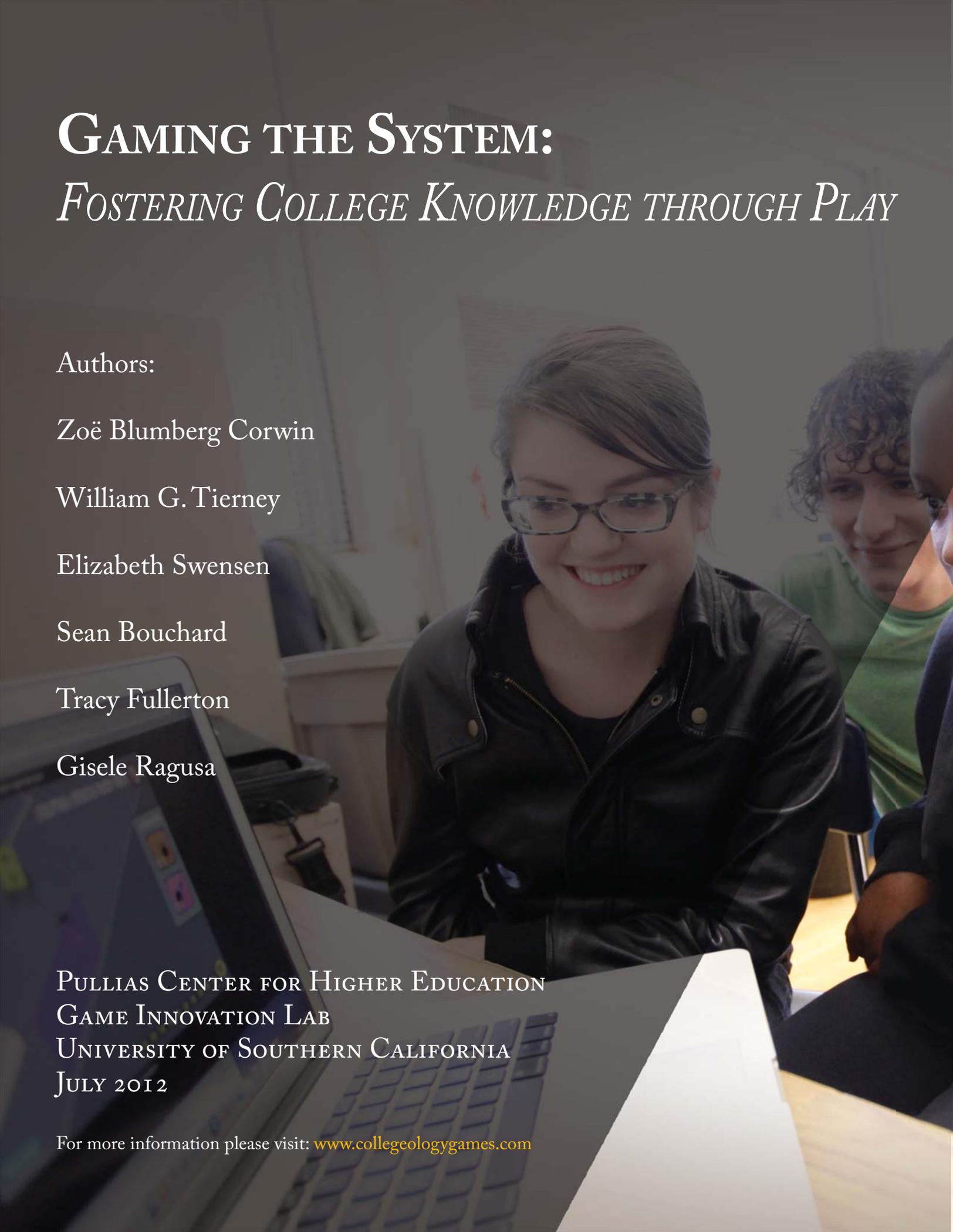




GAMING THE SYSTEM:

FOSTERING COLLEGE KNOWLEDGE THROUGH PLAY



GAMING THE SYSTEM: *FOSTERING COLLEGE KNOWLEDGE THROUGH PLAY*

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For more information please visit: www.collegeologygames.com



Background: The Problem

“The guidance counselor to student ratio hovers around 450:1 in America’s urban schools and surpasses 800:1 in California schools when it should be closer to 250:1.

Ensuring access to postsecondary education for low-income students does not simply entail educating students in core subjects. A critical aspect of readying students from poor and working class backgrounds for college or university hinges on boosting college aspirations and providing consistent support for college goals.

A key reason that more students do not attend college is because they lack the knowledge and skills to apply. The guidance counselor to student

ratio hovers around 450:1¹ in America’s urban schools and surpasses 800:1 in California schools when it should be closer to 250:1.² Without high quality college counseling, thousands of students across the nation remain oblivious of their postsecondary options. For students at underserved high schools who do know they want to attend college, not having access to appropriate college guidance makes preparing for, applying to, and choosing the right college extremely challenging.

Our research has found that far too often, information about college and financial aid is delivered in passive ways or in formats that serve a finite number of students. For example, students might sit and listen to a lecture from a college recruiter or navigate complex websites that share lots of great information but do not solicit active engagement from students. In other instances, the most effective mentoring programs or hands-on college outreach efforts are bound by resources and can only serve a fixed number of students. If as a nation we want to improve students’ access to college, we cannot afford to simply tweak existing models of college outreach. We need to move forward in innovative ways.

The *Collegeology Games* project capitalizes on cutting edge technology and a pioneering design process to develop students’ *college knowledge*, confidence, and drive to apply to, enroll in, and persist in college. In what follows, we share the rationale behind developing games to address such a serious problem, how the game intervention developed, the different components of the intervention, preliminary research findings supported by a grant from TG, and next steps in the project’s trajectory.

College knowledge includes understanding postsecondary curricular requirements, test policies, tuition costs, financial aid options and who to approach for assistance with postsecondary decisions.

¹ Collegeboard Advocacy and Policy Center, Student-to-Counselor Ratio, <<http://completionagenda.collegeboard.org/student-counselor-ratio>>, 2008.

² American School Counselor Association, Student to Counselor Ratio by State: 2009–10, <<http://www.schoolcounselor.org/files/Ratios09-10.pdf>>, 2010.

³ David T. Conley, *College Knowledge: What It Really Takes for Students to Succeed and What We Can Do to Get Them Ready* (San Francisco, CA: Jossey-Bass, 2005).

Target Market

HIGH SCHOOL POPULATION^{4,5}

1:3
average # in high poverty schools

2.6
average # full- and part-time counselors per public school

14.9+M
high school students in the US

6/10
jobs in U.S. economy depend on highly trained workers

37,100
high school in the US

TEENS AND TECHNOLOGY⁶

95%
of teens ages 12-17 use the Internet

7/10
of teen Internet users say they go online daily

of Internet using teens belong to social networking sites

80%

9/10
of teens ages 12-17 play computer, web, portable, or console games

97%
social media users have a Facebook account

⁴ National Center for Educational Statistics, Public School Enrollment, <http://nces.ed.gov/programs/coe/indicator_enl.asp>, 2012.

⁵ Patricia M. McDonough, "Counseling and College Counseling in America's High Schools," *National Association for College Admissions Counseling*, <<http://www.nacacnet.org/research/PublicationsResources/Marketplace/Documents/Counseling-In-AmericanHS.pdf>>, 2005.

⁶ Pew Internet and American Life Project, Internet Adoption Over Time by Teens and Adults, <<http://pewinternet.org/Reports/2011/Teens-and-social-media/Part-1/Internet-adoption.aspx>>, 2011.

Game-based Learning *continued*

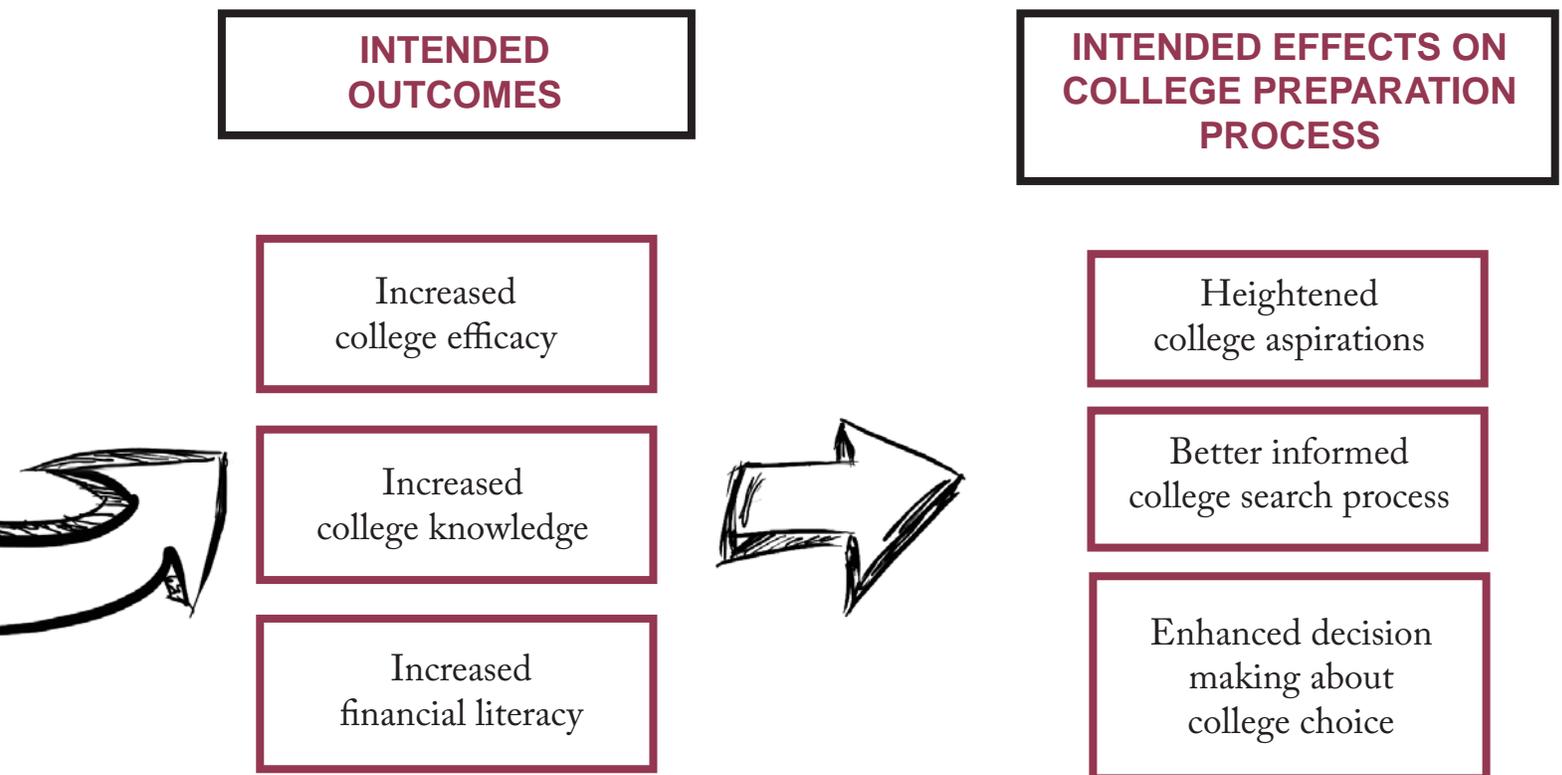
WHAT GAMES CAN DO ...

- Games are systems governed by rules.
- Games are won by mastering those rules.
- Games require motivation, focus, persistence.
- Games lead to the conversion of intention to action.
- Games increase problem solving skills and conceptual knowledge.
- Skills learned in games transfer to real-life situations.
- Game play develops positive attitudes towards subjects and tasks.

WHY DOES THIS MATTER?

- The college entrance process is also a system governed by rules.
- The goal of *Collegeology Games* is to provide a safe place to learn the college application rules and gain proficiency in pertinent skills and strategies in a risk free environment.

Theory of Change



From Idea to Game:



- **1. IDEA**

Create a scalable college access resource in a format that's engaging to students.



- **2. JUNIOR DESIGN CAMP**

Group of students from target audience convened to work with game designers to conceptualize game.



- **3. PAPER PROTOTYPE**

3x5 cards used to design game mechanic.



- **6. PLAY SOME MORE**

Card game played with students in Los Angeles and Houston; feedback solicited from national pool of practitioners; game revised according to feedback.



- **5. PATHFINDER**

Polished version of card game manufactured, sent out to practitioners across the country.



- **4. PLAYTEST**

Evolving versions of prototype tested with students and modified according to feedback.

The Iterative Design Process



- **7. APPLICATION CRUNCH**
Second edition of card game printed, renamed, manufactured, made available to broad audience through sale or request for complimentary copy.

- **10. MISSION: ADMISSION**
Facebook application game launched, available free of charge to national audience; game designers continue to update game based on feedback.



- **8. DIGITAL PROTOTYPE**
Facebook version of the game designed and developed in response to lessons learned from research on card game.



- **9. STUDENT FOCUS GROUPS**
Evolving versions of game playtested with students in Los Angeles and Houston; feedback solicited on game mechanics, narrative, and aesthetic appeal.

The Suite of *Collegeology Games*: *Application Crunch*



PLATFORM: Card Game

AUDIENCE: 10th & 11th graders;
12th graders (fall)

NUMBER OF PLAYERS: 3–4

GAMEPLAY DURATION: 60–90 minutes

LEARNING GOALS:

- To build college-related vocabulary
- To prioritize how to allocate time towards college preparation
- To understand the value of depth over breadth in extracurricular activities
- To learn and experiment with college-going strategies
- To increase understanding of actual college costs and financial aid opportunities

DESCRIPTION:

The goal of *Application Crunch* is to familiarize students with the college application process. Players take on the role of a high school student in the midst of applying to college. They have to figure out how to balance time among academics, extracurricular activities, work, and service while competing for college applications and scholarships. The objective of the game is to get into college, save enough money to pay for tuition and other expenses, and build up the kind of character who can succeed in his/her chosen school.

The game relies on standard game mechanics such as “leveling up” to indicate how players will spend their actions in the game. Through collaborative play players become familiar with terms and behaviors associated with successful college applications. For example, students learn the differences between various types of postsecondary institutions, the importance of applying to scholarships, and the value of specializing in an extracurricular activity.

The *Application Crunch* card game is an intervention specifically targeting environments and situations where a digital game might be problematic. It is especially appropriate for schools, after school programs, and home settings.

“I wish they had this game when I was applying to college a few months ago.”

–Juan, 12th grade student
Los Angeles

Application Crunch continued

HISTORY:

The first phase of the project entailed conceptualizing the initial card game (a prototype for the online game). After high school students provided input on the initial project design, the design team composed a vision document for the project. The team created a paper prototype of the game in the form of a deck of cards. Researchers and game designers play-tested the card game prototype with 100 low-income high school students and with practitioners who serve students from underrepresented groups. The design team revised the game several times in response to play-test feedback and subsequently manufactured 1,000 revised card games. In March 2010, we sent the card games to practitioners across the country with the request that recipients complete

“Applying early gives me an advantage because I set the standard. [My friends] see what I submit.”

*–Rashonda, 11th grade student
on her strategies on playing
Application Crunch
Houston*

an online questionnaire evaluating game play and testing students’ college knowledge. In addition, researchers and game designers played the game with over 340 low-income students in Los Angeles and Houston and then made revisions. We subsequently reprinted a second edition of the game called *Application Crunch* and have incorporated video **tutorials** as teacher/counselor support tools on the project website.



The Suite of *Collegeology Games*: *Mission: Admission*



PLATFORM: Facebook game

AUDIENCE: 10th & 11th graders;
12th graders (fall)

GAMEPLAY DURATION: 10 minutes a day
over the course of a week

LEARNING GOALS:

- To build college-related vocabulary
- To prioritize how to allocate time towards college preparation
- To understand how personal success affects others/community
- To understand the value of extracurricular leadership positions
- To learn and experiment with college-going strategies
- To increase understanding of financial aid opportunities
- To stimulate discussion around college knowledge with online peers

DESCRIPTION:

Mission: Admission is a digital adaptation of *Application Crunch*. Like the card game, the focus is the college application process. Players level up their characters in academics and extracurriculars, request letters of recommendation, and put time into application essays all while keeping an eye on a calendar of deadlines that spans a real-time week.

In each week of *Mission: Admission*, players guide a different character towards higher education by applying to colleges and scholarships and meeting that character's unique academic interests. Players have the opportunity to compete with one another by earning badges related to their character's interests. When players accomplish key tasks within the game, such as gaining a college acceptance, they earn pride points. Pride points can be used to

“I didn't know about the things you had to do, just to make you better for colleges to accept you. I didn't know there were city colleges or country colleges. I guess it made me think more about what I want to do.”

–Mario, 11th grade student
Los Angeles

Mission: Admission continued

improve a player's virtual school environment by using them to buy items such as recycling bins, basketball hoops, debate stands, etc.

HISTORY:

Translating the card game into digital form entailed an extensive series of playtest sessions and iterations on the design. During the first sessions, we worked with students in Los Angeles and Houston to gain feedback on game mechanics and narrative. As the designers and programmers built the digital prototype, they met with students for input on game aesthetics (i.e., what the characters and school environment should look like). Playtests continued in USC's Game Innovation Lab to assess the effectiveness of rules and tutorials. We then requested feedback from 100 students, practitioners, and game designers on the initial version of the full online game. As more people play, we continue to make adjustments.

“Yeah, we use Facebook to remind each other to turn in papers to our college counselor or when there are deadlines.”

*– Luisa, 12th grade student
Los Angeles*

To access the game visit:

<http://apps.facebook.com/missionadmission>



Research Design

STUDY OBJECTIVES:

- Inform understandings of how game-based technologies can better promote college going among low-income high school students
- Enhance the effectiveness of the game intervention

OVERARCHING RESEARCH QUESTIONS:

- How does the game intervention affect players' college knowledge and college-going efficacy?
- How does “context” affect digital technology use for students from low-income/minority backgrounds?
- What role do peers, teachers, counselors, and family members/guardians play in supporting students' digital learning and college aspirations/plans/behaviors?

PHASE

1.

CARD GAME:

Application Crunch

Iterative playtesting of game prototypes

- 20 sessions with approximately 60 participants (Los Angeles & Houston)

Observations & Questionnaires

- 104 students played the card game once (Los Angeles)
- 180 played card game twice (Los Angeles & Houston); 50 students filled out post-game questionnaires
- 40 played online game (Los Angeles)

Interviews or Focus groups

- 20 students in Houston
- 40 students in Los Angeles
- 20 teacher and practitioner participants

Surveys

- 874 students in Los Angeles and Houston*

PHASE

2.

ONLINE GAME:

Mission: Admission

Iterative playtesting sessions

- 15 sessions with approximately 40 participants (Los Angeles & Houston)

Observations

- 50 students in 2 Los Angeles classrooms

Interviews & Focus groups

- 40 students (Los Angeles)
- 10 teachers and practitioners (Los Angeles)

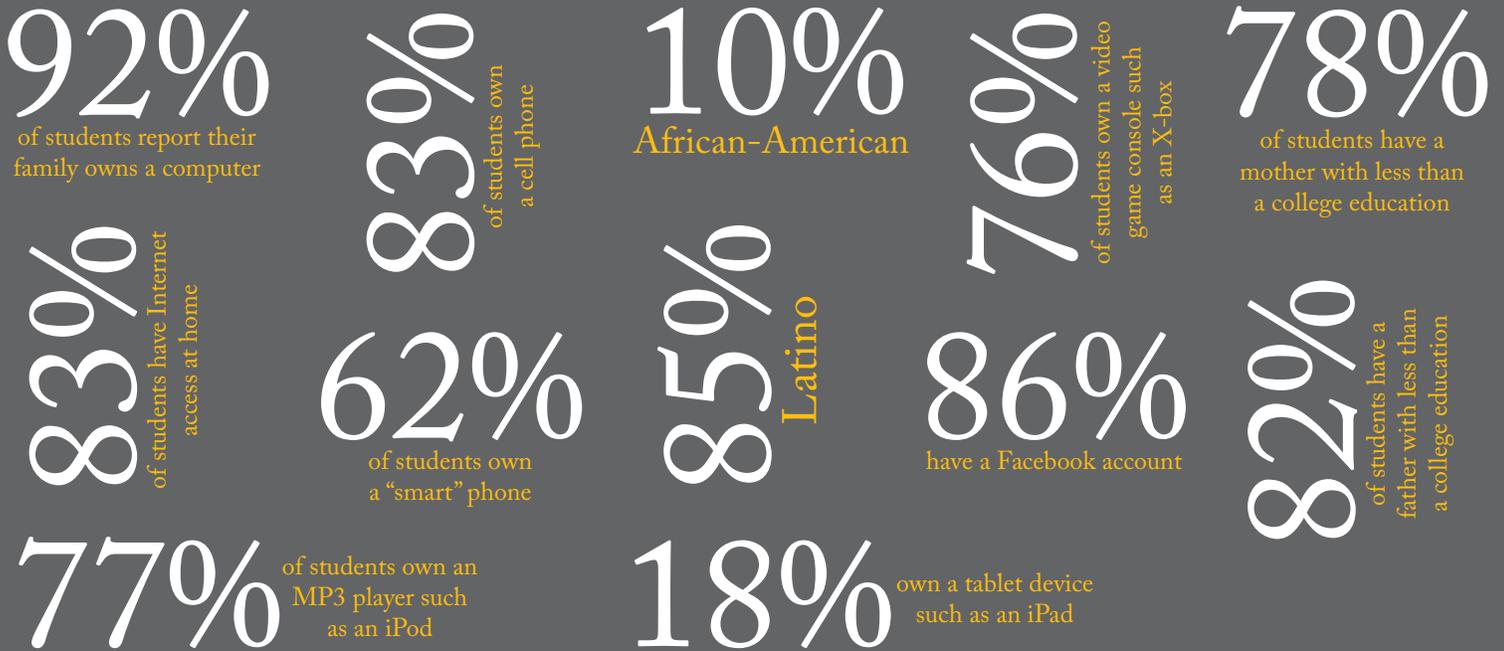
Pre-post tests

- 246 high school juniors* (Los Angeles)
- Intervention group included 50 playtesters in (Los Angeles)

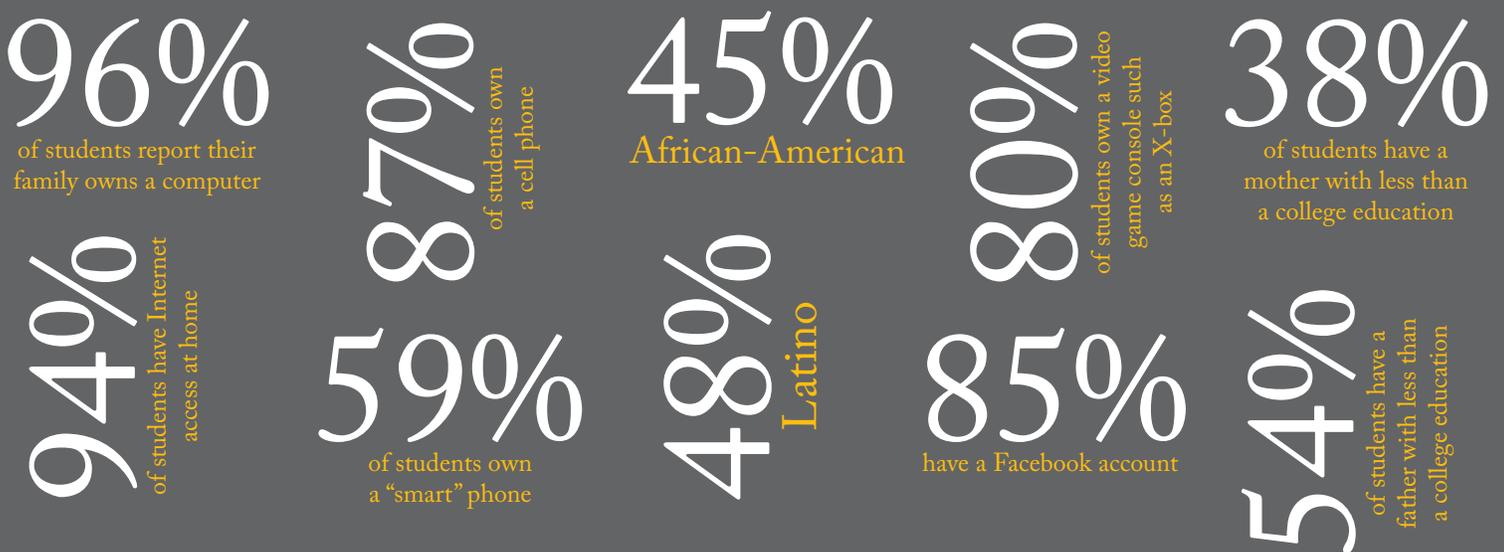
*Sample characteristics described on the next page.

Study Sample: Digital Ownership & Use

LOS ANGELES SAMPLE N = 937



HOUSTON SAMPLE N = 183



Research Findings:

Observations, Interviews & Focus groups

The iterative design process involved multiple play sessions and focus groups with small groups of students from the target audience during the entire design and development process of both games. Feedback garnered during these sessions informed subsequent revisions to each game. We conducted more formal observations of game play in classrooms in Los Angeles and Houston. In addition, we conducted interviews or focus groups with a subset of student players to explore what they had learned playing the game(s), how their game-playing strategy developed during play sessions, and to learn more about their digital usage at school and home. We also conducted informal interviews and semi-structured focus groups with teachers and practitioners to gather their perspectives on utility of the games and ideas for implementing the games in classrooms.

Thematic analyses of these observations and interviews suggest that the initial games promoted the below qualities conducive to college preparation:



- **Awareness**: The games helped students expand their awareness about college admission and financial aid processes. Students expressed that they had learned the differences among college types (e.g., 2 year, 4 year, private, etc.), the different requirements by postsecondary type, and that the financial aid and college admissions processes were not mutually exclusive.
- **College literacy**: Players learned new college vocabulary and used the vocabulary during game play (use of new vocabulary was more pronounced when students played either game two or more times).
- **Ability to apply role playing to real life applications**: Students drew multiple parallels between their real world lives and their fictional game “characters” (e.g., if a character was accepted at a selective private university—a student player might say “like USC!”).
- **College application strategy**: Students articulated that among the most prevalent lessons they learned were: the importance of paying attention to deadlines, balancing academics and extracurricular activities, planning ahead when requesting letters of recommendation, and applying for financial aid while applying to college. Observational data documented similar themes in how students’ strategies developed during game play.
- **Collaboration**: Students who played the card and online games appeared to care about each other’s success during game play. Most students tended to help each other to compile strong college applications and navigate game play. Many students verbally shared their strategies while playing by explaining their decisions during each turn.
- **Competitive edge**: There was a friendly sense of competition that students displayed once it was clear that all game players understood the rules and flow of the game. Competition

Research Findings: *continued*

usually dissipated if it became apparent that a player might not meet college requirements.

- **Engagement in college preparation activities:** Systematic time-on-task data revealed that the card game held students' attention for prolonged periods. The vast majority of observed players continued playing the card game for at least 60 minutes. In interviews, card and online game players stated that they would play the game again and would invite their peers to play.

SOCIAL CONTEXT OF GAME PLAY

Interview and focus group data revealed the following findings related to peer/parent influence on digital use and the social context of game play:

- **Context of game play matters:** School culture affected if students communicated with peers about college and financial aid deadlines via Facebook.
- **Internet/Social media as college resources are limited:** Students could state popular college-related websites, but were not conversant in how to use the websites. Students learned about college indirectly through Facebook posts from older students and siblings.
- **Use of technology and games vary:** Time spent playing games or using social media and preferred online activities varied tremendously among students.
- **Cost and limited time are not deterrents to online activity:** Avid technology users were savvy about when they played games or used social media and how they afforded new games and technology.
- **Parents did not closely monitor games or online use:** Most students reported that their parents were not involved with their online use; parental support of time spent online varied.
- **Access to technology remains a challenge:** Many students in the sample either did not have Internet access at home or preferred to use their mobile phones rather than desktops/laptops.

“I do homework, have dinner, then play games until like midnight or 1:00 a.m. When our light bill comes, it’s kinda high. My mom gets mad.”

Researcher:

DOES YOUR MOM MIND THAT YOU SPEND SO MUCH TIME PLAYING GAMES?

“She prefers us being at home than being in gangs.”

–*Eduardo, 11th grade student
Houston*

Research Findings: Questionnaires & Surveys

In order to assess the effectiveness of the games in building college knowledge and increasing college-going efficacy, we administered pre- and post-tests to 874 students with a game-playing intervention group of 284. Of those students, we administered open-ended questionnaires to 50 card game players and administered pre- and post-tests to a group of 246 high school juniors. Of the 246 students, 50 participated in a self-selected intervention group. Students in the intervention group were asked to play the online game at home. Pre- and post-tests were administered to all students at the same time with the intervention played in between.

“I think it gives students a great, early snapshot into what they can expect for college. It’s a wonderful experience.”

–High school teacher
on the effects of
Application Crunch
Los Angeles

APPLICATION CRUNCH FINDINGS

We administered an open-ended survey to 50 students after they played the card game. Students wrote responses to the two questions listed below. Answers were grouped thematically, parentheses indicate frequency of responses. The top five most frequent responses to question one illustrate the types of college knowledge students learned playing. Most popular responses to question two illustrate strategies learned through game play.

WHAT DID YOU LEARN?

- Different types of college that exist/ requirements for different schools/ schools look for different things/what to put in applications (15)
- Importance of doing activities, such as extracurriculars and service to make your application competitive (12)
- Importance of time management/ keeping track of deadlines (11)
- What college costs (11)
- Different types of financial aid available (10)

WHAT WILL YOU TRY DIFFERENTLY THE NEXT TIME YOU PLAY?

- Make smart decisions/strategize/try and get good productivity cards/stay organized/keep track of everything/ spread out card in envelopes (15)
- Apply to a wide range of schools (14)
- Manage time better/pay attention to deadlines (13)
- Earn more money/apply to scholarships (10)
- Stay focused/take seriously (3)
- Do more community service (3)

Research Findings: *continued*

“I would like to see [Collegeology Games] spread. I would like for my little brother and cousin to play it.”

–Katya, 12th grade student
Los Angeles

MISSION: ADMISSION FINDINGS

We administered pre- and post-tests to students at four Los Angeles high schools. Out of the 246 longitudinal cases, 50 students—the intervention group—played the game at least once. Among respondents who played, 52% played the game two or more times. We were most interested in differences in college-going efficacy scores between game players and respondents who did not play the game. We analyzed these differences in several ways. First, we conducted t-tests to examine post-test college going efficacy score differences between game players and those individuals who did not play the game. Next, we regressed the post-test scores on a set of covariates collected from the initial survey (e.g., pre-tested college-going efficacy, gender, race, technology use). Finally, we used propensity score matching to make the treatment (game player) and control (non-game player) groups more equivalent. Analysis shows:

ONE-TIME GAME PLAY DOES NOT AFFECT COLLEGE-GOING EFFICACY.

The t-tests and regression models did not detect significant differences between game players and non-game players when we defined game players as anyone who attempted to play a partial game or who played the game one time.

COLLEGE-GOING EFFICACY INCREASES WITH SECOND TIME (AND SUBSEQUENT) GAMES PLAYED.

We consistently found significant differences in college-going efficacy post-tests across all three analyses when we defined game players as those participants who played the game at least two times. We detected significantly higher post-test scores for college-going efficacy for participants who played the game two or more times. Using several propensity score matching methods (e.g., nearest neighbor, caliper, kernel), we found that respondents who played the game at least twice scored about 0.4 standard deviations higher on the college going efficacy measure compared to their peers who did not play the game or played the game only once.

These findings reflect a core principle of game design—that learning occurs after a player fails, practices new strategies, and then masters a skill or strategy. Qualitative observations documented a similar trend. Importantly, these results are preliminary and with a small sample size should be referenced cautiously. Future research on *Mission: Admission* will investigate these themes with a larger sample.

Concluding thoughts

DEVELOPMENT

The Collegeology Games suite currently consists of four games. With additional funding, we will continue to develop games to reach a wider audience. The next page outlines current and potential games.

FUTURE RESEARCH

Significant attention and resources have been dedicated to social media and games for education. Yet we still know very little about the rapidly changing digital landscape as a tool for college access. In particular, we lack a solid understanding of how low-income students are engaging with games, social media, and technology. Study findings point to the need to further explore the social context of game play and digital use in order to better understand how each might be utilized as college resources.

Proponents of games extol their virtues; critics voice skepticism over their utility. As we conducted research on the card and online games, we recognized the challenges and importance of developing robust tools to address the effects of games on learning, in particular as tools for college access.

IMPLEMENTATION

Feedback from teachers and counselors underlined the need to provide practitioners with tools to implement games in classrooms and college preparation programs. Video tutorials are now available through www.collegeologygames.com to guide game set up and play.

As we scale up the games and ready them for national dissemination, we will focus on outreach to school leaders and practitioners as well as students and their families. Developing partnerships with key organizations is key to creating awareness of the games and facilitating their use as college access tools.

SUSTAINABILITY & GROWTH

Sustaining the current games is contingent on securing funding for distribution (sales and marketing—even for open access games), updates (to keep content current and to customize games to specific audiences), and implementation (outreach and customer support to practitioner groups). *Application Crunch* sales cover the costs of mailing and reprinting card games as well as pro bono games given to organizations serving Title I students. To sustain the online game requires funding to cover hosting the game online and maintaining programming updates and patches.

Funding scenarios for future games include grant awards, social venture funding, and game sponsorship.

From Game to Games: The *Collegeology Games* Suite

EXISTING GAMES

Application Crunch

1.

A card game for high school junior and seniors, *Application Crunch* focuses on how to put together college applications, navigate the process, and manage time efficiently.

Mission: Admission

2.

A Facebook game, *Mission: Admission* takes the card game online, helping juniors and seniors understand the college application and financial aid processes.

GAMES IN PRODUCTION

FutureBound

1.

Collegeology Games will soon release *FutureBound*, a digital game for middle school students. The game helps players identify career and college aspirations and emphasizes how the decisions a student makes in middle school can influence future opportunities in high school, college, and career.

College Choice/Financial Literacy

2.

Collegeology Games is currently developing plans to release a financial literacy and college choice game for high school juniors and seniors. The game will focus on developing strategies for students to identify the right college fit, understand and find multiple financial aid opportunities, and make informed decisions based on college and financial knowledge.

FUTURE GAMES

Elementary School

1.

Elementary school products will focus on the introduction of the idea of college, basic vocabulary building, and career awareness through a board game and flash cartoon. They seek to answer early questions like: What is college? What jobs can I have when I grow up? How can college help me do what I want?

First Year of College

2.

A first year of college game will include activities to encourage developing social support, time and finance management, and participation and engagement in college culture.

Non Traditional/Returning Student

3.

For those who choose to go to college some years after the end of high school, an iPhone and web application will facilitate the exploration of options unique to nontraditional students. The game will encourage players to reinvest in their education, and examine the broader time management skills one must have to balance school and adult life.

Certificate/Degree Completion

4.

Getting into college is the first step. This game focuses on empowering low-income, first-generation, full- and part-time, young and working students, to successfully navigate college programs through degree completion.

Useful Resources

RESEARCH – BASED RESOURCES

Pew Internet & American Life Project

Offers research on the impact of the Internet on children, families, communities, the work place, schools, health care, and civic/political life.

<http://www.pewinternet.org/>

MacArthur Foundation: Digital Media & Learning

Highlights new modes of learning observed among young people using digital media and related tools.

<http://www.macfound.org/programs/learning/>

Digital Literacy Portal

Houses a portal designed for practitioners who are delivering digital literacy training and services in their communities; offers resources, discussion and collaboration among users.

<http://www.digitalliteracy.gov/>

Connected Learning Research Network

Facilitates the interaction of an interdisciplinary research network dedicated to understanding the opportunities and risks for learning afforded by today's changing media ecology.

<http://clrn.dmlhub.net/>

ONLINE RESOURCES FOR STUDENTS, FAMILIES AND PRACTITIONERS

KnowHow2GO

Targets middle school and high schools students with motivational messages and information about preparing for college.

<http://www.knowhow2go.org/>

CollegeBoard

Provides information and tools about college for teachers, guidance counselors and students.

<http://www.collegeboard.org/>

Fastweb

Matches users with relevant scholarship opportunities free of charge.

<http://www.fastweb.com/>

COLLEGEOLGY GAMES

COLLABORATORS:

- *USC Rossier School of Education's Pullias Center for Higher Education* is a nationally prominent, interdisciplinary research center focused on university governance and increasing access to college.
- *USC School of Cinematic Arts' Game Innovation Lab* is a research space and think tank with a mission to stretch the boundaries of how we think about and use games in society.
- *USC Rossier School of Education's Center for Outcomes Research and Evaluation* engages in high quality, outcomes-based academic, and evaluative research in P–12 and higher education settings.
- *Los Angeles Unified School District, Foshay Learning Center, Houston Area Schools, Houston A+ Challenge.*

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