Let's Improve Tanner High School

An Education Policy Game

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Preface

In FY18 the authors developed an education policy game that would reveal the perspectives of different stakeholder groups on current education issues. The larger purpose of this effort was to broaden the scope of the RAND Corporation’s game development expertise and supplement the analytic tools available for researchers working in RAND’s Education and Labor division. This document describes the game we developed, Let’s Improve Tanner High School, and offers some thoughts on game development and improvement based on a pilot test of the game conducted with RAND researchers and an operational use of the game with education stakeholders in Pittsburgh, Pennsylvania. This effort was funded by gifts from RAND supports and income from operations.
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Acknowledgments

The tool summarized here was developed with support from the RAND Corporation. In addition, our interest in and understanding of policy gaming was fostered by interactions with David Shlapak and others in the RAND Center for Gaming. In particular, David Shlapak, Elizabeth Bartels and Diana Carew offered invaluable advice on framing the problem in a manner suitable for gaming, adopting an appropriate approach to the game, and selecting specific game strategies. During early stages of game development we conducted brainstorming sessions with researchers working in RAND education, and their input was helpful in focusing our efforts. This group included Susan Gates, Laura Hamilton, Becki Herman, Elaine Wang and Stephani Wrabel. We conducted a pilot test of the game with RAND staff in Washington DC, and their participation and feedback were extremely helpful in improving the game. We played the game for the first time with a public audience in RAND’s Pittsburgh office, and we want to thank the teachers, principals, parents, business leaders and community leaders who shared their time with us that evening, helping us further refine the parameters of the game and understand its strengths and limitations.
1. Introduction

Let’s Improve Tanner High School is an education policy game developed by researchers in RAND Education with two purposes in mind. Its immediate purpose is to reveal the underlying beliefs and priorities of different stakeholder groups about current education policy issues, such as how to address budget shortfalls public schools often face. A secondary purpose of the project is to build the capacity of researchers in RAND Education to develop and use policy games as tools to understand the environment in which education policy is formulated, enacted and implemented.

The following brief chapters describe the specific objectives of the game (what we were trying to accomplish), the elements of the game (how it is played), and the materials that were produced to be used in playing the game. The chapters are designed to answer the general questions RAND asks about tools developed for research purposes. We have adapted the questions to be appropriate for describing the policy game tool we developed. The concluding chapter provides a summary of what we learned from the two initial pilot tests of the game that were conducted with RAND researchers (playing the rolls of stakeholders) and with actual stakeholders in Pittsburgh, Pennsylvania.
2. Objectives of the Game

An education policy game is a tool that addresses an issue of current importance to education policy. The objectives of “Let’s Improve Tanner High School” are to provide researchers and game participants insights into the preferences, motives, and beliefs of different education stakeholders (e.g., teachers, administrators, parents, community-based organizations) and the ideas these stakeholders hold about how school leaders should confront the challenges they routinely face as state, district and local conditions change. The debate about policies or initiatives (e.g., school choice policies) can elicit strong feelings from opponents and proponents, who have limited information about each other’s underlying motivations and priorities. Through game play we will be able to discover more about the beliefs held by competing groups and the trade-offs they are willing to entertain. We believe the value of this game to policy analysis comes from playing it repeatedly with different groups and monitoring the discussions that occur and the positions of different constituencies. It will help researchers and game participants understand the beliefs and convictions held by teachers, by parents, and by other stakeholders that should be considered in policymaking.

The RAND Education and Labor Division also hopes that developing “Let’s Improve Tanner High School” will improve our analytic skills, understanding of diverse perspectives on policy, and our policy recommendations. The education sector has many stakeholders whose perspectives are relevant to policy, and there are numerous issues beyond school improvement where conflicting perspectives need to be accommodated to achieve the best outcomes. Thus, the secondary purpose of this RSR project was to develop gaming skills among researchers in the Education and Labor Division and broaden the set of research tools education researchers could call upon to address policy issues that are often not subject to direct experimentation. The experience of developing and playing this game will extend RAND’s gaming capability into the education sector, where it has never been used before. In addition, it will build RAND Education and Labor’s capacity to investigate emerging issues in public education. “Let’s Improve Tanner High School” could, in fact, yield creative new approaches to serving students better (e.g., different arrangements of space, time, subject matter, etc.), and it will certainly provide insights into the values held by different stakeholder groups.

Why are These Objectives Well Informed By a Game?

The education policy game offers players a dynamic, first-hand experience of real-life problems and an opportunity to have sustained, problem-focused interactions. The “Let’s Improve Tanner High School” game is played in multiple rounds, and each round prompts the players to respond to a realistic challenge in education (e.g., the state cuts the education budget).
Players are arranged in teams representing stakeholder groups (e.g., four real teachers form the game’s teacher group), and each group must share its proposal and recommendations for addressing the challenge with the other game players who represent the broader education community. At the end of each round, all the players vote on the most promising proposal that is not their own.

The game play is designed to get players to think creatively about tradeoffs, surface the tension embedded in competing interest of the different stakeholders, and spark communication within and across stakeholder groups. The game makes visible the perspectives of the different stakeholders and their ideas about how school leaders should respond to the challenges. Ideally, in the simulated world of the game, participants will be able to voice their true opinions, offer options that might be considered “unrealistic” in the real world, and focus on issues, actions and perspectives that matter most to them. In contrast, when confronting problems in the real world, these same actors may feel constrained by politics, personalities, and the complexities of educational practice to offer more sanitized, socially acceptable and moderated views.

**What Types of Information is the Game Designed to Generate?**

“Let’s Improve Tanner High School” was designed to help researchers understand what different stakeholders value. By having different groups play the game while RAND researchers observe, we can learn more about the perspectives of key education stakeholders, such as teachers, parents, students, school administrators, community leaders, politicians and other actors. Initially the factors we hoped to incorporate into game play included having to make choices among resources (facilities, teachers, technology, etc.), having to prioritize potentially competing outcomes (academic achievement, social and emotional learning, etc.), having to balance different values (diversity, accelerated learning, community input, etc.), and having to meet certain required conditions (access, financial stability, accountability, etc.). In the context of the game, we hope that more diverse, committed and creative options may surface. In addition, stakeholder teams may reveal through their conversations and recommendations the options and opportunities that mean the most to them.

From a research perspective, the goal of the game is not to find out which team wins or even to come up with a thoughtful, integrated solution to a particular challenge. The goal is to learn what different stakeholder groups value, how strong their priorities are, and what trade-offs they might be willing to make. Rather than serving as a mechanism to test hypotheses, “Let’s Improve Tanner High School” is designed to help researchers better understand the perspectives of key actors in the world of education and perhaps develop theories about them. This information is potentially valuable to researchers hoping to inform policymakers about the efficacy and pitfalls inherent in different policy options.
On What Grounds Can You Use the Information Generated to Tell You Something Useful about the Real World?

As described above “Let’s Improve Tanner High School” is designed to help researchers develop hypotheses about the perspectives of key actors in the world of education. Thus, to be useful as a data collection tool, we would need to know that our stakeholders represent their beliefs and opinions accurately during game play. There are probably a number of ways in which a researcher could draw incorrect inferences about stakeholders’ true opinions from observing teams playing “Let’s Improve Tanner High School.” Threats to the validity of inferences include the use of unrepresentative groups of stakeholders (“sampling error”), the unwillingness of game players to voice their actual beliefs and attitudes for a variety of reasons (“response error”), and incorrect impressions formed from observing discussions and presentations during the game (“observer error”).

From our limited experience with the game, we cannot accurately judge the size of potential sampling errors, response errors or observer errors, but our observations suggest that game play provides a reasonable basis for drawing inferences about the attitudes of game players. We played the game twice during the development process, once with RAND researchers who were assigned roles representing different educational constituents and once with real stakeholders living in Pittsburgh, PA. These pilot tests allowed us to see how well aspects of the game functioned and they also gave us some information (although far from definitive) about the quality of information that could be learned from the game.

The initial pilot test at RAND was most helpful in learning how well proposed scenarios worked as prompts for discussion, whether game materials provided sufficient context and information, what aspects of the game play needed fine-tuning, estimating the timing of game, etc. The second pilot provided evidence about game play with real stakeholders, which was valuable for improving the substance of the game, but it also gave us initial information about stakeholder engagement, focus on evidence, difference in perspectives, and other information that is relevant to drawing inferences from game play. With respect to sampling error, our impression based on informal “listening in” during group deliberations is that within group variation in thinking was much less than between group variation. That is, one teacher’s responses to each challenge were more similar to other teachers’ responses than to the responses of principals, community leaders, etc. This was true for most groups, although perhaps less so for community leaders who seemed to have the most diverse points of view. This evidence suggests that the groups, other than community leaders, were presenting points of view shared by everyone in the group, which speaks to the representativeness of the groups. However, we did not systematically collect data on the within group discussions that occurred prior to the teams reporting out their thoughts and recommendations. It is possible that there was significant diversity of opinion within the groups that we simply did not observe.
We have much less insight into potential response error. It appeared that people were being candid and that different stakeholder groups offered different responses that were related to their background, knowledge and experiences. It was also the case that some groups offered suggestions that would likely be unacceptable in a real setting, e.g., reducing budgets by eliminating competitive sports teams. After the game in Pittsburgh, many participants stayed to talk with us, and they were not hesitant to tell us their opinions—both about the game and about the solutions that were offered. At least in these cases, participants did not seem to be censoring themselves when it came to presenting iconoclastic ideas to the whole group or to us individually. There could certainly have been some self-censoring going on, and many of the responses embodied familiar, well-tested approaches, but we did not see evidence of strong response error.

Based on these two pilot experiences, we are unable to judge the errors in our own perceptions (observer error), but our separate impressions about the teams’ responses (and the effectiveness of game play) were similar.

What are the Limitations of What the Game Can Tell Us?

We are still learning how much the simulation reveals stakeholders’ true feelings, understanding and preferences. Since the game setting presents a simplified version of a real school, and the game challenges are simplified descriptions of events, we imagine that the players’ responses are also simplified representations of their actual thinking. Similarly, since the game is played in an artificial setting, under artificial time constraints, we suspect that responses are also less thoughtful and complex than they might be in the real world. Yet, we think the game is helpful to understanding the priorities and perspective of different groups. We also have to remember that the game is likely to unfold differently in different locations reflecting the local organization of schools, history of education policy and recent events. We have to remind ourselves that the game is not designed to tell us how anyone will react or how anyone should react to similar challenges. It is designed to reveal what matters to different groups, and it appears to accomplish this goal to some extent.

Based on our experiences with real stakeholder groups in Pittsburgh, it is clear that the nature of the challenges will affect the groups’ abilities to respond and the sophistication of their solutions. When we posed a problem involving a racially charged incident in a classroom, the response from the school leaders was more thorough and thoughtful than the responses from the other groups. It was clear that the school leaders had relevant knowledge and experience, and it may have been the case that some had received training on dealing with this type of incident. Their response was widely endorsed by the other groups and they received many votes at the end of the game, probably because they brought such relevant expertise to bear.

The larger point is that each group will bring different backgrounds and experiences to bear on specific challenges. As a result, the choice of challenge is likely to affect game play. As we
describe below (see the description of the Pittsburgh pilot), when we posed a short-term, tactical challenge, the school administrator group could draw on relevant experiences to craft a thoughtful response. The community leader group had the most creative response to a more long-term, strategic challenge. Of course, the point of the game for RAND is not which group gets the most points, but what ideas are presented. Nevertheless, it is important that the challenges engage the groups and offer each one a reasonable opportunity to bring their ideas to bear.
3. Elements of the Game

**Actors**

The purpose of the game is to reveal the thinking of different education stakeholder groups about important education policy issues, so the people who play the game are drawn from these groups—students, teachers, parents, school administrators, community members, business leaders, etc. In the game itself, there is only one key character—the Acting Principal of Tanner High School. The players all assume the role of “advisor” to the Acting Principal. In some challenges, other educational stakeholder characters appear—e.g., hypothetical students, community members, policymakers—but their actions are only relevant to the particular challenge and are fully defined in the description of the challenge. The players do not assume any character roles other than themselves during the game.

**Objectives and red lines.** The objective for the participating teams is to formulate the best recommendations in response to the challenges raised in the game, drawing upon their experiences and opinions and the conditions at Tanner High School described in the game. The game itself does not involve moves, trades, or exchanges that might entail different objectives, rules, constraints or varying incentives. The Tanner High context does create some constraints in terms of school resources (facilities, budgets, staffing), expectations (student performance, community priorities), etc. However, there are very few red lines for participants other than civility and potential embarrassment if they offer a response that is too unusual.

**Resources.** The participants bring with them all the knowledge and information they need to play the game. That is, the game is designed to capitalize on, and reveal the players’ existing thoughts, priorities and insights. The game scenario sets up the conditions of play, the Fast Facts, map of the school, and Introduction establish the situation and provide background information that players draw upon. All players have access to the same information about the school.

**Player characteristics and how they impact findings** The players of the game are drawn from relevant stakeholder groups: including students, teachers, administrators, parents, community members, business leaders, and community-based organizations. In the course of game play, a number of challenges for the school are raised, and the teams of players huddle among themselves to discuss ways the school might respond to the challenge and formulate recommendations. Their actions do not affect the game scenario, at all. Each team presents its recommendations and responds to questions (from the other teams or from the game facilitator).
Their responses are evaluated by the other teams, and at the end of each round of the game, each player votes for the team(s) whose recommendation they believe is most likely to succeed.

Environment

Problem to be solved. The game is played in multiple rounds, and each round uses a different problem. The challenges used in the game are as follows:

1. The legislature cuts funding to schools statewide, requiring a 5% reduction in expenditures retroactive to this academic year. The district absorbs some of the loss, but like all schools in the district, Tanner must reduce its budget by 4%. This is roughly equivalent to four full-time teachers or seven administrative support staff. It is difficult to find outside funds (e.g., foundations, community organizations) to make up the deficit since all schools in the state are facing cuts and many are looking for other sources of income.

2. Students walk out in protest over perceived racially insensitive remarks from a teacher. The district opens a formal investigation, which will include a thorough review of the accusation. But, at this point, the investigation is still ongoing, so it is not yet clear what was or was not said. However, a number of students continue to boycott classes in response to the incident. Both the school board and teacher organization have issued statements denouncing racism, but tensions at Tanner remain high.

3. The annual college-going report finds that fewer Tanner graduates enrolled in post-secondary education last year than in the two previous years.

4. A suspicious fire occurs overnight in a storage room. Firefighters are able to limit the damage to just the storage room, but all the supplies used by the science program are destroyed, and the school has to close for one day. There are rumors that the fire was set by a student but no proof.

5. A group of parents complains that the school does not offer enough AP classes and threatens to transfer their children to another school next year.

6. The district has funds to expand career and technical education, and Tanner is in line to receive one industry-focused career-technical education sequence of courses. However, the school must make a case for receiving the program and must identify an industry/career focus.

7. State adopts new technology literacy requirement for graduation, and schools have 3 years to offer all students a one semester course or alternatives.

Scenario context. The players are given the following scenario describing the context of the game.

Xavier R. Tanner High School is a comprehensive high school in a large metropolitan area. Tanner High School opened in 1975 with a freshman class of about 400 students. A new group of 9th graders was added each year, and the founding freshman became the first Tanner graduates
in 1979. By that time the school had grown to about 1,600 students in grade 9-12. In honor of its first graduates, the student body adopted a school mascot and motto. Since then, the Tanner “Tigers” have been moderately successful in athletics but have struggled in terms of academic performance. The school’s motto, “Strive!” sometimes rings hollow when you look at student performance, and Tanner is not close to meeting its goal of preparing all students to meet state standards and graduate prepared for college and careers. In 2005, the school’s athletic facilities were remodeled and some classrooms were upgraded with cabling for computers, but very few computers were added. Fast Facts about Tanner High School describes the students, staff, courses and budget. The school’s physical layout is shown in the accompanying map.

Tanner’s neighborhood is not unusual for the area, containing a mixture of residential housing, small service businesses and a few vacant storefronts. The neighborhood is served by bus lines and a branch of the metropolitan rail line. There is a two-year community college about 10 minutes away by rail, and a branch of the state university is located about 20 minutes away by car (or 30 minutes by bus).

Last year, the district negotiated a new three-year contract with the teacher organization that included small salary increases and a pledge by the district to reduce class size in exchange for some concessions from the teachers in regard to health-care costs.

Soon after school opens for the year, the Principal has to leave unexpectedly due to her husband’s health problems, and the first-year Assistant Principal is appointed as Acting Principal to finish the school year.

In Let’s Improve Tanner High School teams of parents, students, teachers and other interested groups are asked to advise the Acting Principal and help navigate the school through a series of unexpected, but not unrealistic, events and opportunities. The teams are asked to draw on their own experiences and make recommendations to the Acting Principal to deal with these challenges while continuing to promote the school’s long-term goals for students.

Available Actions

Game process flow/turn order. The game is played by 3-5 teams, each made up of players from a single stakeholder group. Teams should consist of 3-6 players from the same stakeholder group (e.g., students, teachers, administrators, parents, community-based organizations, policymakers). The other teams should be comprised of players representing other groups. We expect there to be differences of opinion within the groups that have to be negotiated to develop a single response to each challenge.

The game is played in three or four rounds (depending on the number of teams and length of time available). Each round involves a new Challenge--an event or change of circumstances that affects Tanner and calls for a response from the school leadership. The teams are given a fixed amount of time to develop responses to the Challenge and based on their own experiences and insight suggest a course of action for the school. Each team presents its response, defends it, receives feedback from the other teams, and has an opportunity to refine its recommendation.
After all presentations are complete, players vote for the team with the best response. Subsequent rounds involve new Challenges.

The Game Lead supervises play, manages the Challenges, and keeps time. The Game Lead can shorten the game by eliminating rounds or extend it by adding rounds based on available time.

The order of the game is as follows:

**Getting Started**

a. Each team reviews the Description of Tanner High School, *Fast Facts* about the school, and a map of the school facilities so they understand its circumstances better.

b. Game Lead explains the procedures of the game.

**Round 1: The First Challenge**

a. The Game Lead shows the first Challenge to all teams. The challenge represents a change in circumstance that affects Tanner High School. There are five steps in each round:

b. Step 1: Responding to the Challenge

   Teams have 5-10 minutes to discuss the challenge and outline how they think the school leadership should respond. The teams should prepare a bulleted list of recommended actions that might include specific responses, additional information they might gather, alternative actions they might consider, etc. The goal is to develop recommendations that are appropriate, feasible, well-reasoned, and likely to be effective.

c. Step 2: Presenting the Recommendations

   Each team gets 2-3 minutes to present their recommendations to meet the challenge and explain the reasoning behind it. They should try to explain what information, experience or evidence they used as the basis for their recommendations. For the purpose of the game, the school will have to operate with the same annual budget that Tanner has at present. Thus, teams should try to make recommendations that are “budget neutral,” i.e., current employees can be asked to use their time in different ways, but if personnel or programs are added, then the team should identify personnel or programs to be eliminated. The order of the presentation should be random unless otherwise specified by the Challenge card.

d. Step 3: Entering the Spotlight

   After all teams have presented, each team’s recommendations are put under the “Spotlight.”

   i. The Game Lead presents the Spotlight question— a practical question about the team’s recommended course of action. All teams respond to the same Spotlight question.

   ii. Each team has 5 minutes to discuss their response to the Spotlight question.
iii. Each team presents to the group by recapping their recommendation and describing how they will address the question. The presentation order is random (or otherwise determined by the Game Lead).

iv. After each team’s presentation, other teams are allowed to ask further questions of the presenting team. Teams should take note of these questions and try to address them as they refine their recommendations.

e. Step 4: Refining the Recommendations
   i. Each team has a final opportunity to refine their recommendations based on the questions and comments during the Spotlight Step.
   ii. Each team is given 2-3 minutes to discuss and decide on final changes to the recommendations developed throughout the previous rounds.
   iii. Each team will make a brief presentation of their final recommendations, highlighting the changes they have made in response to questions from other teams or the other teams’ plans. The presentation order is random (or otherwise determined by the Game Lead).

f. Step 5: Voting on the Recommendations
   i. Each player has two votes to give to teams that they believe presented recommendations most likely to succeed.
   ii. Each player makes their votes on the recommended course of action.
   iii. This marks the end of the round. Teams are given a five minute break, and the next round begins after the break.

Round 2: The Second Challenge
The second Challenge is presented, and the five steps are repeated.

Round 3: The Third Challenge (optional depending on time)
The third Challenge is presented, and the five steps are repeated.

Ending the Game
The Game Lead ends the game after two or three rounds depending on the available time.

Adjudication Model

This is a team-based game, and the teams’ responses are judged at the end by all the other players. In Step 5 of each round each player has two votes to give to teams that they believe presented recommendations most likely to succeed. (Players may not vote for their own team.) During our pilots each player was given two chips, at the end of each round, all players walked around and gave one or two chips to the team(s) they thought had the best response. In Pittsburgh, each team had different color chips so it was possible to see the distribution of votes from one group compared to another, but there was too much variation to note any patterns. Chips were used so that voting was effectively anonymous.

At the end of the evening, we asked each team to count their chips, and the chip totals were reported aloud. This provided feedback to all teams about the attractiveness of their recommendations to the other players. The teams received more immediate feedback during the rounds in the form of questions and reactions to their proposed solutions.
Let’s Improve Tanner High School is played by teams of 3-5 people, each representing a different education stakeholder group, including (depending on the setting and audience), teachers, parents, administrators, students, business leaders, and community members. The game requires mostly printed materials, but in our pilots we also used slides to help identify the stages of play and tokens for voting on the best responses. Copies of all materials are presented in the Appendices, as follows:

Appendix A: Background Materials for Participants
Appendix B: Rules of the Game
Appendix C: Fast Facts about Tanner High School
Appendix D: Map of Tanner High School
Appendix E: Challenge Cards (as originally designed, not used in pilots)
Appendix F: Spotlight Cards (as originally designed, not used in pilots) In earlier drafts of the game we had separate cards called Implementation cards and Operation cards, but we combined these two ideas into one set of Spotlight questions.)
Appendix G: Presentation Slides
5. Pilot Testing

We conducted two pilot tests of “Let’s Improve Tanner High School.” For both tests we pre-selected three challenges and the associated spotlight questions rather than picking the challenge and spotlight cards at random during game play. The challenges and corresponding spotlight questions we presented were:

Challenge 1: Funding Cuts
The legislature cuts funding to schools statewide, requiring a 5% reduction in expenditures retroactive to this academic year. The district absorbs some of the loss, but like all schools in the district, Tanner must reduce its budget by 4%. This is roughly equivalent to four full-time teachers or seven administrative support staff. It is difficult to find outside funds (e.g., foundations, community organizations) to make up the deficit since all schools in the state are facing cuts and many are looking for other sources of income.

Spotlight Questions:
- How does the plan of action maintain or improve the engagement of students?
- What conditions are likely to present the greatest obstacle to success of your plan (e.g., inadequate funds or facilities, district or state policies that conflict with the proposed approach), and what will you do to overcome them?

Challenge 2: A Walk-out
Students walk out in protest over perceived racially insensitive remarks from a teacher. The district opens a formal investigation, which will include a thorough review of the accusation. But, at this point, the investigation is still ongoing, so it is not yet clear what was or was not said. However, a number of students continue to boycott classes in response to the incident. Both the school board and teacher organization have issued statements denouncing racism, but tensions at Tanner remain high.

Spotlight Questions:
- How does the plan of action support the goal of helping all students meet state standards?
- What is the basis in experience or other justification for the plan of action?

Challenge 3: College-Going Rates Are Slipping
The annual college-going report finds that fewer Tanner graduates enrolled in post-secondary education last year than in the two previous years.

Spotlight Questions:
- How will you know whether your actions are working or not?
- How long will take for your actions to work, and what do you expect to see happening in terms of reactions and outcomes after one month, one semester, one year?
The key lessons we learned from the two pilot tests are described below.

RAND Researcher Pilot

We played the game with a total of 24 RAND researchers in RAND’s Washington DC office on the afternoon of July 27th, 2018. The pilot test with the RAND researchers reassured us that game could be engaging enough to hold the players attention and interest for the duration of the game (3 hours), or even longer, and that the structure and content of game were mostly functional. This pilot was most helpful in learning how well proposed scenarios worked as prompts for discussion, whether game materials provided sufficient context and information, what aspects of the game play needed to be fine-tuned, and how long each element of the game took to complete. We were able to modify the game to address the issues of game play and narrative that surfaced during the pilot. We discuss two main lessons learned below.

Game Materials

If the game provides too much information for players to sift through (e.g., reams of school and district budget spreadsheets), the details become impractical and take away from the discussion of the game that surface stakeholders’ thinking; but if the game provides too little information, the uncertainty and lack of parameters either slow down the game or impair the conversation between stakeholders who decide to make different key assumptions. The pilot revealed that the previous version of game needed a little more information. Based on our observation, we updated the narrative to include a more comprehensive but simplified school budget, additional school performance measures, information about the urbanicity of the school, the characteristics of the neighborhood, the availability of social capital and infrastructure in the area, and the relationship between the district and the teachers’ union.

Group Configuration and Interactions

We debated whether we should run the game with homogenous groups where each group consists of only one type of stakeholder (e.g., all the teachers end up in the teacher team) or with heterogenous groups where each group consists of one stakeholder of every type (e.g., one teacher, one parent, one school leader, etc. make up each team). In which format would the information about stakeholders’ values and priorities most effectively emerge? During the pilot, we ran two rounds with homogenous groups and one last round with heterogenous groups. In the last round, the tension of the game unraveled and we could not track each stakeholder groups’ views. We abandoned the idea of having heterogenous groups for the purposes of this game.

We collected feedback from the players of this pilot, and they indicated that they wanted more opportunities to interact with the other teams. In particular, they wanted to be able to respond to the larger group about the fair or unfair questions, comments, or critiques they
received on their recommendation to the game’s challenge. The game could not accommodate multiple exchanges between teams without incurring significant cost in terms of time and attention, but the frustration of not being able to clarify or adjust their position would likely incur costs in other ways. So, we added a step in the game where the teams would have the opportunity to discuss among themselves and present an organized and refined response. The final feedback to the refined recommendation would then come in the form of “votes” during the voting step at the end of each round.

**Pittsburgh Community Pilot**

The Pittsburgh Community Pilot was the first and only opportunity to play the game with community members acting in their true roles. The game was played with 22 participants total; 4 business leaders, 4 school administrators; 5 teachers; 5 community organization leaders, and 4 parents. The pilot was held in RAND’s Pittsburgh office on the evening of September 28, 2018. To thank participants for coming we offered a $100 gift card and a small physical gift (a RAND water bottle). In addition to the report authors, there were other RAND researchers present to help with notetaking and coordination. A RAND media representation and one local reporter were also present.

This pilot was most useful in helping us understand how the game functions in a “real world” situation. Similar to the RAND researcher pilot, the Pittsburgh pilot continued to the suggest that the basic structure of the game functioned well. The community participants engaged in the challenges and were eager to participate in discussion. Due to time constraints, we only included challenge 1 and 2 in the Pittsburgh pilot. We discuss four additional lessons learned below:

**Game Materials**

Similar to the RAND researcher pilot, the Pittsburgh pilot also provided useful information on the extent to which the materials provided sufficient detail for the participants to address the challenges. As described above, we edited the materials after the first pilot to provide more context and information about Tanner High and the challenges. Despite these edits, the participants in the Pittsburgh pilot echoed the RAND researchers feedback that the materials were not detailed enough. Particularly with regard to challenge 1 (“Funding Cuts”), the participants felt as if the materials were too vague, and prompted more questions about the school than provided answers. As noted above, a policy game of this nature must strike a balance between providing enough information to engage the participants in the challenge, but not too much detail as to overwhelm. It seems our game as not yet found this balance. If we field the game again, we may attempt to include additional information and detail about the challenges in the game materials. That said, some of the materials that participants requested may not be feasible or helpful if provided. For example, some participants suggest that the game materials include the school’s entire budget. While this is a logical request, given the funding cuts
challenge, it would be difficult to create a “simple” school budget, and if we were created a realistic one, we do not think the participants would be able to digest the information.

Perceived Expertise and Advantages (or Lack Thereof) Amongst Participants

At the end of the game, we gave the participants an opportunity to reflect on the game play. Some noted that they felt certain groups of stakeholders came into the game with inherent advantages and disadvantages. For example, some parents felt disadvantaged due to their lack experience managing school logistics and budgets. Business leaders also appeared to feel as if they lacked some of the necessary expertise to participate. During one challenge they effectively chose not to offer any recommendation. They instead deferred to the other groups thoughts, stating that the other stakeholders were better equipped to address the situation. And, while the school administrators did not explicitly communicate that they had more expertise than any other group, on multiple occasions they referenced drawing from direct experience very similar to the challenge situations. As an example, when responding to the student walkout challenge the school administrators noted that they had facilitated student walkouts at their schools earlier this year.

Indeed the diversity of experience and expertise across the stakeholder groups is a key feature of the game. In this way, there is no good solution to this issue, as we would not want to alter the composition of the participants such that everyone would come in with the same knowledge base. However, it may be possible to provide more explicit framing at the start of the game to assuage or get ahead of any the participants anxieties. We can note that we understand and, more importantly, celebrate the diversity of experience and knowledge among the stakeholder groups. Parents, for example, may not have the same school management experience as school administrators, but they know and understand students’ home and community context in a way no one else can. We hope that all groups will draw on their unique experiences to address each of the challenges.

Varying the Types of Challenges

Both the RAND researchers and participants in the Pittsburgh pilot reflected on the nature of the two challenges used in the game. Both were short-term tactical challenges that required a response to an immediate crisis. Related to the feelings of disadvantage expressed by the parents, these challenges may have favored groups with experience managing acute crises. In the future, the game play may benefit from the inclusion of different kinds of challenges. For example, we might develop challenges that are in response to a known, but far off occurrence, such as how to plan for an expected increase in the school’s population in the next 5-10 years. This sort of challenge would require the groups to engage in long-term planning, as opposed to only short-term crisis management. Diversifying the challenges may also yield different priorities from the groups and spark new discussion.
Diversity Within the Stakeholder Groups

The participants in the Pittsburgh pilot were recruited through personal and professional connections of RAND researchers. As such, the participants were not a representative sample of the stakeholder groups, but rather community members with some existing connection to RAND (and willingness to spend a Friday evening at RAND’s office). This recruitment process led to a lack of diversity amongst the groups, particularly in their professional affiliation. This issue was evident amongst the teachers. All of the teachers who participated taught at charter schools, and, with the exception of one individual, all of the teachers were from the same school. Because charter schools fall outside of the jurisdiction of the local public school district, the experiences of charter school teachers are much different than teachers at traditional public schools. For example, many charter school teachers are not part of the local teacher union; this was true of all of our teacher participants. We imagine the discussion at the teacher table, and their recommendations in response to the challenges, would have been different had we had a group of teachers from multiple public and charter schools. For future game play, we suggest recruiting participants with a range of different professional and personal experiences within stakeholder groups.

Heterogenous Groups

As noted above, after the RAND researcher pilot, we chose to drop the round of the game played with heterogeneous groups. However, during our reflective discussions at the conclusion of the Pittsburgh pilot, some participants noted that they would have liked the opportunity for mixing among the stakeholder groups. They felt heterogenous groups would have provided an additional learning opportunity, energized the discussion, and “leveled” the playing field (as all groups would have representation and knowledge from all stakeholder groups). If we run the game again, we will revisit this question. Perhaps the rounds of the game are best played in homogenous groups, but we can consider creating a final discussion round or session with heterogenous groups.
6. Concluding Thoughts and Next Steps

Overall, the development of Let Improve Tanner High was a success. We applied RAND’s expertise in policy game development to a content area (education); RAND education researchers had opportunity to begin developing a new set of analytic tools; and we successfully created a game that helps to reveal the differing thoughts and perspectives of community stakeholder on key education issues.

Having only piloted the game twice, we conclude this project very early on in the game’s development. While, as described above, our pilot tests confirmed that the basic structure of the game accomplishes the stated goals, there is still much work that could be done to better refine the game play. For example, we have not yet found the right balance of background information to include; we could develop new and different kinds of challenges; there may different ways of organizing game play to facilitate more inter-group interaction. We must now decide whether, and if so how, to go about making these refinements.

As of the completion of this internal note, we have begun plans to play the game again as part of an event organized by the RAND Development Office. This event will likely look similar to the Pittsburgh pilot, as the game will be played with the public in a southern California community. We do not intend to make major changes to the game prior to this event. Beyond this event, the future of Lets Improve Tanner High is unclear. Possible next steps include pursuing funding opportunities to provide the time and resources for RAND researchers to continue to refine the game. In doing so, we could explore using the game as a data collection tool to gather information on the perspectives, values and preferences of various education stakeholders. Broader use of the game could contribute our understanding of stakeholder perspectives and build our insight into current education policy issues. As an additional option, Let’s Improve Tanner High School could be further developed as an offering or service that RAND Education and Labor could provide to interested communities. Rather than a data collection tool, RAND researchers could run the game in localities interested in creating an opportunity for stakeholders to engage in discussion around education issues facing their community. These are just two examples of possible next steps. We hope the processes, materials and lessons learned described in this note provide a starting place for whatever activities come next for Let’s Improve Tanner High School and/other education policy games RAND may pursue in the future.
Appendix A: Background Materials for Participants

[As played with stakeholders in Pittsburgh on September 30 2018]
Let’s Improve Tanner High School: An Education Policy Game
September 28, 2018

Why Policy Games? The RAND Corporation has a long history of using gaming to improve decision making throughout the policy arena. Gaming allows players to explore challenges, plans of actions, and possible outcomes in an invented environment that changes as the players interact. RAND started using gaming in the 1950s, and we have developed games to explore potential changes in military operations, national health insurance regulation, urban planning, climate change, drug policy, and disaster response.

Games can be used at various points in the decision making process. At the outset, games can help to make sense of poorly understood problems and identify hypotheses to be tested. Gaming can also be used for experimentation -- to test concepts and plans, and more generally to explore problems. Finally, games can be used to assess whether policy choices will result in the outcomes expected or desired by decisionmakers.

What Is a Policy Game? RAND’s Center on Gaming defines the policy game as an interactive process with five basic characteristics: (1) multiple independent decision-makers, who (2) compete to achieve goals, (3) in evolving contexts that change according to their interactions; (4) which are governed by a set of rules; and (5) the results of the interactions do not directly impact on the state of the world.

The Motivation for Let’s Improve Tanner High School. This project is an effort to develop a game that addresses an issue of current importance to education policy and judge its value as a decision making tool. Let’s Improve Tanner High School is a game focused on a struggling school and the challenges it faces. We believe that playing RAND’s newest game will benefit three groups of education policy stakeholders:

Researchers: Education policy researchers can gain insight into the preferences, motives, and beliefs of different education stakeholders, including students, teachers, administrators, parents, community members, community-based organizations. The game can also inform researchers about the ideas that these groups hold about how school leaders should confront the challenges they routinely face as state, district and local conditions change.

Participants: Games offer players a dynamic, first-hand experience of real-life problems and thus are powerful tools for exploration of challenges and solutions. Game play can spark communication and collaboration among diverse education stakeholders who may not have many opportunities to have sustained, problem-focused interactions. In addition, games place people in situations and roles they might not otherwise have experienced, which may give them better insight into the challenges faced by others in the broader education community.

RAND Education: Finally, we hope that the process of developing and facilitating Let’s Improve Tanner High School with stakeholders will enhance the capacity of RAND
Education to use games to improve our analytic skills, understanding of diverse perspectives on policy, and our policy recommendations. The education sector has many stakeholders whose perspectives are relevant to policy, and there are numerous issues beyond school improvement where conflicting perspectives need to be accommodated to achieve the best outcomes.
Appendix B: Rules of the Game

[As played with stakeholder in Pittsburgh on September 30 2018]
Education Policy Game: **Let's Improve Tanner High School**  
*September 28, 2018*

**The Setting.** Xavier R. Tanner High School is a comprehensive high school in a large metropolitan area. Tanner High School opened in 1975 with a freshman class of about 400 students. A new group of 9th graders was added each year, and the founding freshman became the first Tanner graduates in 1979. By that time the school had grown to about 1,600 students in grade 9-12. In honor of its first graduates, the student body adopted a school mascot and motto. Since then, the Tanner “Tigers” have been moderately successful in athletics but have struggled in terms of academic performance. The school’s motto, “Strive!” sometimes rings hollow when you look at student performance, and Tanner is not close to meeting its goal of preparing all students to meet state standards and graduate prepared for college and careers. In 2005, the school’s athletic facilities were remodeled and some classrooms were upgraded with cabling for computers, but very few computers were added. **Fast Facts** about Tanner High School describes the students, staff, courses and budget. The school’s physical layout is shown in the accompanying map.

Tanner’s neighborhood is not unusual for the area, containing a mixture of residential housing, small service businesses and a few vacant storefronts. The neighborhood is served by bus lines and a branch of the metropolitan rail line. There is a two-year community college about 10 minutes away by rail, and a branch of the state university is located about 20 minutes away by car (or 30 minutes by bus).

Last year, the district negotiated a new three-year contract with the teacher organization that included small salary increases and a pledge by the district to reduce class size in exchange for some concessions from the teachers in regard to health-care costs.

Soon after school opens for the year, the Principal has to leave unexpectedly due to her husband’s health problems, and the first-year Assistant Principal is appointed as Acting Principal to finish the school year.

In **Let’s Improve Tanner High School** teams of parents, students, teachers and other interested groups are asked to advise the Acting Principal and help navigate the school through a series of unexpected, but not unrealistic, events and opportunities. The teams are asked to draw on their own experiences and make recommendations to the Acting Principal to deal with these challenges while continuing to promote the school’s long-term goals for students.

**Rules of the Game.** The game is played by three or four teams, each made up of players from a single stakeholder group. The game is played in three or four rounds (depending on the number of teams and length of time available). Each round involves a new Challenge—an event or change of circumstances that affects Tanner and calls for a response from the school leadership. The teams are given a fixed amount of time to develop responses to the
Challenge and based on their own experiences and insight suggest a course of action for the school. Each team presents its response, defends it, receives feedback from the other teams, and has an opportunity to refine its recommendation. After all presentations are complete, players vote for the team with the best response. Subsequent rounds involve new Challenges.

The Game Lead supervises play, manages the Challenges, and keeps time. The Game Lead can shorten the game by eliminating rounds or extend it by adding rounds based on available time.

**Forming Teams:** Teams should consist of 3-6 players from the same stakeholder group (e.g., students, teachers, administrators, parents, community-based organizations, policymakers). The other teams should be comprised of players representing other groups. We expect there to be differences of opinion within the groups that have to be negotiated to develop single response to each challenge.

**Playing the Game:**

**Getting Started**
- Each team reviews the Description of Tanner High School, *Fast Facts* about the school, and a map of the school facilities so they understand its circumstances better.
- Game Lead explains the procedures of the game.

**Round 1: The First Challenge**
- The Game Lead shows the first Challenge it to all teams. The challenge represents a change in circumstance that affects Tanner High School. There are five steps in each round:
- Step 1: Responding to the Challenge
  - Teams have 5-10 minutes to discuss the challenge and outline how they think the school leadership should respond. The teams should prepare a bulleted list of recommended actions that might include specific responses, additional information they might gather, alternative actions they might consider, etc. The goal is to develop recommendations that are appropriate, feasible, well-reasoned, and likely to be effective.
- Step 2: Presenting the Recommendations
  - Each team gets 2-3 minutes to present their recommendations to meet the challenge and explains the reasoning behind it. They should try to explain what information, experience or evidence they used as the basis for their recommendations. For the purpose of the game, the school will have to operate with the same annual budget that Tanner has at present. Thus, teams should try to make recommendations that are "budget neutral," i.e., current employees can be asked to use their time in different ways, but if personnel or programs are added, then the
team should identify personnel or programs to be eliminated. The order of the presentation should be random unless otherwise specified by the Challenge.

d. Step 3: Entering the Spotlight
After all teams have presented, each team’s recommendations are put under the “Spotlight.”

i. The Game Lead presents the Spotlight question—a practical question about the team’s recommended course of action. All teams respond to the same Spotlight question.

ii. Each team has 5 minutes to discuss their response to the Spotlight question.

iii. Each team presents to the group by recapping their recommendation and describing how they will address the question. The presentation order is random (or otherwise determined by the Game Lead).

iv. After each team’s presentation, other teams are allowed to ask further questions of the presenting team. Teams should take note of these questions and try to address them as they refine their recommendations.

e. Step 4: Refining the Recommendations

i. Each team has a final opportunity to refine their recommendations based on the questions and comments during the Spotlight Step.

ii. Each team is given 2-3 minutes to discuss and decide on final changes to the recommendations developed throughout the previous rounds.

iii. Each team will make a brief presentation of their final recommendations, highlighting the changes they have made in response to questions from other teams or the other teams’ plans. The presentation order is random (or otherwise determined by the Game Lead).

f. Step 5: Voting on the Recommendations

i. Each player has two votes to give to teams that they believe presented recommendations most likely to succeed.

ii. Each player makes a their votes on the recommended course of action.

iii. This marks the end of the round. Teams are given a five minute break, and the next round begins after the break.

Round 2: The Second Challenge
The second Challenge is presented, and the five steps are repeated.

Round 3: The Third Challenge (optional depending on time)
The third Challenge is presented, and the five steps are repeated.

Ending the Game
The Game Lead ends the game after two or three rounds depending on the available time.
Appendix C: Fast Facts about Tanner High School

[As played with stakeholder in Pittsburgh on September 30 2018]
Welcome to Xavier R. Tanner Senior High School Advisory Committee! I am pleased that you will be assisting us in the coming year as we Strive to do better and be better in helping our students succeed. I hope the information below helps inform your solutions to the challenges we must face together.

Thank you!
Ms. Delia Strickland
Acting Principal

Our Students

We are the local Western Heights neighborhood high school. Our diverse student body is representative of the general population in this area.

Student Characteristics
Socioeconomically Disadvantaged: 90.2%
English Learners: 28.9%
Students with Disabilities: 14.6%
Foster Youth: 1.2%

Table 1: Student Demographics

<table>
<thead>
<tr>
<th>Ethnic Group</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic or Latino (any race)</td>
<td>81.3</td>
</tr>
<tr>
<td>African Indian or Alaskan Native (non-Hispanic)</td>
<td>0.1</td>
</tr>
<tr>
<td>Black or African American (non-Hispanic)</td>
<td>16.3</td>
</tr>
<tr>
<td>Asian (non-Hispanic)</td>
<td>0.2</td>
</tr>
<tr>
<td>Native Hawaiian or Pacific Islander (non-Hispanic)</td>
<td>0.1</td>
</tr>
<tr>
<td>White (non-Hispanic)</td>
<td>1.7</td>
</tr>
<tr>
<td>Two or More Races (non-Hispanic)</td>
<td>0.2</td>
</tr>
</tbody>
</table>
As you can tell by our records, we have a way to go in helping our students succeed and meet the state’s expectations.

- **Graduation Rate**: 82.7% (This rate is considered to be “poor” on the state accountability report card.)

- **College and Career Preparation Rate**: 44.8% (This rate is considered to be “medium” on the state accountability report card.) Also see Figure 1 below.

- **Student Suspension Rate**: 0.9% (This rate is considered to be “poor” on the state accountability report card.)

- **Student Achievement According to State Standards**: See Table 2, below

*Figure 1: Early Assessment Program College Readiness, Grade 12*

*Table 2: Student Achievement*

<table>
<thead>
<tr>
<th>Subject</th>
<th>% of Students Meeting or Exceeding State Expectations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tanner High</td>
</tr>
<tr>
<td>English Language Arts</td>
<td>33</td>
</tr>
<tr>
<td>Mathematics</td>
<td>10</td>
</tr>
</tbody>
</table>
Student Performance, cont’d

Figure 2: College Attendance

Percentage of 4-year cohort attending at least 1 year of college

<table>
<thead>
<tr>
<th></th>
<th>School</th>
<th>District</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>38</td>
<td>38</td>
<td>36</td>
</tr>
<tr>
<td>2014</td>
<td>36</td>
<td>42</td>
<td>40</td>
</tr>
<tr>
<td>2015</td>
<td>41</td>
<td>45</td>
<td>44</td>
</tr>
</tbody>
</table>

Staff Snapshot

Certified Staff
- With full credentials: 63
- Without full credentials: 10
- Teaching outside subject area of competence (with full credentials): 7
- Average experience (school): 5.4 years
- Average experience (district): 7.0 years
- Average teacher salary (school): $66,126
- Average teacher salary (district): $73,658

Academic Counselors: 6
Librarian: 1
Psychologist: 0.5
Social Workers: 2
Nurse: 1

Classified Staff
- Paraprofessionals: 35
- Office/Clerical Staff: 8
- Other: 17
### Staff Snapshot, cont’d

#### Table 3: Teacher Demographics

<table>
<thead>
<tr>
<th>Ethnic Group</th>
<th>School Percentage</th>
<th>District Percentage</th>
<th>State Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic or Latino (any race)</td>
<td>29</td>
<td>39</td>
<td>20</td>
</tr>
<tr>
<td>African Indian or Alaskan Native (non-Hispanic)</td>
<td>1</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Black or African American (non-Hispanic)</td>
<td>20</td>
<td>13</td>
<td>5</td>
</tr>
<tr>
<td>Asian (non-Hispanic)</td>
<td>17</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Native Hawaiian or Pacific Islander (non-Hispanic)</td>
<td>0</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>White (non-Hispanic)</td>
<td>30</td>
<td>35</td>
<td>63</td>
</tr>
<tr>
<td>Two or More Races (non-Hispanic)</td>
<td>1</td>
<td>&lt;1</td>
<td>&lt;1</td>
</tr>
<tr>
<td>No Response</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
</tbody>
</table>

### Course of Study

Tanner offers a full academic program with reduced class sizes in English Language Arts to meet the needs of the students with limited English proficiency.

#### Table 4: Course of Study

<table>
<thead>
<tr>
<th>Subject</th>
<th>Number of Classes</th>
<th>Total Enrollment</th>
<th>Average Class Size</th>
<th>Number of Teachers (FTE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Art</td>
<td>6</td>
<td>266</td>
<td>44.3</td>
<td>1.0</td>
</tr>
<tr>
<td>Business and Finance</td>
<td>9</td>
<td>267</td>
<td>29.7</td>
<td>1.3</td>
</tr>
<tr>
<td>English Language Arts</td>
<td>103</td>
<td>2,136</td>
<td>20.7</td>
<td>17.7</td>
</tr>
<tr>
<td>Foreign Languages</td>
<td>34</td>
<td>1,171</td>
<td>34.4</td>
<td>5.9</td>
</tr>
<tr>
<td>Health Education</td>
<td>5</td>
<td>221</td>
<td>44.2</td>
<td>0.8</td>
</tr>
<tr>
<td>Health Science and Medical Technology</td>
<td>7</td>
<td>285</td>
<td>40.7</td>
<td>1.0</td>
</tr>
<tr>
<td>History/Social Science</td>
<td>65</td>
<td>1,801</td>
<td>27.7</td>
<td>11.0</td>
</tr>
<tr>
<td>Hospitality, Tourism and Recreation</td>
<td>7</td>
<td>227</td>
<td>32.4</td>
<td>0</td>
</tr>
<tr>
<td>Information and Communication Technologies</td>
<td>4</td>
<td>120</td>
<td>30.0</td>
<td>0.7</td>
</tr>
<tr>
<td>Marketing, Sales and Service</td>
<td>5</td>
<td>122</td>
<td>24.4</td>
<td>0.7</td>
</tr>
<tr>
<td>Mathematics</td>
<td>69</td>
<td>1,610</td>
<td>23.3</td>
<td>11.8</td>
</tr>
<tr>
<td>Music</td>
<td>12</td>
<td>491</td>
<td>40.9</td>
<td>2.0</td>
</tr>
<tr>
<td>Other Instructional Assignments</td>
<td>27</td>
<td>258</td>
<td>9.6</td>
<td>6.8</td>
</tr>
<tr>
<td>Physical Education</td>
<td>16</td>
<td>573</td>
<td>30.9</td>
<td>4.7</td>
</tr>
<tr>
<td>Science</td>
<td>64</td>
<td>1,558</td>
<td>24.3</td>
<td>11.2</td>
</tr>
<tr>
<td>Special Subjects</td>
<td>15</td>
<td>541</td>
<td>34.6</td>
<td>2.0</td>
</tr>
<tr>
<td>Work Experience</td>
<td>1</td>
<td>1</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Multiple Subject Classes</td>
<td>4</td>
<td>46</td>
<td>11.5</td>
<td></td>
</tr>
</tbody>
</table>

The school also offers five different Advanced Placement courses (see Advanced Placement courses), and about 22% of students take at least one AP course.
The school also offers five different Advanced Placement courses (see Advanced Placement courses), and about 22% of students take at least one AP course.

Last year below half (42%) of the students who enrolled and took examinations received a score of 3 or higher, which would earn credit at most colleges.

Table 5: Advanced Placement Courses (Included in Table 4, Course of Study)

<table>
<thead>
<tr>
<th>Subject</th>
<th>Number of Classes</th>
<th>Total Enrollment</th>
<th>Average Class Size</th>
<th>Number of Teachers (FTE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Language Arts (Language and Composition)</td>
<td>8</td>
<td>214</td>
<td>26.7</td>
<td>1.3</td>
</tr>
<tr>
<td>Foreign Language (Spanish, French)</td>
<td>4</td>
<td>128</td>
<td>32.0</td>
<td>1.0</td>
</tr>
<tr>
<td>History/Social Science (US History)</td>
<td>7</td>
<td>201</td>
<td>28.7</td>
<td>1.2</td>
</tr>
<tr>
<td>Mathematics (Calculus AB)</td>
<td>1</td>
<td>31</td>
<td>31.0</td>
<td>0.2</td>
</tr>
<tr>
<td>Science (Biology)</td>
<td>2</td>
<td>77</td>
<td>38.5</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Our budget for 2016-17 was about $15 million. Of this, about $10 million could be used for general educational services and about $5 million was restricted to specific uses (such as Special Education services, and reduced class size). The general budget breakdown is shown in Table 6.

Table 6. Tanner HS Budget Overview 2016-17 (Dollars) (Form Vt-3)

<table>
<thead>
<tr>
<th>Category</th>
<th>General Fund Unrestricted</th>
<th>General Fund Restricted</th>
<th>Specially Funded</th>
<th>Cafeteria</th>
<th>Total</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personnel</td>
<td>8,025,414</td>
<td>2,439,002</td>
<td>1,109,380</td>
<td>489,331</td>
<td>12,063,127</td>
<td>81%</td>
</tr>
<tr>
<td>Other Salary Items</td>
<td>1,002,865</td>
<td>275,932</td>
<td>282,102</td>
<td>0</td>
<td>1,560,899</td>
<td>10%</td>
</tr>
<tr>
<td>Materials &amp; Supplies</td>
<td>585,103</td>
<td>51</td>
<td>144,387</td>
<td>0</td>
<td>729,541</td>
<td>5%</td>
</tr>
<tr>
<td>Equipment</td>
<td>88,454</td>
<td>0</td>
<td>75,228</td>
<td>0</td>
<td>163,682</td>
<td>1%</td>
</tr>
<tr>
<td>Travel and Conferences</td>
<td>19,910</td>
<td>0</td>
<td>7,250</td>
<td>0</td>
<td>27,160</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Dues and Memberships</td>
<td>0</td>
<td>0</td>
<td>2,700</td>
<td>0</td>
<td>2,700</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>Professional Services</td>
<td>363,125</td>
<td>0</td>
<td>19,554</td>
<td>0</td>
<td>382,679</td>
<td>2.5%</td>
</tr>
<tr>
<td>Total</td>
<td>10,084,871</td>
<td>2,714,985</td>
<td>1,640,601</td>
<td>489,331</td>
<td>14,929,788</td>
<td>100%</td>
</tr>
</tbody>
</table>
Appendix D: Map of Tanner High School
Appendix E: Challenge Cards

[Not used in pilot test; challenges preselected by game designers from these options]
A group of parents complain that the school does not offer enough AP classes. They threaten to transfer their children to another school next year.

A suspicious fire occurs overnight in a storage room. Firefighters limit damage, but science supplies are destroyed and school is closed for a day. There are rumors that the fire was set by a student but no proof.

Legislation cuts school funding, requiring a 5% expenditure reduction retroactive to this academic year. Tanner must reduce its budget 4%. This is roughly equivalent to four full-time teachers or seven administrative support staff.
The annual college-going report finds that fewer Tanner graduates enrolled in post-secondary education last year than in the two previous years.

The district has funds to expand career and technical education. Tanner is in line to receive 1 industry-focused sequence of courses. The school must make a case for receiving the program and identify an industry/career focus.

Students walk out in protest over perceived racially insensitive remarks from a history teacher, and it is hard to confirm what was or was not said.
The state adopts new technology literacy requirement for graduation.

Tanner, like all schools, has 3 years to offer all students a one-semester course or alternative.
Appendix F: Spotlight Cards (referred to as Implementation cards and Operation cards in earlier drafts of game)

[Not used in pilot test; spotlight questions preselected by game designers from these options]
How will you get current staff, students and parents to support your proposed actions?

How long will take for your actions to work, and what do you expect to see happening in terms of reactions and outcomes after one month, one semester, one year?

How will you know whether your actions are working or not?
What conditions are likely to present the greatest obstacle to the success of your plan (e.g., inadequate funds or facilities, district or state policies that conflict with the proposed approach)?

What will you do to overcome them?

How will you sustain staff, student and community support for the actions over time?
The teacher organization objects to the new demands on teachers. How will you address their objections?

Students object to the changes. What will you do to address concerns from students?

Your plan turns out to require more resources than you have. What will you do in light of the shortfall?
Operational
Not enough attention is paid to the concerns of parents; we think they will object.

How will you address their objections?
Appendix G: Presentation Slides Used in Pittsburgh Pilot of *Let’s Improve Tanner High School*
INTERACTIVE PROCESS
• Independent decisionmakers
• Competing to achieve goals
• According to rules
• Contexts evolve based on actions
• Does not directly affect the world

DEVELOP INSIGHTS INTO COMPLEX DECISION MAKING
• Make sense of problems and identify hypotheses
• Test concepts and plans of action
• Reveal potential outcomes and unintended effects
Policy Game: Let’s Improve Tanner High School

The Setting: Tanner High School is a comprehensive high school in a large metropolitan area. For many years Tanner students have performed poorly on academic measures, and Tanner is not close to meeting its goal of preparing all students to meet state standards and graduate prepared for college or careers. Tanner’s neighborhood is not unusual for the area, containing a mixture of residential housing, small service businesses and a few vacant storefronts. The neighborhood is served by bus lines and a branch of the metropolitan rail line. There is a two-year community college about 20 minutes away by rail, and a branch of the state university is locate about 50 minutes away by car (or 30 minutes by bus).

Last year, the district negotiated a new three-year contract with the teacher organization that included small salary increases and a pledge by the district to reduce class size in exchange for some concessions from the teachers with regard to health care costs.

Soon after school opens for the year, the principal has to leave unexpectedly due to her husband’s health problems, and the first-year assistant principal is appointed as Acting Principal to finish the school year. In Let’s Improve Tanner High School teams of parents, students, teachers and other interested groups are asked to advise the Acting Principal and help navigate the school through a series of unexpected, but not unrealistic, events and opportunities. The teams are asked to draw on their own experiences and make recommendations to the Acting Principal to deal with these challenges while continuing to promote the school’s long-term goals for students.

Overview of the Game: The game is played by three or four teams, each made up of players from a single stakeholder group. The game is played in three or four rounds (depending on the number of teams and length of time available). Each round involves a new Challenge—an event or change of circumstances that affects Tanner and calls for a response from the school leadership. The teams are given a fixed amount of time to develop responses to the Challenge and based on their own experiences and insight suggest a course of action for the school. Each team presents its response, defends it, receives feedback from the other teams, and has an opportunity to refine its recommendation. After all presentations are complete, players vote for the team with the best response. Subsequent rounds involve new Challenges.

The Game Lead supervises play, manages the Challenges, and keeps time. The Game Lead can shorten the game by eliminating rounds or extend it by adding rounds based on available time.
Responding to the Challenge

Presenting the Recommendation

Entering the Spotlight

Refining the Recommendation

Voting on the Recommendation

Game Play
(2-3 rounds)
<table>
<thead>
<tr>
<th><strong>Responding to the Challenge</strong></th>
<th>5-10 minutes to discuss the challenge and outline how you think the school leadership should respond.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Presenting the Recommendation</strong></td>
<td>Each team gets 2-3 minutes to present their recommendations to meet the challenge and explains the reasoning behind it.</td>
</tr>
<tr>
<td><strong>Entering the Spotlight</strong></td>
<td>Game lead asks a practical follow-up question (5 minutes to discuss response) Each team presents response; other teams ask further questions</td>
</tr>
<tr>
<td><strong>Refining the Recommendation</strong></td>
<td>Teams get 2-3 minutes to refine recommendations Each team presents final recommendations, highlights any changes</td>
</tr>
<tr>
<td><strong>Voting on the Recommendation</strong></td>
<td>Each player has two votes to give to teams that they believe presented recommendations most likely to succeed</td>
</tr>
</tbody>
</table>
Round 1
CHALLENGE 1: FUNDING CUTS

The legislature cuts funding to schools statewide, requiring a 5% reduction in expenditures retroactive to this academic year. The district absorbs some of the loss, but like all schools in the district, Tanner must reduce its budget by 4%. This is roughly equivalent to four full-time teachers or seven administrative support staff. It is difficult to find outside funds (e.g., foundations, community organizations) to make up the deficit since all schools in the state are facing cuts and many are looking for other sources of income.
What conditions are likely to present the greatest obstacle to the success of your plan (e.g., inadequate facilities, district or state policies that conflict with the proposed approach), and what will you do to overcome them?

In the Spotlight
Additional Spotlight Question: How does the plan of action maintain or improve the engagement of students?
Refining the Recommendation
Voting on the Recommendation
Round 2
CHALLENGE 2: A WALK OUT

Students walk out in protest over perceived *racially insensitive remarks* from a teacher. The district opens a formal investigation, which will include a thorough review of the accusation. But, at this point, the investigation is still ongoing, so it is not yet clear what was or was not said. However, a number of students continue to boycott classes in response to the incident. Both the school board and teacher organization have issued statements denouncing racism, but tensions at Tanner remain high.
Presenting the Recommendation
What is the basis in experience or other justification for the plan of action?

In the Spotlight
Alternate Spotlight Question: How does the plan of action support the goal of helping all students meet state standards?
Refining the Recommendation
Voting on the Recommendation
Round 3
CHALLENGE 3: COLLEGE-GOING RATES ARE DECLINING

The annual college-going report finds that fewer Tanner graduates enrolled in post-secondary education last year than in the two previous years.
Presenting the Recommendation
How long will it take for your actions to work, and what do you expect to see happening in terms of reactions and outcomes after one month, one semester, one year?

In the Spotlight
Alternate Spotlight Question: How will you know whether your actions are working or not?
Refining the Recommendation
Voting on the Recommendation
Thank You