivations to learn and explicitly explored motivations to not learn. Previous work provided us with several explanations for why an individual would make an active choice to opt out of learning. These explanations ranged from a focus on culturally situated understandings, such as cultural loyalties or values, to more internalized belief systems, such as Dweck’s (2000) work on self-theories. Along this spectrum of external and internal influences, others have addressed specific reasons for what Osborne (1997) classified as disidentification with learning.

Cultural Loyalties. Herbert Kohl (1994) related his experiences in encountering students who, although capable of learning, chose not to learn because their cultural values were in direct conflict with the process of learning. He pointed out that deciding to actively not learn requires considerable skill and cunning. Kohl described a young African American male who chose to actively not learn in traditional educational settings because he believed these were racist institutions. Majors and Billson (1993) described this choice as the cool pose, whereby African American males engage in defensive posturing, rejecting schools and other institutions that they perceive as actively rejecting them. In Ogbu and Simons’s (1998)
cultural-ecological perspective, involuntary immigrants tend to perceive educational institutions as controlled by the group that oppresses them. In reaction to these factors, there is an active rejection of what are perceived as dominant values and culture passed along in their culture, which also leads to a rejection of school and positive academic identity. Outside of African American conflicts with the educational system one can find religious conflicts, such as the Texas Republican platform proposal that learning evolutionary sciences should be optional because it conflicts with the religious beliefs of many students (Mechler et al., 2012).

Disidentification. Similarly, Osborne (1999) explained Black male disidentification with education, an active rejection of any identification with education and educational institutions that is the result of stereotypes, cultural influences, and the active rejection of White culture. Work that looks at how racial and gender identity shapes self-theories includes work on stereotype threat (Steele et al., 2002). This work found that stereotypes have a twofold effect. First, stereotypes may encourage a belief (similar to fixed theory; Dweck, 2000) that race or gender predisposes an individual to do well or poorly in a particular subject. Second, the fear that if one performs poorly he or she will be reinforcing a negative stereotype undermines student confidence and, ultimately, student performance.

Prior research has shown that short interventions can change self-beliefs and impact learning (Aronson et al., 2002). Yeager and Walton (2011) reviewed a number of quick, effective, and lasting interventions to change students’ self-belief. Although they found that these interventions can be effective, they also found that they are difficult to implement and there is a lack of information about why an intervention works in one setting but not another. For example, the literature on teaching computer programming shows both unsuccessful (Simon et al., 2008) and successful (Cutts, Cutts, Draper, O’Donnell, & Saffrey, 2010) interventions to improve students’ self-theories.

Motivations to Not Learn CS. The low numbers of underrepresented students (women, African Americans, Hispanics, Native Americans, or persons with disabilities) who go on to study and persist in CS classes is evidence that learning CS holds particular challenges for those who are underrepresented in CS. The literature that explores why CS poses these challenges can be used as a case study for exploring motivations to not learn. According to Eglash (2002), geek stereotypes are intimately linked with race and gender to the extent that some members of minority groups find it difficult to participate in geeky activities like CS. Studies also note that gender and race have played a role in who chooses to persist in CS and who perceives CS classrooms as unwelcoming (Barker, Garvin-Doxas, & Jackson, 2002). Much of this distinction is tied to a disidentification
with computing. Margolis and Fisher (2002) found that gender was a significant factor in disidentification with computing.

The belief that some are naturally good at CS and others are not good at CS may be created and reinforced by an imbalance in content knowledge among students in introductory CS classes. Some young people have been programming and hacking since a very young age, whereas others have not seen code before their first CS class. This imbalance makes the CS classroom an opportunity for some students to show off their extensive knowledge rather than engage in a learning community (Barker et al., 2002; Margolis, 2008; Margolis & Fisher, 2002).

Navigating Learning Motivations With Face Saving

As noted earlier, there are successful strategies for changing or navigating around motivations to not learn. One example is insightful and reflective teaching that considers the cultural loyalties and needs of students, which can be seen in Kohl’s (1994) experience as an educator. Kohl gave examples of practices in the classroom that allowed students to save face. In one example, an uncooperative illiterate 6-year-old student was slyly provided the words he was asked to read aloud by the teacher. The student felt that he was “pulling one over” on the teacher and had the opportunity to demonstrate that he could read to his classmates (even though he could not). This allowed the student to maintain face that he could read and allowed him to seek help in learning to read without fear of being perceived as stupid.

The success of stealthy self-belief interventions (Yeager & Walton, 2011) demonstrates that by not openly trying to teach or change participants these interventions allow participants to maintain their presentation of self, or save face, even when changing their belief system. These examples of face saving are promising but are not systematic studies of face saving in relationship to motivation to not learn. The use of face saving in learning science research may offer two opportunities to help experts understand motivation to not learn. First, examining learning environments for face saving can expose conflicts between learning goals and student values. Second, by using this sort of analysis, designers or educators can focus not only on the underlying reasons why students choose to learn or not learn but also on the availability of justifications for students to participate in learning.

Students use a variety of methods to justify their good and bad performance. To examine the use of face-saving tactics, researchers have introduced hypothetical scenarios to subjects and obtained feedback on the acceptableness of various responses. This feedback is about how the study participants feel, and how they perceive other people in their lives would feel, about these various responses. This method of presenting scenarios has been used in realistic deception studies, as well as in interviews, focus groups, and surveys (Bond & Lee, 1981; Juvonen,
SAVING FACE WHILE GEEKING OUT

These findings have demonstrated participants’ different uses of face-saving tactics and the repercussions of these tactics. For example, students who use the excuse of “bad luck” for their CS course performance will more likely fail in CS classes (Wilson & Shrock, 2001). For those who performed poorly, a lack of work or effort was frequently the excuse (Juvenon, 2000). In similar work on self-handicapping, Urdan, Midgley, and Anderman (1998) found that students did not prepare for tests as a method to deflect attention away from performance (both good and bad performance). Using methods from these previous studies to better understand face saving in learning environments may help us to build theory around face saving as a method for navigating conflicting motivations.

RESEARCH ENVIRONMENT AND METHODS

This study was conducted in the context of the Glitch Game Testers, a program created to increase young African American males’ interest in CS by leveraging their passion for video games. First we briefly describe the formative and design work and the Glitch program, and then we describe the research methods used for assessment and in the face-saving study.

Although several different methods were used in the study of Glitch, all of them were considered part of a qualitative paradigm for inquiry. Four constructs—credibility, transferability, dependability, and confirmability—are components of this paradigm (Lincoln & Guba, 1985). Credibility was established by situating our research as participant observers in a prolonged and persistent interaction with the participants. Transferability, rather than generalizability, addressed the problematic nature of applying qualitative findings to other settings. Focusing on design implications places the burden of transferability to the investigator who would make the transfer rather than with the original investigator (Marshall & Rossman, 1989). Dependability was reflected in descriptions of how Glitch changed over the course of 3 years and observations and interview data that reported on participants’ reactions to this dynamic environment. This is in contrast to a quantitative lab study that would not account for changes in the environment or subjects. And finally, confirmability was established through the data presented and the triangulation of multiple methods to confirm the findings in that data.

Formative Studies and Design Research

The formative work for Glitch documented that the heavy use of video games by young African American males failed to correlate with the accepted notion that “hardcore” video game players often become interested CS. Early work explored the way in which young African American men tended to play games differently.
from the young men who turned their gaming into an interest in CS (DiSalvo & Bruckman, 2010). We found that young African American men tended to play games similarly to the way in which they played sports, accepting rules as unchangeable and valuing sportsmanship and competition. CS majors told us about their interest in hacking and modifying game mechanics, writing strategy guides, and being a part of small game communities (DiSalvo & Bruckman, 2009). It seemed that these practices, rather than the actual game play, encouraged players’ agency with the technology and allowed them to see computers as tools and as a possible career interest area. In contrast, young African American men perceived hacking, modifying games, and using strategy guides as signs of weakness in one’s skills and possibly as signs of weakness as a person (DiSalvo & Bruckman, 2010). This finding challenged us to find a way to allow these young men to gain agency with the technology without violating their values.

Game testing was an obvious choice for allowing the participants to look inside digital games, to see games as computation over which they could have agency. In addition, game testing provided a number of opportunities to meet the design requirements discovered in our formative design work. For example, we found that young African American males tend to place a strong value on being paid for their work and making an impact on real-world products. They valued effort toward these practical applications rather than learning or creating for general self-improvement or curiosity. Because game testing is a legitimate job, one that the testers felt was impressive to their friends and family, we compensated them for their time and created a real-world work environment.

The Context of Glitch

The high school participants in Glitch worked full time in the summer and part time in the school year as game testers, doing quality assurance work on prerelease digital games for industry clients. These testers also participated in CS workshops and classes that were contextualized using digital media and other interests of the testers. Other elements of Glitch included gaining experience working on a college campus and a competitive point system. Glitch Game Testers launched in the summer of 2009 (DiSalvo et al., 2009) and ran through the summer of 2011.

**Schedule and Pay.** During the summer, the testers worked from 10 a.m. to 5 p.m., Monday through Friday, for 8 weeks. During the school year, testers worked from 9 a.m. to 5 p.m. on most Saturdays. We paid the testers an hourly rate of $8. A typical summer day consisted of testing from 10 a.m. to noon, lunch, a CS workshop after lunch, and then more testing until 5 p.m. The weekly activities varied, but the majority of the time was spent on testing or tasks related to testing.

On Monday mornings we frequently held quality assurance training and review. On Fridays there were pizza lunches with computer scientist speakers,
and we held a game tournament late Friday afternoon. There were other activities, such as tours of colleges or game companies, and visitors from the game companies would conduct specific training or help with technical issues. Participants also began spending time together over lunch hours and outside of work playing basketball, teaching one another how to jerk dance, exchanging music, working out, and skating.

Recruitment and Consent. Participants were recruited to become part of the Glitch Game Testers program through an e-mail flyer with a 1-page application sent to local youth leaders, teachers, and community members in predominantly African American communities. From the approximately 200 applications received in the first 2 weeks after the first e-mail was sent, we selected 15–18 students to interview each summer and five to interview for fall of 2009. Selections were made based on the date the application was received, with early responders getting interviewed first. To qualify for an interview, applicants were required to be between 16 and 18 years of age and still in high school.

In all cases, the first 20 applicants who met these criteria were African American males. For the summer of 2009 program, 15 applicants who met the criteria were invited to interview at Georgia Tech. All agreed to interview, and 14 showed up for the interview. After the interview, participants were selected based upon punctuality and passion for and experience with playing video games. In making the final selection, priority was given to those who qualified for free or reduced lunch and were rising juniors. Thirteen were selected to participate. One dropped out just before the program began because of other obligations. In the fall of 2009, only three of five invited applicants agreed to an interview, and all three were invited to participate. For the 2010 summer program, the first 18 applicants were invited to interview. Of these 18 applicants, 15 agreed to be interviewed, 14 attended the interview, and 10 were accepted. In 2011, interviews were conducted with 10 participants by the outreach office at the Georgia Tech College of Computing as they began to take responsibility for the program. This requirement to attend the interview helped us determine which applicants would be able to get to and from Georgia Tech for a full-time job. The motivation and self-assurance they exhibited by applying to the job and attending the interview does suggest that the participants may have been more motivated and self-assured than their peers. This should be taken into consideration when reviewing the findings.

All data for this study were collected between June 1, 2009, and July 30, 2011, with a total of 32 participants. All participants and their parents were informed of the human subject protocol, and assent from minor participants and consent from adults and adult guardians was obtained and annually reviewed and renewed.

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1Jerk or jerk’n is a style of urban street dance that was popular in Atlanta at the time of Glitch.
Participants. From the beginning of the Glitch program in June 2009 to the end of the summer program in June 2011, we had 32 total participants (see Table 1). All of the participants told us in the initial interview that they applied to be in the Glitch program because they wanted a job in game testing. Attrition was due primarily to participants graduating from high school or leaving the program during the school year and returning for the following the summer. Three participants left after their first summer to pursue other interests and did not return, and one participant was asked to leave after a year in the program because of poor attendance.

All participants were surveyed for demographic information, including their race and ethnic identification, age, and eligibility for free or reduced lunch at school. We also conducted a survey about their households and family educational history. Finally, we asked each of the students the name of his school so that we could better understand his options for future CS classes.

Demographics. All participants self-identified as African American males, and two participants also self-identified as Latino. The participants ranged in age from 14 to 18 years, with an average age of 17. Of the 32 participants, 24 qualified for free or reduced lunch.

Family. Of the 25 participants who answered questions about their families, seven lived in households with both a mother and a father present, 15 lived with

<table>
<thead>
<tr>
<th>Phase</th>
<th>Name</th>
<th>Description</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Glitch Game Testers:</td>
<td>Eight-week, full-time summer game-testing job program. High school students test prerelease games for clients and attend CS workshops.</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Summer 2009</td>
<td></td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Glitch: School 2009–</td>
<td>Continuing QA testing and CS workshops on Saturdays</td>
<td>9 returning 3 new</td>
</tr>
<tr>
<td></td>
<td>2010</td>
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<td></td>
</tr>
<tr>
<td>III</td>
<td>Glitch: Summer 2010</td>
<td>Second summer, QA testing, CS workshops and new APCS class offered</td>
<td>13 returning 10 new</td>
</tr>
<tr>
<td>IV</td>
<td>Glitch: School 2010–</td>
<td>Continuing with students most Saturdays and APCS classes</td>
<td>14 returning</td>
</tr>
<tr>
<td></td>
<td>2011</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V</td>
<td>Glitch: Summer 2011</td>
<td>Third summer, QA testing, new CS workshops based on game design and APCS class</td>
<td>7 returning 7 new</td>
</tr>
</tbody>
</table>

Note. There were 32 unique participants in Glitch. CS = computer science; QA = quality assurance; APCS = Advanced Placement CS.
one parent (13 with their mothers and two with their fathers), and three had neither a mother nor a father present. The household conditions for these 25 participants, when contrasted with the conditions for most American children between the ages of 12 and 17, showed a greater percentage of Glitch participants living in single-parent homes or homes with neither parent present (U.S. Census Bureau, 2007). Most participants had family members (including extended family) who had attended some college, with about 65% with a family member who had graduated from college. Two participants had an immediate family member with a PhD, whereas one had no family members who had completed high school.

School interest and performance. All of the participants attended low-performing public schools in the Atlanta area. Their self-reported grade point averages ranged from 1.89 to 4.0, with the majority reporting a B average. We did find that they were not always honest about these self-reported grades, and some students exaggerated their grades and performed lower than what they had self-reported. In our observations over the course of 3 years we found that a few participants presented themselves as enthusiastic students, but most presented themselves as unenthusiastic about school or learning. In contrast to these presentations of self, survey data that measured intent to persist in school indicated that all participants were interested in higher education (DiSalvo et al., 2013). In general, these self-reported grades and presentations of self suggest that most Glitch participants were not the worst students, nor were they the most motivated learners and high achievers. Instead, they represented the vast majority of young African American males. They had the potential to perform well in school, but they also had the potential to be drawn into underperforming in school because of sociocultural issues that frequently result in low educational and vocational performance among young African American males (Cook & Ludwig, 1998; Ferguson, 2000; Lewis, Simon, Uzzell, Horwitz, & Casserly, 2010; Majors & Billson, 1993; Mincy, Lewis, & Han, 2006; Richardson, 2007).

Computing interest. During the initial interview most participants expressed little interest in learning computing, with only four students telling us that they had an interest in computing as a career. We analyzed the course offerings of the high schools the Glitch Game Testers attended in order to understand what educational options were available to them. To perform this analysis, we looked at Georgia’s Computer Science Career Pathway, a four-course sequence that fosters computational agency, the idea that students are cocreators of computational tools rather than simply users of premade tools. Even though students were interested in taking more and more advanced computing, the courses were not available in most of their schools (McKlin, Engelman, DiSalvo, & Bruckman, 2010).
**Location.** Testing occurred in the Glitch Lab on the third floor of the College of Computing Building on the Georgia Institute of Technology campus. This floor of the College of Computing Building was abandoned and was in disrepair when we first started using it. With the help of the College of Computing staff and undergraduate researchers we moved furniture and cleaned and renovated one room, the halls, and the men’s bathroom so that the testers only encountered clean, professional-looking spaces. By the third year most of the floor had been renovated and the space felt more like a professional technology environment.

**Game Testing.** Game testing is a form of software quality assurance work. To ensure that the program was authentic, the first author participated in a week-long quality assurance training at Electric Arts Tiburon and used their protocol and training materials as the basis of an industry-standard game-testing program. In Glitch, testers would receive early versions of games from our clients, then look for instances where the code broke down and did not perform as expected. When an error in the code was found, testers wrote up a bug report using online bug-tracking software. This report included a detailed step-by-step description of how to reproduce the bug. Developers would then look at these reports and respond to them by fixing the bug or asking questions about the bug report.

**Learning CS.** Although breaking open games was one method for increasing an interest in CS, on most days dedicated time was set aside for learning about computers and CS. The reason for including a directed CS component was to increase opportunities for learning. This component was designed into the program because we anticipated that these young men would start to look at games differently and this would possibly seed an interest in learning CS. However, without access to learning CS, it was unlikely that the seed would sprout.

**First-year workshops.** Although a study of the CS curriculum has not been a primary component of this work, there have been reflections and iterative design work on the curriculum for the first-year workshops. In 2009, these workshops were taught by Dr. Kenneth Perry, chair of the Computer Science Department at Morehouse College, and second author Dr. Mark Guzdial, professor in the College of Computing at Georgia Tech. These workshops were based on the media computation approach (Forte & Guzdial, 2004) using Alice, a drag-and-drop programming language (Cooper, Dann, & Pausch, 2000), and Jython. In the second year, African American male undergraduate CS majors from Morehouse College taught the curriculum that was developed. In the third year of the program, in response to participants’ concerns about the authenticity of the curriculum, an African American male graduate student developed and taught an introductory program that used the Greenfoot development environment to begin teaching Java (Kölling et al., 2011).
Advanced Placement CS (APCS) class. During the 2009–2010 school year, the cohort of participants who had completed the first summer asked to be taught a programming language “that real developers use.” Based upon the work of Guzdial and Ericson (2005), African American male undergraduate researchers developed and taught a course to help participants prepare for the APCS test.

Building computers and other activities. During the school year, Glitch met only on Saturdays. Attendance during the school year was not consistent because of conflicts with participants’ school and extracurricular activities. This inconsistency, and the long break during the week, made it difficult to follow a longer term CS programming curriculum. In response, undergraduate researchers developed computer-building activities and 2-day workshops to teach CS and to help prepare participants for work and college.

Building computers incorporated learning computer hardware (participants determined the specifications needed for the computers, found the parts that would meet these specifications, and built the computers from scratch) and authentic work (high-performance computers were required in order to run the games). In addition, one of the computers was the final prize in an ongoing Glitch Points competition for the outstanding tester and CS student.

Competition. Formative work indicated that competition was important to young African American males during game play as well as in their everyday lives (DiSalvo & Bruckman, 2010). Because of this, we designed competitive elements into the Glitch program. During workshops and classes, mentors and teachers used competition and rewards to motivate the participants. The types of rewards and prizes varied. Sometimes participants were awarded candy as a prize, sometimes they were rewarded with intangibles such as being voted “best” presenter, and sometimes they were granted points in the overall Glitch Points competition.

An ongoing tally of the points was posted on a whiteboard in the room, and keeping track of points became an important part of each day. When updates were made to the point board, everyone stopped what they were doing and started bragging, making excuses, or trash talking (making exaggerated and often humorous comments about how poorly others had done) based upon the outcome. The points were added up each week to determine a winner. In the summer, the weekly winner received a video game or a gift certificate. At the end of the summer and the school year, the winner won a computer built by the participants.

Data Collection Tools and Methods
This study was part of a larger research project with the Glitch Game Testers at the Georgia Institute of Technology. The previous section describing Glitch
outlined the basic environment, the participants, and the recruitment and consent protocol, which applies to all of the studies. Observations, individual pre- and post-interviews, and surveys on CS learning were conducted in relation to the larger study of Glitch. Although these methods were not central to this study, brief descriptions of these methods are included because they help to inform the face-saving study. Finally, we describe the methods used in the survey and focus groups, which were specifically designed to address our concerns with face saving in the Glitch environment.

**Observations.** Formal observations were collected over the course of approximately 800 hr. Two researchers made daily observation notes on a two-column form consisting of “observations” and “reflections.” In addition, researchers conducted weekly interviews with two to three of the other research team members who were assigned to manage the day-to-day quality assurance operations and to teach the CS workshops and classes. We found that although these team members did not have time to note observations during the week, the weekly interview provided an opportunity to reflect upon the program and participants in great detail. These interviews were audio-recorded and transcribed. The observation forms and team interviews were then captured as short scenarios that consisted of observed conversations and actions (usually 500 characters or less) that were organized by a team of four researchers who participated in the daily activities of Glitch. The scenarios were assigned on the basis of group consensus to one of four categories: CS, full-time work, experience on a college campus, and work in the game industry. Some scenarios were assigned to multiple categories.

**Interviews.** As part of the larger analysis of Glitch, the researchers conducted interviews with Glitch participants. The interviews were conducted as pre-, near-post-, and distant-post-interviews with participants. Twelve participants from Cohort 1 (Summer 2009) and 13 participants from Cohort 2 (Summer 2010) were interviewed. Pre-interviews were conducted during the first week of the 8-week summer program, and post-interviews were conducted during the last week of the summer program. Also, distant-post-interviews were conducted with participants who returned to the program for a second summer during the last week of their second summer program. At all three points in time (pre, near-post, and distant-post), the participants were asked to describe their interest and experience in computing, their plans for taking more computing courses in high school, examples of computing tasks that they helped others with and on which they sought help, computing tasks they would like to know how to do, their thoughts on working for a gaming company, and their future education and career plans. During the post-interviews, participants were also asked to describe their role within Glitch, whether they felt their work made a difference to the game, and what they were
most proud of during the summer program. The interviews were conducted by the first and third authors, audio-recorded, transcribed, and analyzed by a third person not involved in facilitating the interviews.

**Follow-up.** The lead author maintained a relationship with most of the participants through occasional e-mails and participation on social networking sites. Through these correspondences and direct e-mail appeals, we have data on the post–high school activities of 23 of the 25 participants who graduated from high school. In this article we report persistence: whether the participants have attended a higher education or training program, the type of education program they are involved in, and the subject they study 1 year after graduating from high school.

**Surveys.** Online surveys were used to meet several needs. First, with the assistance of The Findings Group, LLC, we administered two surveys on interest in computing and intent to persist in education and computing. The surveys were used primarily for evaluation and to help us understand the effectiveness of Glitch, and findings were reported in previous publications (DiSalvo et al., 2013). Second, we developed a survey to measure face-saving tactics used by Glitch participants. In this section we explain the face-saving survey.

Every other week between June 1, 2010, and July 23, 2010, participants were asked to complete one of four surveys that asked about hypothetical justifications they might use for (a) participation in CS activities, (b) working on a college campus, (c) game testing, and (d) working full time (N = 23, response rate of 92.39%). The objective of these surveys was to understand what variations might exist in terms of what participants perceived as an appropriate presentation of self in front of different people in their lives.

Participants gave us their perceptions of what 16 people in their lives would think were good or bad justifications for participation in Glitch (see Figure 1). These people were the participant’s mother, father, grandmother, grandfather, favorite aunt, favorite uncle, sister(s), brother(s), best male friend, best female friend, other friends, popular kids at school, geeky friend, coworker, favorite teacher, and coach or activity leader. The average appropriateness of the justification was rated on a semantic differential scale, with 1 being perceived as a good reason and 5 being perceived as a bad reason, with an option that the question did not apply (i.e., this person was not present in the participant’s life).

These surveys were developed from similar hypothetical survey and interview tools used to measure face saving (Bond & Lee, 1981; Juvonen, 2000). For example, the participants were asked how different individuals in their lives would respond to justifications for putting extra time in on their CS projects. The justifications were based upon similar instruments and studies that observed student

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**2**The Findings Group, LLC, was the independent firm hired with funds from the National Science Foundation to evaluate the work done in Glitch.
When people ask you, "Why are you working so hard on your Glitch computer science project?" You tell them, "Because, I want to get extra points for the weekly competition." What would the following people think of that answer:

<table>
<thead>
<tr>
<th>Good Reason</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>Doesn't apply to me 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Your mother</td>
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<td>Your father</td>
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<td>Your grandmother</td>
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<td>Your grandfather</td>
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<tr>
<td>Your favorite aunt</td>
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<tr>
<td>Your favorite uncle</td>
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<td>Your sister</td>
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<td>Your brother</td>
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<td>Your best male friend</td>
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<tr>
<td>Your best female friend</td>
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<tr>
<td>Other friends</td>
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<tr>
<td>Popular kids at school</td>
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<tr>
<td>A &quot;geeky&quot; friend</td>
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<tr>
<td>A co-worker</td>
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<tr>
<td>A favorite teacher</td>
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<tr>
<td>A coach or activity leader</td>
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</tbody>
</table>

**FIGURE 1** Sample question from face-saving survey. The face-saving surveys asked participants to rate how 16 people in their lives would respond to hypothetical justifications for different aspects of Glitch.

justifications (Juvonen, 2000; Urdan et al., 1998; Wilson & Shrock, 2001) and upon justifications we had observed in Glitch. However, our survey’s design failed to capture an important aspect of self-presentation: avoidance of certain topics. In addition, the surveys were not designed well for rigorous statistical analysis. For example, determining statically significant differences in responses can only be meaningful if a baseline or norm for justifications can be established. Refining survey instruments is an opportunity for future work. With these limitations noted, we have included the surveys in the article because they were important in seeding the focus groups and they were an indication of which responses clustered together.

**Face-Saving Focus Groups.** For each face-saving survey, four different participants were selected to be part of a focus group. The groups were selected to
balance new and returning participants: Each group consisted of two participants who had a year of seniority in the program and two participants who started in June 2010. Beyond this condition, groups were randomly selected and assigned to a focus group without regard to the topic. None of the Glitch participants took part in more than one focus group. The first focus group took place 2 weeks into the 8-week program, so all participants had at least 2 weeks of experience in the program.

The first author led these focus groups. Because she had a daily working relationship with the participants and frequently mentored them regarding work, school, and future plans, the participants were comfortable in discussions. The focus groups began with instructions for the participants to be honest because there would be no repercussions for what they said in the focus groups and because their honest answers would make for better research and better programs like Glitch in the future. The candor participants showed during the focus groups indicates that they took these instructions to heart. However, the lead author was seen as a manager and mentor in the program, and this may have biased responses if participants felt their answers would risk their employment.

Focus groups met 1–3 hr after participants completed the survey. The focus group leader used the surveys as a guide for the focus groups, reviewing the questions, asking why one response would be more acceptable than another, and asking for more open-ended responses. Because of this, the four focus groups tended to focus on the topics of the surveys: participation in CS activities, working on a college campus, game testing, and working full time.

Focus groups were audio-recorded and took between 29 and 41 min. The focus group leader then transcribed the audio recordings, imported the transcribed documents into a qualitative analysis software program, and coded for recurring themes with another researcher. The second coder knew the participants well and had been conducting field observations with the program for 1 year.

The coding took place in five steps:

1. The two researchers independently reviewed all of the transcripts and conducted the initial coding process (Bailey, 2007), identifying patterns and themes that were anticipated and emergent.
2. The researchers compared independently derived codes, discussed each code, and agreed upon a final set of themes and patterns for the codebook (see Table 2).
3. Both researchers conducted focused coding (Bailey, 2007), reviewing the transcripts again and assigning codes using the agreed-upon codebook.
4. Researchers reviewed each code of the transcript together. When disagreements in coding occurred, they reviewed the text, discussed the coding, and agreed upon the most appropriate codes.
<table>
<thead>
<tr>
<th>Coding Category</th>
<th>Justification Description</th>
<th>Paraphrased Examples to Help Contextualize Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gaining experience</td>
<td>Participants express that they are gaining some type of experience in Glitch as a justification for their participation.</td>
<td>“Yeah, I tell my gran that I am getting experience here.”</td>
</tr>
<tr>
<td>Day-to-day work experience</td>
<td>Getting real work experience is valuable.</td>
<td>“You have to learn how to deal with your manager and take the bus.”</td>
</tr>
<tr>
<td>Growing up/becoming a man</td>
<td>Working full time is giving them experience with adult responsibility.</td>
<td>“My friends want me to hang out, but I tell them this is what you got to do when you really work.”</td>
</tr>
<tr>
<td>Learning computer science</td>
<td>Learning computer science is important for one’s future.</td>
<td>“We should have a leg up in programming classes when we go to college.”</td>
</tr>
<tr>
<td>Life at college</td>
<td>Working on a college campus gives experience with college life.</td>
<td>“I know how to act when I go to college next year.”</td>
</tr>
<tr>
<td>Competition</td>
<td>Participants express that a desire to win justifies parts of their effort with Glitch activities.</td>
<td>“I am doing it because I want to win.”</td>
</tr>
<tr>
<td>Winning prizes</td>
<td>The prize or reward is a reason they give for their actions.</td>
<td>“I would tell them that I want to get the computer at the end of the year.”</td>
</tr>
<tr>
<td>Being the best</td>
<td>Being competitive and trying to be the best is valued in itself.</td>
<td>“My dad would respect it if I told him I just want to win to prove I am the best.”</td>
</tr>
<tr>
<td>Authentic contributions or work</td>
<td>Participants express that their contribution to or participation in authentic work justifies their participation in Glitch.</td>
<td>“I am doing real work here and people think that is cool.”</td>
</tr>
<tr>
<td>Earning money</td>
<td>Getting paid for a real job is valued.</td>
<td>“I am the only one of my friends who have a real job.”</td>
</tr>
<tr>
<td>Video games</td>
<td>Contributing to “real” video games is valued.</td>
<td>“I show my friend the games I helped make better.”</td>
</tr>
<tr>
<td>Work is valued</td>
<td>Living up to the responsibilities of a job is valued.</td>
<td>“My parents see that I have real responsibilities now I go to work every day.”</td>
</tr>
<tr>
<td>Personal interest</td>
<td>Participants express that the ties between Glitch and their personal interests, such as games or animation, is a justification for their involvement.</td>
<td>“I tell them that I know way more games now.”</td>
</tr>
<tr>
<td>Misleading and bragging</td>
<td>Participants make their participation in Glitch sound impressive through teasing or bragging.</td>
<td>“I just lay it out there that I work on video games.”</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>Working on “real” games</td>
<td>Their contribution to the development of games is overemphasized.</td>
<td>“I tell people, yeah, we did work with EA Sports.”</td>
</tr>
<tr>
<td>Being “paid to play”</td>
<td>They brag about being paid to play without letting people know how boring or difficult the job is.</td>
<td>“I was paid to play.”</td>
</tr>
<tr>
<td>Working at Georgia Tech</td>
<td>They tease people with the mystery and importance of what they do at Georgia Tech.</td>
<td>“I let them know I work at Tech, then I tell them I work on video games.”</td>
</tr>
<tr>
<td>Blasé or negative to appear more mature</td>
<td>They brag about how difficult it is to work full time or other aspects of the job, sometimes then bragging about how they stick it out.</td>
<td>“I told my friends they wouldn’t understand because they don’t work.”</td>
</tr>
<tr>
<td>Conversations to avoid</td>
<td>Participants express that they actively avoid conversations because it is not likely to impress, would lead to unwanted conversations, or would give people the wrong impression.</td>
<td>“I only talk to my best friend about learning to program. No one else would care.”</td>
</tr>
</tbody>
</table>
5. In an independent pass, one researcher coded statements as “Adult,” “Peer,” or both “Adult” and “Peer” depending on the intended audience of the justification. This code added a dimension to the coding, allowing for queries based upon the type of person and the justification.

The use of focus groups had both advantages and disadvantages. For example, individuals’ answers may have been constructed to fit group consensus, and therefore unique perspectives may not have been expressed. However, group consensus may have been more reflective of face-saving tactics because face-saving tactics are based upon the expectations of social groups. To mediate the weakness of group consensus, we conducted multiple sessions with different participants in each session to eliminate the anomalies of one particular session or group.

**FINDINGS**

The surveys and interviews on interest in computing, confidence with computing, and intent to persist with computing education or careers have been organized by immediate, short-term, and long-term impact. This organization provides a linear perspective on the connection that participants made with computing through Glitch. Through these findings, we can see demonstrations of Glitch’s success in motivating this group of young African American males to study CS. This conflicts with observations that these young men actively projected a cool pose and lacked concern for learning computing. Based upon this conflict and other observations we conducted surveys and focus groups to systematically study face saving as a tactic for navigating motivations to not learn. Data from interviews and observations are contrasted with these findings to help illuminate issues of face saving in Glitch.

**Immediate Impact: Interest and Confidence in Computing**

Increased interest and confidence in computing was demonstrated in pre- and postsurveys and in interviews. In the pre/postsurveys reported in DiSalvo et al. (2013), there were statistically significant gains with small to medium effect sizes in participants’ interest in computer programming ($p = .008$), in their interest in information technology ($p = .013$), and in their interest in computer engineering ($p = .013$). There were similar results in student confidence. Most participants indicated that they knew about the same as or a little more than the other students. In particular, participants demonstrated increased confidence on “I know how to use the computer” ($p = .005$) and on the negatively worded “I get a sinking feeling when I think of trying to use a computer” ($p = .046$).
In interviews, participants told us about their increased interest in computing. Levon, who told us he performs very poorly in school generally, said, “I am highly interested in computing. Actually, I’m so interested that when I take my classes, it’s more of an only option thing for me, because I don’t really study anything else that much.” After his first summer in Glitch, Steve told us he was more interested in computing: “I would like to know how to be better at programming. This summer I’ve learned a little about programming. It’s interesting, I would like to learn more about that.” After Steve’s second summer, and after he took the APCS prep class, he knew that he wanted to be a CS major, and the way he talked about digital games began to reflect the fact that he had moved from being a consumer to a producer of technology. Steve told us,

Like, for example, if you have a cake, you don’t think about how the cake is made unless you’re a chef or something. I am starting to do that with video games. Like, now I see what it takes to make the video game instead of just the video game as a whole.

Short-Term Impact: High School CS Course-Taking Plans

In evaluating the short-term impact Glitch had on interest in, confidence with, and intent to persist with computing, we looked at the students’ plans for taking CS classes in high school and their test-taking patterns with the APCS test. Both of these measures provide perspective on the barriers to lower income young African American males pursuing computing.

High School CS Classes. Overwhelmingly participants planned to graduate high school. Previously reported survey data suggested that the Glitch program had a significant effect on participants’ intentions to take computing classes “next semester” (\( p = .01 \)) and “as many classes as possible in computing every semester” until they graduated (\( p = .19 \); DiSalvo et al., 2013).

APCS. Of the students who participated in the APCS prep course during the summer of 2010, only one pursued the course and took the test in May 2011. He did not receive a qualifying grade on the test for college credit.

Originally 14 participants took the summer course, but only six participants were present during the entire summer course and the school year portion in which they continued to review material (the other eight participants had graduated or left the program for the school year). During the summer, the participants were able to cover a great deal of material, but during the school year, with once-a-week

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3Names of participants have been changed to protect their privacy.

4The eight participants who had graduated in May 2010 told us they wanted to be part of the APCS prep because it would prepare them for their introductory CS classes in college.
classes and some large breaks or missed classes, participants had a hard time keeping up. In the spring semester, the undergraduate instructors felt that only four of the six participants were prepared enough to take the test and felt confident that only two would get a passing grade. As reported previously, only one chose to take the test.

We asked the five who decided not to take the test why they chose not to, and several reasons were given. One student was taking the AP Calculus exam that week as well and told us he wanted to concentrate on that rather than the APCS test. Three told us they did not feel prepared to take the test, although one of these participants, from our instructors’ perspective, was likely to pass the test. All participants (except one who attended the test site school) also told us that logistics was part of the reason: The test was offered at 8 a.m. at a different school than that which they attended, on a school day, and none of them wanted to wake up that early, take public transportation, and miss a morning at their school.

These were all reasonable and compelling reasons not to take the test that we tried to mitigate. First, the Glitch program covered the cost of taking the test. Second, we offered to drive to the participants’ homes, pick them up, and drive them to the test site. Third, we offered to write an explanatory note to their schools. Fourth, we emphasized that no one had expectations for their test results except to understand what they had learned from the prep course. These offers did not change anyone’s desire to take the test. The barriers to taking additional CS courses in high school and taking the APCS exam hampered the participants’ ability to follow through with short-term impacts from Glitch. Inside of the Glitch program participants were eager to learn, but pushing that interest outside of the boundaries of Glitch proved to be more difficult.

Long-Term Impact: Intent to Persist in Higher Education and CS

Although participants were not able to pursue CS interest in their high schools, surveys and interviews suggested that they intended to pursue CS in their future careers (DiSalvo et al., 2013). Participants reported significant differences in their pre- and post-intentions to graduate from college with a computing-related degree ($p = .026$) and in their intentions to attend graduate school in a computing-related field ($p = .028$).

Changes in intention to pursue computing were also reflected in the post-interviews. Some of these changes were quite dramatic, such as Reggie’s new career goals:

I wanted to get into criminal justice but now I am starting to like programming so I think I am going to get into programming . . . it is just interesting. There is always something to learn, always something new you have to do. It would never get boring. It isn’t like you do the same thing over and over.
Others were subtler, such as Franco, who in the pre-interview talked about becoming a pilot as his career goal. He now saw the opportunity to combine CS with his love of aeronautics. Franco told us, “I will probably go into computer science and use it in [the] aeronautics field.” Some students expressed an interest in computing because they wanted to make games:

> My interest in computing involves me designing, really, I just want to know everything. Like, I want to be able to do everything. I want to create [three-dimensional] models, create environments, and know how to do all the programming, and do the visual components. And my goal is to create video games. (Dre)

The survey data and interviews are evidence that these young men intend to pursue computing for their careers.

**Long-Term Impact: Postsecondary Educational Choices**

The Glitch Game Testers closed its doors in August 2011. As of that point, 25 participants out of 32 had graduated, and the remaining participants were still enrolled in high schools. We were able get updates from 23 graduates in the fall of 2012 and from 17 of these young men in the fall of 2013. A total of 21 pursued postsecondary education and two chose to enter the workforce.

The five students pursuing non-CS-related education generally came from families with a stronger history of educational attainment. These five students were all attending in-state public schools and majoring in education, marine biology, business, and film. As of 2013 we have only maintained contact with two of these participants. Both are still in school.

The 16 students who pursued additional computing education were taking several different paths to pursue careers as computer scientists, game developers, Web developers, and software engineers. Only three of these students had indicated that computing was a possible major before the Glitch program started. As of 1 year after graduation, 11 were continuing on in 4-year schools and majoring in CS. Most of these students were attending in-state public schools, but one was attending a private historically Black college, and one transferred to a military academy after his first year. Three students started in 2-year institutes studying computer information technology, but one dropped out at the end of the year and enlisted in the military with hopes of pursuing technology training. Finally, two students were pursuing arts degrees with digital media as their focus, one in a 4-year college and one in a 2-year institute.

Of these participants we have maintained contact with 13 as of the fall of 2013. Eight students are on track to graduate with 4-year degrees in CS. One participant graduated with an associate’s degree in information technology and now works in tech support. One is still in the military. We know that at least two participants...
who were CS majors have dropped out of college and are currently exploring new schools. One participant in a digital arts program died in 2012.

We maintained contact with both participants who did not attend college. One is working in food services and started a clothing company with two other Glitch participants he met in the program. The other participant started Glitch with an interest in pursuing computing education. He looked for employment unsuccessfully for more than a year. He then enlisted in a branch of the military with hopes of pursuing technology training.

Across all of the data it is clear that most participants now intend to persist in computing. However, there are still real barriers to their success outside of the Glitch environment that these young men may not be equipped to handle. After entering college, some of the participants have not made good grades as easily as they thought they would with their prior experience. One participant did not attend school at first because of finances, then went to a technical school, then dropped out to enter the military. Finally, some participants chose to go to 2-year for-profit institutions that were easy to get into and finance. However, some of these schools underperform in helping place students in jobs or 4-year colleges, and they also frequently overcharge. This may leave students with high debt and few career opportunities (Lansing & Olsen, 2011).

Barriers such as these that many young lower income African American males face will likely temper the remarkable number who chose to pursue computing in the future. For example, one barrier that Glitch participants did not face in the program is the feeling of otherness that underrepresented groups experience frequently in computing. This will be an additional challenge as these young men move forward in computing careers. Six of the 16 CS majors are attending schools in which other Glitch guys (either students or mentors) are CS students, and two of them are roommates. We have observed on social networking sites that they will occasionally post computing questions or problems and tag their Glitch friends (including us) to help them find answers. Hopefully, the network of African American male CS majors established through Glitch can continue and grow in these ways to help mitigate a feeling of otherness.

Face Saving

Our observations of everyday interactions supported the conclusion that many of the participants are on track to pursue computing as a career. We observed that the Glitch guys had become friends. They spent time together during the workday and after, trading music and games and working on side projects. We observed that they liked and respected one another. They occasionally talked about programming, hacking, or game design without seeming to worry too much about being thought of as geeks. However, they did not start out that way. When they started in Glitch they presented very different faces to their peers. In our first CS
workshops, they kicked back in their chairs and only answered questions when candy or points were offered as a reward. These external motivators seemed to be the only thing moving them to learn or to demonstrate learning.

We questioned why these external motivators worked. It seemed that the Glitch guys’ willingness to participate in learning was not motivated by pieces of candy; the candy was only an excuse for trying hard. We felt that they had a desire to learn, but they could not act upon it because it was in direct contrast with their presentation of self. When they could protect their presentation of self, or save face, by using the candy or competition as an excuse, they eagerly participated. As they spent more time in Glitch, some of the face saving fell away.

These initial observations prompted us to conduct a study of face-saving tactics in regard to participation in Glitch. Although face saving was not the only factor in how the participants represented Glitch, or the only method for navigating conflicting motivations, we did have a number of indicators that it was an important factor in both. This analysis of the findings includes data from surveys and focus groups designed to elicit responses concerning the way in which face saving was used to justify participation in Glitch. Also included are findings from interviews and observations that help illuminate or support these findings. These are organized by the four themes of the surveys and focus groups:

- Participating in CS
- Participating in higher education
- Participating in the game industry
- Participating in full-time work

The four focus groups that were held every 2 weeks during the summer of 2012 began by reviewing a face-saving survey that was administered earlier in the day. In this way the surveys directed the four participants to think about the theme in context of Glitch while eliciting open-ended responses. Although each focus group was made up of newer participants and participants in their second summer with Glitch, we noted no differences in participants’ responses on the surveys or in the focus groups. This suggests that there was little change in their presentation of self over the course of participation, or enculturation in the Glitch environment happened very rapidly. In this section the findings of participants’ face-saving tactics are contrasted with findings from interviews and observations.

**Face Saving and Participating in CS.** In one of the four surveys, participants were asked to rate what people would think about three different answers to the hypothetical question “Why are you working so hard on your Glitch computer science project?” Participants rated three options, “I want to learn about technology,” “I want mine to be the best,” and “I want to get extra points for the weekly competition,” on a 5-point scale, with 1 as good reason and 5 as bad reason (see Figure 2).
In the survey, participants rated learning about technology as a good response for why they were doing CS work. In contrast, in the focus groups, participants responded that they would tell few people they were learning about CS. When asked how he would tell his friends about putting in extra time for his CS project, Anthony said, "They wouldn’t care about either one: the learning aspect and they wouldn’t care about the points. I mean they are not in it, so why would they care?"

During the focus group we learned that the participants had not told their parents they were learning CS or taking a class to prepare them for the APCS exam. When asked why they did not talk with their family about CS, the participants indicated that it would open up unwanted conversations. Daniel said, “I have a talkative family. And, um, sometimes I really just don’t want to deal with it and I just tell them, ‘It pays.’” Anthony supported that idea: “Yeah, my family doesn’t know what CS is. I would have to explain it to them.” And Kadeem added, “No, they’d want me to explain it to them.” Arnold provided us with another explanation in a post-interview: that it might complicate his relationship if he knew more than his father, “It’s like so crazy because I’m like, ‘Wow. Like he’s really technology-illiterate.’ So, maybe I can teach him a few things, but not too much because I don’t want to get in trouble.”

The participants indicated that they would be able to talk about their interest in computing with their closest friends, teachers, “geeky” friends, and coworkers. Steven told us he would only tell a close friend that he was putting in extra time “because I am interested in the field and it deals with some of my hobbies, too.” To
a “geeky” friend or teacher, participants were likely to say that they have a strong interest in technology and were taking a “special” computer course. Dre told us his response to a computer teacher would be, “Oh, I went to work, I also got paid and learned some APCS.” Frequently the participants complained about the tediousness of game testing and joked that this made CS classes appealing. As a result, participants might say to their coworkers that they were putting in extra time on their computer programming projects to avoid spending time testing.

Contrasting face saving with interest in computing. Although participants chose not to talk about CS learning among friends and family, participants told us in interviews that learning about CS was important to them and was an important factor in their future. When asked about their interest in computers, most of the participants responded with enthusiastic responses about what else they would like to learn or how important computing was to them. For example, Daniel said,

I want to take computing to the highest point, I guess. Go into research and development things. That’s where the money is, I guess. [Laughter] Coming up with new ideas of how certain things could work. Then implementing them and trying to make code that does things that haven’t been done before.

When asked a more general question, “What accomplishment are you most proud of from the summer?” participants frequently talked about CS learning. Michael said,

I learned how to use Net Beans and Java. At first, I didn’t know it was a real program until they showed us Net Beans, so I was kind of psyched about that. Then, when we used it I learned how to make methods and classes. I really got into it. I’m still trying to learn more about it.

Arnold, who was afraid to talk to his dad about CS, told us he was most proud of what he learned in general about computers: “I learned a lot about computers. Like my knowledge is so . . . compared to my knowledge before, I’m really on top of a mountain right now looking down.”

In our daily observations, we also saw enthusiasm for learning computing, and participants frequently asked for help with debugging programming problems or understanding a new concept. We also observed that when one of the participants started asking questions, particularly a participant who was more senior and respected by his peers, all of the participants felt more at ease to geek out by asking questions and tinkering with the program. This open enthusiasm for engagement in CS learning seemed to increase as the program progressed. In future studies
we would seek to understand face-saving tactics across time to measure how they change as participants become more engaged in learning.

**Face Saving and Participating in Higher Education.** In the survey, participants rated the way in which people in their lives would respond to four hypothetical responses regarding their college campus experience. The hypothetical question was “What is good about working on the Georgia Tech campus?” Two reasons were rated as good (between 1 and 2) excuses for most audiences: (a) “I like getting experience/getting comfortable on a college campus” and (b) “The students who work with us tell us about classes, homework, campus, etc.” Participants felt that popular kids would be less accepting of this reason (see Figure 3).

The survey also asked how participants expected people would respond to “Nothing, it is just a job.” Most participants indicated that adults would think this was a less acceptable excuse (average ratings between 3.5 and 4). A similar pattern was found with the reason “I like meeting the ladies.” During the course of the program, “meeting the ladies” was a somewhat tongue-in-cheek reason participants gave for eating lunch outside or asking to run errands on campus. Good-natured bragging and talk about meeting young women was a constant source of banter in Glitch. Occasionally we had to close the door to the game-testing area because female high school students were attending camps and participants became distracted. Because of these tendencies, “meeting the ladies” was included as an item

![Figure 3](image-url)  
**Figure 3**  
Face-saving survey responses to higher education justifications. This figure illustrates average participant ratings of justifications for participation in computer science activities on a scale of 1 to 5, with 1 (gray) as a good justification and 5 (white) as a bad justification.
in the survey. In focus groups, participants’ conversation supported the survey findings that adults and female peers would think this was a poor justification and male peers would think more highly of this justification. Arnold explained why talking about the women on campus was of special interest to their male peers:

Oh I might say it to a homeboy. Because they’re used to one type of high school girl, but there are girls from all over the country, all over the world at college. In a way it might influence them to want to go to college, so they could meet new people other than those they’ve been around their whole life.

Adults were less likely to be given dismissive or playful excuses. As Rodrick mentioned, “To the kid at school I would say it’s fun, better than what you’re doing. I would say it is a good experience to my gran.” In the focus groups, when asked how they would explain why they liked working on campus, participants indicated that learning life skills was highly acceptable to most adults.

Participants also told peers how being on a college campus was different than high school and provided them with life skills that they did not get in high school. Rodrick said,

I say it’s not high school . . . You have to be more responsible. You have to buy your own food, get your own transportation, buy your own supplies, and get your own place. It ain’t like your parent or grandmother going to help with all that.

An unanticipated finding was that the association with Georgia Tech held significant social status with adults and peers. In the following short interaction, the participants explain why Georgia Tech is an important part of the program to mention:

Jayden: I would say I work on Georgia Tech campus. Testing video games and clients bring us video games.
Interviewer: Why would you mention Georgia Tech?
Rodrick: ’Cause it grabs their attention fast ’cause it is a college campus.
Arnold: It’s not even that. It is just that the name Georgia Tech is well known as one of the best engineering school in the country. And that is an achievement to actually be in the presence of that setting.

Similar to bragging about being part of Georgia Tech, in interviews participants reflected on the positive influence of being on a college campus: “I got to see more of a college atmosphere, and talk to people in college, and find out more just about schools in general, and more about what I wanted to do in the future” (Isaiah).

Contrasting face saving with interest in higher education. Although participants did mention gaining experience on the college campus in our interviews,
they were more likely to talk about how much they valued specific people they encountered rather than being on a college campus or associated with Georgia Tech. For example, when asked what he remembered about other activities besides game testing, Terell mentioned that he was surprised that a visiting faculty member<sup>5</sup> was funny: “The guest speakers, one of them, I think he was the Dean of Tech or something like that. He’s very smart, and he was just teaching us things. He was funny, too.” We observed that the undergraduate researchers who taught the CS workshops also had a strong influence and were mentioned frequently in interviews:

The undergrads who teach us say we’re learning what they are supposed to learn in college right now, classes that they actually took. So, I might have a little advantage, even though Corey and Markus,<sup>6</sup> they teach a different way than the professors might teach. (Levon)

**Face Saving and Participating in the Game Industry.** In the survey, participants rated how people in their lives would respond to two hypothetical responses regarding why they were in a game-testing program. The survey asked the hypothetical question “Why are you a Glitch Game Tester?” The hypothetical responses “I love games” and “I want to learn how to make games” both rated as good reasons for most audiences (average ratings between 1.38 and 2.1). Geeky friends and coworkers were perceived as finding these reasons more acceptable than other groups. In contrast, the popular kids were perceived as finding both reasons less acceptable than other groups: 2.48 for “I love games” and 2.2 for “I want to learn about making games.” (see Figure 4).

In focus groups, participants told us they also used games as a way to brag about their involvement in Glitch to their peers. They emphasized that games were cool, that they were “paid to play,” and that they were making authentic contributions to real games. In one exchange, the participants enthusiastically talked about how they could brag about their job:

Interviewer: Let’s say you’re going back to school this fall, while talking to your friends someone asks you what was it like working full time this summer, what would you tell them?

Dre: The first thing that I would say is yeah I just play games for money. I would just try to tease them. First I probably ask them “What you do this summer?” Then they ask me what I did. And I just say

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<sup>5</sup>Charles Isbell, College of Computing associate dean for academic affairs, is an African American male who positioned himself as having a similar background as the participants.

<sup>6</sup>Corey Stewart and Markus Austin are former Georgia Tech CS majors who helped manage and teach CS workshops in Glitch. Both are African American males who chose to work with Glitch as a way to “give back” to the African American community.
back in his chair], “Ohh, I didn’t do too much I just played games for money, nothing new, same old same old.”

Terell: And they be like, “Oh, that’s cool. What games did you play?”

Dre: And you’re like, “Ahhh... details, details we don’t want to get into that.” [Everyone laughs]

Interviewer: Do you all do that, put that teaser out there?

Dre: Oh yeah, “We play games for money.”

Xavier: You know last year, we did that Cartoon Network game. I’ll be like, “You’ve seen that commercial, I helped on that.”

Contrasting face saving with feelings about game testing. In contrast to these ways they presented game testing, participants spoke in interviews about how tedious and difficult the work was. As Xavier told us,

I thought it would be fun, to have a good time, testing good games, not just messing around. Now that I’m doing it, it’s very repetitive, and it takes a long time, and then you have to write up a glitch the right way, you can’t just make a shortcut to it.

Participants also expressed pride in their game-testing work during interviews that they did not seem to be telling their family and friends about. As Isaiah told us,

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Participants often complained about the games they tested because they did not in general consider them fun or cool.
Every game has stuff that when you’re playing it just makes you real mad. Some stuff just pisses you off to the point of you just don’t want to play that game anymore. I feel like I found a few of those [bugs]. So, I feel like that will keep somebody from quitting the game for forever.

**Face Saving and Full-Time Work.** In a survey, we asked participants to rate what people would think about four different answers to the hypothetical question “What is it like working full time this summer?” Participants perceived that for adults and siblings the justifications “Now I know what it is like to be a man and work full time” and “I am learning about how to act at work” were acceptable (averages between 1 and 2). Participants perceived that nonfamily peers would rate these excuses between 1.94 and 2.5, slightly better than “It makes me see why I don’t want to do a lame job when I grow up,” which were rated between 2.94 and 3.11. Participants perceived that adults would rate this answer even lower, from 3.27 to 3.63. The answer “It sucks” was rated poorly for all people (averages between 3.84 and 4.65; see Figure 5).

In focus groups, the participants were asked what response they would give to parents about their experience working full time. Many expressed that working full time was difficult and game testing was tedious, but they would be unlikely to tell their parents or guardians a negative-sounding response. They were more likely to emphasize the responsibility of working full time to their adult family members. As Steve told us, working full time is tied to manhood and growing up

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**FIGURE 5** Face-saving survey responses to full-time work justification. This figure illustrates the average participant ratings of justifications for game industry work on a scale of 1 to 5, with 1 (gray) as a good justification and 5 (white) as a bad justification.
for his family: “They told me when I first got the job, ‘Yeah, Steve is being a man now, he is making his own money.’” Levon said that talking about a job makes him seem more grown up: “My folks look at me as more of an asset. Yeah, to have a job, and they are like [in deeper voice], ‘Oh, responsibility.’ They look at you as more mature. You got more responsibility.”

For peers and adults other than their parents, participants sometimes presented the difficulties of Glitch as a way to appear grown up and to bond over the difficulties of life. So although it did not rate highly in the survey, participants talked in the focus groups about using the justification “It sucks,” as well as emphasizing negative aspects or difficulties of the job, in order to make themselves appear world-weary and mature. When asked what he told people at school, Eddie said that he made sure people knew that the job was difficult:

I tell everybody, you sit there and play the same game for 8 hours straight sometimes. It is not that fun. [Shaking head, laughing, and emphasizing] It is not that fun. But then I tell them there are days we get a new game and we play ‘em. But other than that it’s a real job and it’s not fun.

Xavier said,

I would say, “You know it was boring, but you know at the end of the day I deal with it” . . . Or I’d say, “It wasn’t easy. It was very tiring. I had to go see the chiropractor a couple of times.” [Laughing]

Participants also indicated that to some adults and peers the idea of working full time and being paid good wages was of significant social value. Keandre told us, “I just probably tell them the same thing I tell a friend. ‘Yeah, it is a job.’”

When asked what other responses they would give to less close peers, the participants emphasized that they had fun and got to hang out with people their age who became friends. Jayden told us that he would mention to peers at school “I had a good experience with friends,” and Levon mentioned that he would add a chance to brag about getting paid: “I would say that I like it, which I do, and that I have fun and then I might just push it in there, oh it also pays good and it has good hours.”

Contrasting face saving with feelings about work. Although the face that they put on working full time was frequently about the weight of the responsibility and simply being more “grown up,” in interviews the participants told us a different story about working full time. For all of the participants, this was their first full-time job, and for many it was the first time they were responsible for getting themselves to and from an activity. In many ways, the logistics of waking up on
time, getting to work, managing their own lunch, and budgeting for all of these things were the experiences they most valued. As Arnold mentioned, “It is just the experience. Like you learn a lot of things. I didn’t know how to ride the bus, so I had to learn. It is just things like that that you can’t survive without learning.” And Isaiah told us about how financial independence changed his relationship with his mother:

I make money. I don’t have to rely on anybody else for what I want or need. So, I don’t have to hear my mom give me a lecture about why I shouldn’t get this or why she’s not paying for it.

DISCUSSION

Although the participants in Glitch did learn computing, they also exhibited motivation to not learn. First, within the context of Glitch, we observed that the participants maintained a cool pose when CS workshops began. Second, even when we saw evidence that participants were motivated to learn computing, they still hid their interest in learning from friends and family, indicating conflicting motivations.

From the findings, patterns in participants’ face-saving tactics emerged. We identified four clusters of people who were perceived as accepting of similar faces of the Glitch program: (a) caretakers made up of adult family members, (b) peers who were not close to the participants, (c) close friends and people with an interest in computing, and (d) male peers.

Caretakers

In many cases, participants lived in extended family homes, with grandmothers, grandfathers, aunts, and sisters taking on significant caretaker roles in addition to or in place of mothers and fathers. In focus groups, their presentation of self to these caretakers was centered on gaining experience that their caretakers would see as valuable to the participants’ future while hiding or avoiding talking about other aspects of the program.

Participants wanted their caretakers to respect them for gaining real-world work experience and being responsible, “acting like a man.” They also emphasized the value of being on a college campus and learning how a campus works. Participants perceived that Georgia Tech was a valued association because it held prestige for their families, and they were associated with that prestige because they worked on campus. Indeed, working at Georgia Tech was the only justification that participants felt would impress all groups.

Not all aspects of Glitch were positive for the participants. Participants found it difficult to test games all day, miss out on summer fun, and wake up early
They talked about these aspects of Glitch to some people, but to caretakers they only presented the positive experiences gained in Glitch, perhaps to prove they were living up to the responsibility.

Gaining experience with computing was something they avoided talking about with these caretakers. Indeed, participants repeatedly told us that they tried not to talk about the CS aspect of the program with their family. Most suggested that it was because their families would ask too many questions, but more subtle fears of knowing more than one’s parents or having parents look foolish were also put forth as reasons for avoiding these conversations. This suggests that participants did not want to complicate their relationships by demonstrating how much more they knew about computing than their caretakers.

Design of learning environments that consider how the experience will be presented to caretakers may be important for many young audiences. These findings suggest that for an audience of young African American males, design elements that include work or adult responsibilities would be the most valuable aspects of the program to their caretakers. By including these elements participants could position the learning experience to these important adults in their lives in a way that would not threaten the face of the participants or their caretakers.

Less Close Peers

Participants tended to talk about the popular kids at school and other friends similarly, bragging to these peers more than any other group. In many cases the participants considered themselves part of the popular group, so these groups were one and the same. They also withheld information about Glitch they expected would be unimpressive to these peers, suggesting that they would be embarrassed by it.

Misleading and bragging about Glitch took many forms, but the most popular was to talk about how cool it was to be paid to play. The drudgery of the job was obscured when participants casually mentioned how they did game testing for a popular game, even when most of our testing was for less popular casual and social networking games. Although they used this type of bragging or “teasing” with many groups, it was something they talked most about with casual friends or acquaintances at school. They also told us that bragging about being on the Georgia Tech campus and working with friends was something that would impress people about their job, implying that their work was prestigious and fun.

Some participants did bring up negative aspects of Glitch to these peers. They talked about the difficulties of the job and how they were able to overcome these issues in a mature way. Although these difficulties were true, their stories about Glitch were presented to less close peers as a challenge (“You try it”) or with humor (“I had to see a chiropractor”) as subtle ways to brag about their summer job.
Conversely, the participants avoided any conversation about their interest in learning computing. With parents, the participants avoided conversations about learning computing. With peers, they did not want to express an interest in any academic learning, not just learning computing. They seemed to think talking about learning over the summer might be embarrassing because kids at school did not value self-driven learning.

Creating learning experiences that participants can present as something else is a specific strategy for providing face-saving tactics. This may allow participants to navigate around negative perceptions of those who seek out learning experiences. With some audiences, such as less close peers, the initial hook, such as video games in Glitch, was the way they presented the experience even after the glamour of that hook faded. In designing for an audience of young African American males we found that the prestige of being chosen to test games, working on a college campus, and overcoming adult challenges was presented as a way to impress their peers. In designing learning environments, hooks and experiences that are impressive to peers may be better strategies than popular media for long-term engagement.

**Male Peers Inside of Glitch**

We had observed that talking about women and competition were important parts of the daily life in Glitch and important parts of performing masculinity for the participants. However, these presentations of Glitch did not seem to be important outside of Glitch. Inside of Glitch these young men could not hide behind bragging about being paid to play, nor could they hide their interest in CS, yet they still used face-saving excuses to hide their interest in learning. In some ways these faces may hold the greatest opportunity for classroom application.

The opportunity to use competition as an excuse for trying hard was difficult to measure, but the pride that the participants exhibited not only in winning but also in being fierce competitors was apparent in observations. This pride in being competitive allowed participants to work hard at elements of Glitch and CS learning that were difficult and took a more concentrated effort than most $8-per-hour jobs expect. Applying elements of competition to a classroom setting is not a new idea. However, two key elements of the Glitch Points competition seem unique and resonated with our African American male participants. First, by making the point system public and the presentation of the points an event, we allowed for very public displays of competitive traits, thus allowing the participants to use the competition as a face-saving method in other circumstances. Second, the few large, authentically desirable prizes were more motivating than smaller, less expensive prizes.

The banter about meeting young women was an important part of bonding between some of the Glitch participants. Not all participants talked about meeting...
women on campus, but those who did used playful language. Because they did not appear to act on any of this talk, and because of the playful nature of these conversations, we speculate that it was predominantly posturing. Although being “smooth with the ladies” may not be an idealized face teachers would want students to present, we think that the presence of this type of presentation of self indicates the freedom the participants felt in the Glitch environment.

Designing learning environments that allow for these alternative identities, identities that conflict with mainstream American classrooms, may be key to drawing in marginalized groups. In Glitch this included designing so that face-saving tactics that were typical of the cool pose of African American masculinity were accepted behavior.

Close Friends and Techies

Although interest in computing was clear, participants only felt comfortable talking about CS among select groups of peers and teachers. Their willingness to talk about their interest in computing was based upon not being judged negatively. It seems that participants had two reasons for feeling comfortable talking about interest in computing. First, they trusted and felt comfortable talking with their best friends even if they had no interest in computing themselves. Second, they talked with others they perceived as having a similar interest, such as teachers, “geeky” friends, and coworkers at Glitch. Participants’ willingness to talk about interest in computing with the research staff indicates that the researchers were situated in this group as well. We find that these last two groups hold particular promise for sustaining participants’ interest in computing. With a community of interest around computing we have begun to see Glitch participants reach out on social networking sites and in college to one another and to other friends with an interest in technology.

In addition to designing for face saving there should be consideration of creating a community of practice for learners where they can drop their face-saving excuses and simply geek out. Glitch participants established a community within the Glitch program and extended it outside of Glitch in several ways, such as with college roommates, forming a company, and on social networking sites. These relationships, and perhaps even knowing these relationships can happen, may help African American males after they leave a learning environment and enter into predominantly White and Asian undergraduate CS programs.

RECOMMENDATIONS

This line of research began with the idea that games can be leveraged for sparking an interest in CS. This was proved correct. Young African American males were
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eager to have jobs that paid them to play games. However, subtleties in the details go far beyond that initial motivation. By framing our understanding of motivation around motivation to not learn we were able to uncover the face-saving tactics that the young men used to negotiate between maintaining cultural values and identifying with learning and CS. By obscuring their CS experiences as a part of holding down a cool job or trying to win a competition, these young men were able to enjoy learning without threatening their self-beliefs or cultural values.

Design Elements for Cultural Values of African American Males

Our formative research emphasized participatory design and purposefully created a value system in Glitch that would match that of our participants. These elements additionally, though unintentionally, ended up supporting face-saving tactics that allowed the participants to navigate conflicting motivations. By contextualizing Glitch with these different faces, participants could come in each day and learn programming without becoming a geek. Many of these design elements may be successfully applied to other learning environments for African American males.

**Value of Work.** We found that our design of the program as a paid job was motivating for reasons other than the money it provided. Some of this was because participants valued the adult responsibilities, such as having their own money, taking the bus to work each day, and being on their own in the city. We suggest giving African American males a purpose to participate beyond learning content, to keep them engaged and able to justify their behavior to others.

**Impressive Rather Than Popular.** At first we designed the program around games because they were popular media for our audience. As Glitch matured we observed that it was considered cool because it was an impressive job and it was difficult. “Stepping up” and being responsible for waking up early all summer and getting to work each day became a bragging point. We suggest building programs around factors that are impressive to young peoples’ communities beyond popular media or the newest technology. Building programs around cultural values may prove to be more sustainable than pop-culture interest for new learning interventions.

**Masculinity.** Because this was a work and not a school setting, we did not ask the participants to reframe their behavior. We treated them like employees, allowing them to bring their cultural practices into the environment as long as they got their work done. The everyday of Glitch included music, bragging about meeting women, trash talk, and some amazing jerk dancing, all of which might be considered somewhat typical displays of African American masculinity. Although
this masculinity was the normative behavior in Glitch, it is not the normative behavior in most classrooms. Allowing participants to shape the design of the learning environment in these ways may allow them to move beyond motivations to not learn.

Design Principles

These design elements may apply to other long-term learning environments targeting young African American males. But more general principles can be transferred to the design of other learning environments:

- **Consider caretakers.** Young people are concerned with what their parents or guardians value. Although these caretakers may value all different kinds of learning, young people may not recognize this and may want to present involvement in activities that will please their caretakers and not threaten established power balances. An example is the Glitch participants who talked about gaining experience on a college campus to their caretakers but avoided talking about learning computing.

- **Consider peers.** Designing experiences that can be perceived as impressive among peers may help young people persist and encourage them to give more time to learning activities. Although a learning experience may not be impressive to young people’s peers, one can still design elements that are impressive to peers. An example is that being paid to play was impressive to peers and hid the amount of time participants were spending on learning.

- **Respect students’ current attitudes.** What may seem at first to simply be undesirable negative attitudes about learning sometimes mask a web of complex social pressures. Do not demand that students drop those attitudes immediately on arriving at a learning environment. Many of our students initially put on a show of disdain for learning but gradually came to embrace affinity with learning goals (in their words, taking pride in being “geeky”) within Glitch.

- **Facilitate an ongoing community.** After participants move on in their education and leave a learning environment designed for their group, they can encounter a feeling of “otherness,” particularly if they are identified as an underrepresented group in that discipline. By facilitating an ongoing community, participants can maintain this sense of belonging and a community in which they feel safe. For example, some members of Glitch continue to stay in contact via social networks and continue to communicate about technical issues. If we had anticipated this need, we might have developed steps to help facilitate this community rather than have it develop ad hoc.
Future Work on Cultural Values and Learning

We began our work with a mystery: Because African American teenage boys are the most dedicated gamers, why does that interest not translate into an interest in CS as it does for many from other demographics? The answers we found to this question are not about knowledge, though knowledge may be a component. Young African American males know that education in technology fields can lead to success and stability, which they value, but they cannot see themselves on that path. Even the first step on that path does not fit into their view of themselves and the many faces they must present to everyone they care about. To find answers, we needed to understand their cultural values and the multidimensional pressures on their being and becoming.

In new work, we begin with another mystery: their parents. Why do some parents choose educational opportunities and enrichments in technology fields for their children and others do not? What makes a parent say “This is for my child”? Similarly, some piece of the puzzle is knowledge of what learning opportunities are out there, but other pieces remain unknown. We are applying the same methods to address this question. We expect that empirically understanding the many faces parents must present to other family members, other parents, and community members will play a central role in what they seek out for their children. This work is ongoing.

Future Work on Face Saving

Findings from the data demonstrate that there is not one correct face and that these young men represent Glitch in very different ways to different people in their lives. Although it was not the intention, the use of cultural values in designing Glitch and the inclusion of young African American males in the design process seemed to seed many of the face-saving tactics that subsequently occurred. These findings suggest that formative reflection on face saving as a method of addressing motivation to not learn could uncover more opportunities. We also uncovered some occurrences of misrepresentations of Glitch, such as avoiding conversations about CS, which may have had no relation to face saving. In future work we seek to refine methods for studying face saving. We propose the use of face saving as both a formative tool for design and a reflective tool for understanding motivations. Although face saving is not the only method for understanding motivations to not learn, we feel it is an opportune first step.

How much change can we expect from students? We started this article saying that it was rational for students from underrepresented groups to learn content like CS, as it will help them achieve success and stability of a certain kind. Students choose to not learn because they have values and face that are in opposition to that model of success and stability. By designing for face saving, we give students the
opportunity to learn, to gain content knowledge, skills, and experience, *without* also asking students to change their face: their identity, their cultural values, and their expectations for themselves. We might believe that these students *should* change their expectations for themselves, but if that change is the price we ask students to pay for the content knowledge, then we find few students willing to persist. If we do not demand that price, and instead give students multiple reasons to persist that allow them to save face with different members of their family and friends, then we can be more successful in increasing students’ interest and learning.

We suggest that designing for face saving will place the power in the hands of the learners, offering them different ways to maintain their cultural values while negotiating their own identity, community, and learning choices.

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**REFERENCES**


