

Junior Achievement Titan Program

2007 Program Evaluation

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Background

Introduction to JA Worldwide

Junior Achievement (JA) Worldwide has provided services to over 87 million students since 1919. According to JA Worldwide, it is the world’s largest organization dedicated to educating students about work readiness, entrepreneurship and financial literacy through experiential, hands-on programs. Through age-appropriate curricula, JA programs begin at the elementary school level and continue through the middle grades and high school. For the 2006-07 program

JA Programs	
<i>Elementary School</i>	
<ul style="list-style-type: none"> • Ourselves • Our Families • Our Community • Our City • Our Region 	<ul style="list-style-type: none"> • Our Nation • JA Dollars and Sense Biz Kid\$ • JA BizTown
<i>Middle School</i>	
<ul style="list-style-type: none"> • JA Economics for Success • JA America Works • JA Global Marketplace 	<ul style="list-style-type: none"> • JA Job Shadow • JA Finance Park • JA It’s My Business • JA Biz Kid\$
<i>High School</i>	
<ul style="list-style-type: none"> • JA Banks in Action • JA Business Ethics • JA Careers with a Purpose • JA Company Program • JA Economics • <i>JA Titan</i> • Junior Achievement Presents: The NEFE High School Financial Planning Program 	<ul style="list-style-type: none"> • JA Success Skills • JA Job Shadow • FOME* • GLOBE* • MMBiz: My Money Business* • Travel & Tourism** • YE Cambridge University Exam • Hewlett-Packard Global Business Challenge**
<p><small>* These programs are available for an international audience only.</small></p> <p><small>**These programs were developed for an international audience, but may also be available through JA offices in the U.S.</small></p>	

year, JA programs reached over 8 million students in over 330,000 classrooms worldwide. This level of program implementation was made possible through donations and support from numerous corporate and foundation contributors.

The purpose of JA programs is to inspire and prepare young people to succeed in the global economy. JA Worldwide programs are guided by the following core values:

- Belief in the boundless potential of young people
- Commitment to the principles of market-based economics and entrepreneurship
- Passion for what we do and honesty, integrity, and excellence in how we do it
- Respect for the talents, creativity, perspectives, and backgrounds of all individuals
- Belief in the power of partnership and collaboration
- Conviction in the educational and motivational impact of relevant, hands-on learning

JA programs help prepare young people for the real world by showing them how to generate wealth and effectively manage it, how to create jobs which make their communities more robust, and how to apply entrepreneurial thinking to the workplace. Students put these lessons into action, and help strengthen their communities

According to JA Worldwide, the key to the success of JA programs is the utilization of volunteer instructors. JA's 287,000 classroom volunteers are recruited via partnerships with a wide array of organizations, as well as among individual professionals, alumni, students, and parents interested in sharing their experiences with the youth of their community. Volunteers serve as course instructors and mentors and receive training from JA staff, the course curriculum, and

placement in the classroom. Scheduling for volunteers is flexible and dependent upon the grade level of instruction.

Introduction to the *JA Titan* Program

The *JA Titan* program is one of seven JA high school programs that focus on real world training to help students develop the knowledge, skills and attitudes to become productive citizens and workers. The program is classroom-based and introduces students to critical economics and management decisions through the combination of traditional teacher-lead instruction and interactive, web-based, simulation. The program is implemented in schools both nationally and internationally. According to JA Worldwide staff, there are currently 47,082 students worldwide participating in the *JA Titan* program, 38,143 of them in the U.S.

The *JA Titan* program generally takes place in the classroom with existing high school students. A JA volunteer guides students through the computer simulation exercises and generally leads all program activities with the assistance of the classroom teacher and a curriculum guide. The guide contains lesson plans for seven program sessions. Each session introduces core economics concepts through various activities and computer simulation exercises. The teacher generally serves as a coach to students during the classroom activities and simulation exercises.

JA Titan introduces critical economics and management decisions with the intent of enhancing student learning in the following concepts and skills:

- **Concepts** – Business management, Capital investment, Charitable giving, Demographics, Fixed costs, Four P’s of Marketing, Law of diminishing returns, Marketing, Marketing research, Price, Product life cycle, Production, Research and development, Target marketing, Variable costs
- **Skills** – Analyzing information, Critical-thinking, Data analysis, Decision-making, Mathematical skills, Planning, Reading charts and graphs, Research, Teamwork, Working in groups

There are key learning objectives for each of the seven required program sessions. The following table lists the key learning objectives expected for each session.

Table 1. *JA Titan* sessions and key learning objectives

<p>Session One: How Much? How Many? Students explore how price and production can affect business performance.</p>	<p>Key Learning Objectives Students will be able to:</p> <ul style="list-style-type: none"> ▪ explain how product price makes an impact on profits. ▪ understand how production can affect price, sales, and profit.
<p>Session Two: How Much? How Many? The Simulation Students learn to make decisions about price and production levels using the <i>JA Titan</i> computer simulation.</p>	<p>Key Learning Objectives Students will be able to:</p> <ul style="list-style-type: none"> ▪ make informed business price and production decisions.

<p>Session Three: Cutting Edge Students design a research and development plan for their business. They also examine the impact marketing has on sales and explore marketing strategies.</p>	<p>Key Learning Objectives Students will be able to:</p> <ul style="list-style-type: none"> ▪ determine a research and development plan for their business. ▪ explain how businesses determine their target markets and conduct market research. ▪ explain how marketing affects sales. ▪ Identify key marketing strategies.
<p>Session Four: Cutting Edge – The Simulation Students learn to make decisions about research and development and marketing using the <i>JA Titan</i> computer simulation.</p>	<p>Key Learning Objectives Students will be able to:</p> <ul style="list-style-type: none"> ▪ make informed research and development and marketing decisions.
<p>Session Five: Make an Investment Students learn methods to make capital investment decisions, promote new business growth through capital investment, and why businesses choose to make charitable giving decisions.</p>	<p>Key Learning Objectives Students will be able to:</p> <ul style="list-style-type: none"> ▪ understand that different businesses use different capital investment strategies. ▪ make recommendations for capital investment based on set parameters. ▪ define charitable giving and explain why businesses make decisions to share their resources.
<p>Session Six: Make an Investment – The Simulation Students make decisions about capital investment using the <i>JA Titan</i> computer simulation. Using the online simulation, students also make decisions related to charitable giving.</p>	<p>Key Learning Objectives Students will be able to:</p> <ul style="list-style-type: none"> ▪ make business decisions by applying their knowledge to a business simulation. ▪ use what they have learned about price, production, research and development, marketing, capital investment, and charitable giving to make business decisions using the <i>JA Titan</i> computer simulation.
<p>Session Seven: <i>JA Titan</i> of Industry – The Competition Using knowledge gained from previous sessions, students compete as businesses to see which will be crowned the <i>JA Titan</i> of Industry.</p>	<p>Key Learning Objectives Students will be able to:</p> <ul style="list-style-type: none"> ▪ understand how business decisions affect business performance. ▪ react appropriately to decisions made by other businesses.

Upon completion of the seven program sessions, *JA Titan* students can compete against other teams nation-wide via the web-based simulation as individual companies selling a fictional product “the Holo-Generator™” in a highly competitive, simulated market economy. Through simulated “business quarters” companies enter decisions on price, production, marketing, capital investment, R & D, and charitable giving. The decisions made by each individual team directly impact the simulated economy and lead to the success or failure of each Holo-Generator™ company. The team that wins the competition becomes the “Captain of Industry”.

Methodology

JA Worldwide contracted with Lodestar Management/Research, Inc. in August 2007 to conduct a summative program evaluation of the *JA Titan* program in select classrooms during the Fall of 2007. The evaluation was designed to assess the extent to which the program attained desired outcomes in student knowledge, attitudes, behaviors and skills, and to obtain the reactions of diverse stakeholders (i.e., teachers, volunteers, member site staff, and students) regarding the implementation and quality of the various program elements. Further, the evaluation sought to identify specific strategies and practices for program improvement. The evaluation was conducted from August 2007 through December 2007.

Lodestar's evaluation methodology consisted of a mixed methods approach, incorporating both quantitative and qualitative methods. Quantitative and qualitative data collection and analysis for the evaluation was divided into two phases, and included the following activities:

- Review of background documents and literature
- Pre and post-student assessment
- Training session for member site staff
- Telephone interviews with staff
- Online survey with teachers, volunteers, and staff
- Focus groups with teachers, volunteers and students

Phase I

Background document and Literature review. The first phase of the evaluation entailed a review of relevant literature on the utilization of technology-based instruction and computer-enhanced learning experiences in the classroom in order to identify and refine measurable indicators of potential program impact. The indicators identified can be grouped into the following categories: attitudes/behaviors, academic skills, and workforce skills. Background documents and reports related to the *JA Titan* program were also requested and obtained from JA Worldwide. These materials assisted with the development of indicators to measure student knowledge of the core economics and business concepts presented in the *JA Titan* program.

Pre and post-student assessment. A pre and post-assessment was developed for *JA Titan* and non-*JA Titan* comparison students across participating JA member sites to assess the impact of *JA Titan* on desired student learning outcomes. In the initial pre-assessment mailing, 2010 surveys were mailed to nine participating member sites for distribution to 68 classrooms across 17 schools (Attachment I). The survey packages contained the following materials:

- Surveys for both *JA Titan* and non-*JA Titan* comparison students
- An instruction page for data collection
- A teacher cover page for completed survey packets
- An instruction page for JA Member site staff
- A cover sheet for completed survey packets

A total of 1108 completed pre-assessment surveys were returned from eight sites. In the second

mailing, approximately 1200 post-assessment surveys were mailed to the remaining eight sites.

Table 2. Student Pre and Post-Assessment Respondent Breakdown

	Number of Students Pre (n=1108)	Number of Students completed Pre/Post	Number of Participating sites (n=18)
JA Titan Participation			
<i>JA Titan</i> students	601	397	13
Non- <i>JA Titan</i> students	507	192	11
<i>Total students</i>	1,108	589	8
JA Titan Site			
Albuquerque, NM	26	0	1
Cleveland, OH	89	80	1
Grand Rapids, MI	78	64	1
Houston, TX	572	330	7
La Crosse, WI	38	31	1
Norfolk, VA	86	41	4
Orlando, FL	92	43	1
Seattle, WA	127	0	1

*Some sites only collected surveys from *JA Titan* participants, and not a comparison group

The pre and post-assessment contained components that measured student knowledge and understanding of core economic concepts, changes in key attitude and behavior outcomes, and satisfaction with various components of the *JA Titan* program. Cohen’s *d* was utilized to calculate the effect size of the change in student scores on the post-assessment. The assessment included sections that obtained information on students’ level of exposure to *JA Titan* or other JA programs, their grade-level, and ethnicity. Unique identifiers were developed for each student based on their first/last names and birthdates. Teachers were also provided a cover sheet on which to indicate the classroom site, whether the class was a *JA Titan* or comparison class, and the name of the volunteer for the *JA-Titan* classes (Attachment II). This information permitted analyses at the classroom level.

Member site staff training. A training session was held for JA Worldwide and JA member site staff via conference call to review and discuss data collection needs and procedures for the evaluation. Prior to the training session, JA staff received drafts of the pre and post-assessment instrument and accompanying instruction letters and cover pages. During the training session, the design and implementation of the pre and post-assessment was discussed and research staff responded to questions about the importance and purpose of specific activities answered. Timelines and material distribution preferences were also established.

Phase II

Member site staff interviews. The second phase of the evaluation utilized qualitative methodologies to gather information on reactions to the program’s implementation and the overall quality of program elements by key stakeholders (i.e., *JA Titan* teachers, volunteers, and staff). Four JA member sites were selected for further qualitative data collection. Lodestar selected JA member sites in coordination with JA Worldwide. The four sites selected for the additional qualitative data collection were: Cleveland (Ohio), La Crosse (Wisconsin), Houston (Texas), and Orlando (Florida).

Initial telephone interviews were conducted with JA member site staff from the four selected sites. The interviews were informal and served to obtain basic information about the program history and implementation at the respective member site. The data collected assisted with the development of the interview and focus group protocols.

Observations and focus groups. Site visits were conducted in the cities of Cleveland (Ohio), La Crosse (Wisconsin), Houston (Texas), and Orlando (Florida) at schools implementing the *JA Titan* program. Classroom observations were conducted at each school, as were interviews and focus groups with *JA Titan* teachers, volunteers, and student participants. In addition to providing context to the findings from the student pre and post-assessments, the interviews and focus groups served to draw out specific examples of the program's impact, its strengths, and recommended areas for improvement.

Online survey. An online survey was designed and conducted with 10 *JA Titan* teachers, 11 volunteers, and 7 JA member site staff (Attachment III). The online survey served to obtain corroborative measures of diverse stakeholder perceptions on the quality of program elements and their effectiveness in achieving desired student learning outcomes. The teacher and volunteer surveys also included a section for rating the difficulty level of questions on the student pre and post-assessment. This was done to account for any variability across sites in the utilization of *JA Titan* program materials that could potentially affect student performance.

Limitations to evaluation analyses. The primary limitation to this evaluation was the varying degree of implementation of pre and post assessment surveys. Specifically, there were instances where surveys were not administered and/or proper surveys were not distributed. There were a variety of reasons why this occurred with a main reason being that the time and staff resources dedicated to evaluation at each member site varied, due primarily to constraints posed by other program evaluations and program-related activities. Additional reasons why surveys were not always administered or properly administered include that there were interruptions in the regular schedule of *JA Titan* sessions due to the absence of a volunteer and some member sites withdrew from participation in the evaluation.

Efforts were also made to ensure the selection of an appropriate comparison group for *JA Titan* students at each participating school, but some member site staff were not able to obtain the cooperation of teachers and thus either had to forgo the comparison group completely or select an alternate class. Additionally, there were instruction sheets and cover sheets for each teacher specifying the procedures for survey distribution and collection for both the *JA Titan* and non-*JA Titan* classrooms, but five of the member sites had classrooms where the incorrect post-assessments were distributed to students; this limited the sample of *JA-Titan* students for the satisfaction portion of the survey, however it should not have affected the analyses of core content sections of the survey because they were the same for both *JA Titan* and non-*JA Titan* students.

Evaluation Findings

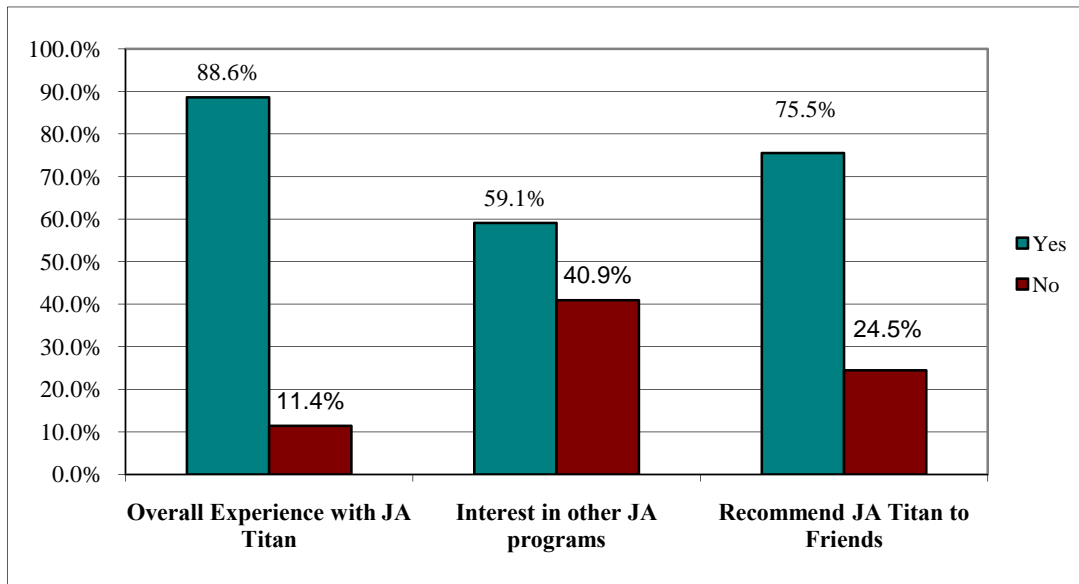
The following section contains the key findings from the evaluation conducted of the *JA Titan* program. Generally, the findings indicate that overall program satisfaction is high among teachers, volunteers, JA member site staff, and students. Perceptions of *JA Titan* program benefits are particularly high in the areas of core workforce readiness skills, such as decision-making, critical thinking, and problem solving, as well as in communication and teamwork. Further, the computer-based simulation is generally perceived to be an ideal learning tool for the cultivation and enhancement of such skills. The program is widely perceived among stakeholders and participants as effective in facilitating the understanding of business and economics concepts and increasing student engagement, particularly due to the simulation's competitive element. The majority of teachers, volunteers, JA Staff, and students also perceive that the *JA Titan* program has had a positive impact on student attitudes towards business, in particular, and economics, albeit to a lesser extent.

The results of student performance on a pre and post-assessment were mixed. Overall, across all sites there was no evidence that *JA Titan* students improved in their knowledge of key economics concepts or performed better than non-*JA Titan* students after exposure to the *JA Titan* program. However, among specific JA member sites, there were significant improvements in three of the sites and for two sites there were significantly higher scores for *JA Titan* students than non-*JA Titan* students. The mixed results on the pre and post-assessment are not surprising given the finding that program implementation varies considerably across sites, as does the extent to which the program's curriculum is utilized along with the *JA-Titan* simulation.

Overall satisfaction with the program was high among teachers, volunteers and students

Teachers perceived that the *JA Titan* simulation serves as an extra tool with which to reinforce concepts and that it allows them to address economics topics in a manner that appeals to students. In an online survey, 82% of teachers and volunteers indicated being satisfied with their *JA Titan* program experience and the same percentage indicated that they would recommend the program to others. In the post- assessment, the level of student satisfaction with the program was also high, with 88.6% of students indicating satisfaction with their overall experience in the program and 75.5% indicating that they would recommend the *JA Titan* program to friends (Figure 1). Further, in a focus group, one student emphasized the importance of the volunteer to the overall program experience, saying, "*I'm really happy with the program. We are pretty lucky to have [the volunteer], he is very knowledgeable... so he gives us a good perspective of how all it really works.*" Other students in focus groups shared this sentiment about the value of the volunteer to their learning and experience in the program.

Figure 1. Student Satisfaction with the *JA Titan* program



Source: Student surveys conducted in November and December 2007 with *JA Titan* participants

Aggregate pre and post-student assessment results were mixed; however, some JA member sites showed significant improvement

A total of 589 student pre and post-assessments were completed for an overall response rate of 53% (Attachment IV). Student pre-assessments were distributed to both *JA Titan* and non-*JA Titan* participants to establish a base-line level of knowledge of the core economics concepts presented in the *JA Titan* program. The base-line scores provided a point at which to measure the extent of knowledge gain via comparison with post-assessment results at the completion of the program. The pre-assessment scores of the two groups of students were compared statistically to detect any significant difference in knowledge at the outset of the evaluation and thus their overall comparability. No significant differences were found at the aggregate level.

“Students don’t see the connection between what they are studying in the book and the outside world in terms of economics...it [JA Titan] gives them an opportunity to make some real decisions... I think the program gets them involved.”

—Volunteer

An initial analysis of the student assessment data did not reveal that *JA Titan* students, in aggregate, improved in their knowledge of key *JA Titan* concepts from pre to post-assessment; however, breakouts by JA member site showed that some individual sites had statistically significant improvements. Specifically, the Orlando and La Crosse member sites showed significant improvement from pre to post-assessment among *JA Titan* students, while the Houston site showed a significant decrease in the scores of *JA Titan* students from pre to post-assessment. In aggregate the average score (mean score) of *JA Titan* students decreased from 59.84 to 58.96 (out of 100 possible points),¹ while the mean score for non-*JA Titan* students

¹ This was not statistically significant ($p > .05$; $n = 397$)

decreased from 64.58 to 61.46.² In Orlando the mean score for *JA-Titan* students improved, increasing from 60.27 to 69.77,³ while in La Crosse the mean score for *JA-Titan* students improved from 70.45 to 80.30.⁴ In Houston the mean score decreased from 58.37 to 52.53.⁵

Upon further analysis of the student assessments, cases were grouped into students who obtained correct scores for more than 50% of the core content questions (questions 1-12) and those who obtained correct scores for 50% and fewer. Performance on each of the 12 content questions was then analyzed by each group. The results showed that those who scored higher than 50% were significantly more likely to obtain the correct answer on each question with the exception of question 11, which asked students to match the scenario that was an example of the “law of diminishing returns.” On this question, a statistically significant higher number of students with scores above 50% answered incorrectly; the number was higher than would normally be expected by chance alone.⁶ Additionally, in an online survey with teachers and volunteers, majorities of both groups (90% and 100%, respectively) rated question 11 as a moderate to difficult question based on their knowledge of the *JA Titan* program material. Therefore, this item was removed from the analysis of student assessments and score recalculated.

Having removed question 11 from the analysis, the results showed that, in aggregate, the score of *JA-Titan* students decreased from a mean of 62.58 to 61.76,⁷ while the score for non-*JA Titan* students decreased from a mean of 67.76 to 64.16.⁸ However, breakouts by member site showed that the scores from each member site, except Houston improved from pre to post-assessment for *JA-Titan* students, while decreasing for non *JA-Titan* students. Specifically, Orlando scores increased from a mean of 62.16 to 73.57,⁹ Cleveland scores increased from a mean of 63.64 to 69.53,¹⁰ and La Crosse scores increased from a mean of 74.38 to 81.82,¹¹ while Houston scores decreased from a mean of 60.98 to 54.85.¹² Because Houston scores were the only that decreased from pre to post-assessment for *JA Titan* students, an additional analysis was conducted excluding Houston from the sample to test whether the mean score for *JA Titan* students would improve (increase in aggregate from pre to post-assessment) compared to that of non-*JA Titan* students. The results showed that upon removing Houston from the sample, the mean score for *JA Titan* students overall improved, increasing from 65.03 at pre-assessment to 72.32 at post-assessment, while that for non-*JA Titan* students decreased from 65.15 to 62.39.¹³

² This was statistically significant (p<.05).

³ This was statistically significant (p<.05).

⁴ This was statistically significant (p<.05).

⁵ This result was statistically significant (p<.05)

⁶ Pearson Chi Square results were statistically significant (p<.05)

⁷ This result was not statistically significant (p>.05).

⁸ This result was statistically significant (p<.05).

⁹ Cohen’s d was used to calculate effect size (d=-.79; a large effect size ranges between .60 and .80).

¹⁰ Cohen’s d was used to calculate effect size (d=-.33; a medium effect size ranges between .3 and .5).

¹¹ Cohen’s d was used to calculate effect size (d=-.75; a large effect size ranges between .60 and .80).

¹² All results were statistically significant (p<.05).

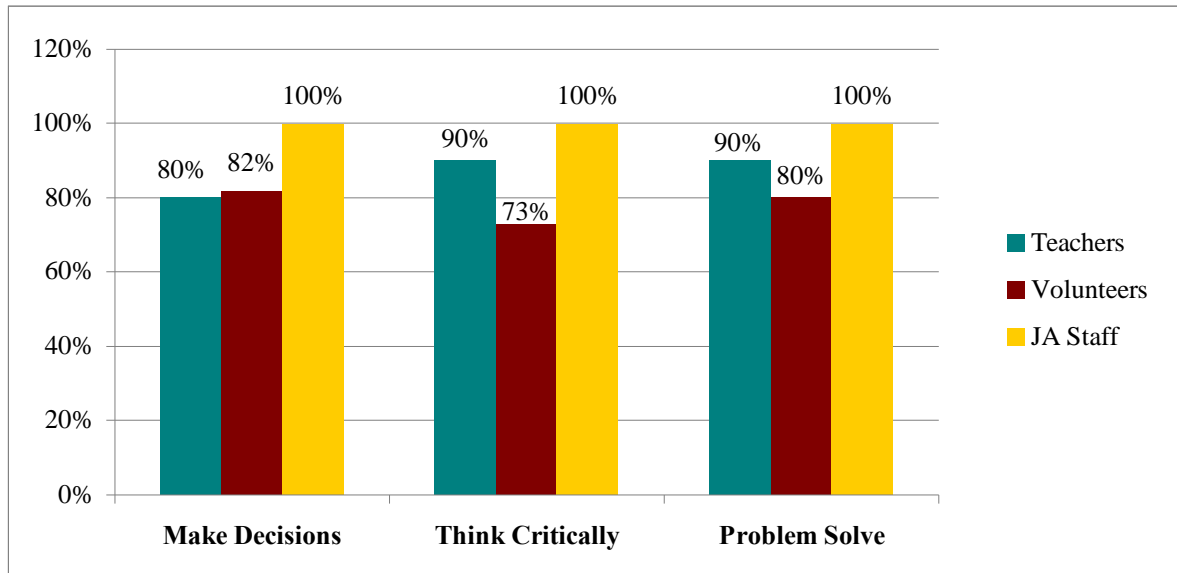
¹³ The results for the *JA-Titan* students were statistically significant (p<.05).

JA staff, teachers, volunteers, and students perceived that the JA Titan program enhances students' workforce readiness skills (i.e., decision-making, critical thinking, and problem solving)

Research has found that computer simulations can increase the skills necessary for better problem solving capabilities. Specifically, students make better decisions by focusing attention and analyzing different options in a more detailed manner (Cradler et al. 2002). Decision-making was a key aspect of the JA Titan program and all stakeholders agreed that the program had a positive impact on students' ability to make decisions. A central aspect of the JA Titan program's appeal to students was their ability to assume the role of company chief executive officers (CEO) and make company spending decisions that would impact their company's (team's) success. One student said, "We figured out what we were going to do and developed our strategy. We can learn from our mistakes in the first game and we were able to work better in future games."

In an online survey, large majorities of teachers, volunteers and staff either agreed or strongly agreed that the program improves students' ability to make decisions, think critically, and problem solve (Figure 2). Additionally, project-based learning and workforce readiness were equally ranked as the most important educational aspects of the JA Titan program by JA staff, followed by real life simulation and group activities. Volunteers and Teachers considered the real life simulation to be the most important educational aspect of the program; teachers then perceived project-based learning to be the next most important aspect, followed by both workforce readiness and group activities equally. A majority of volunteers ranked group activities both second and third in education importance.

Figure 2. Key Stakeholder Perceptions of JA Titan Impact on Core Workforce Readiness Skills



Source: Online survey conducted in October 2007 with teachers, volunteers, and JA staff

One student focus group revealed that the program had taught students that changing economic and market variables in the program can have unintended effects and that changes must be examined to anticipate all potential impacts that a change in spending or budget allocation might

have on other company characteristics. *“There are a lot of decisions that can be made and if you over look one thing it can mess you up,”* one student said.

Due to the competitive aspect of the program, student decisions had real impact in terms of their ranking against their peers. Consequently, students reported that they carefully considered the program decisions they made. *“If you make a bad decision it’s hard to recover from it,”* one student said. Because the *JA Titan* simulation is played by teams, the program facilitates team decision making and negotiation rather than students making decisions on their own. *“We had a lot of loans and owed a lot of money. Our group got together to discuss our options and how to solve the problem until we were able to find a solution,”* another student explained.

“We had a problem in deciding whether to shrink our plant or not because the economy was going down. I thought we should and other people did not, so we tried one person’s idea per quarter. We tried everything until we found a solution.”
—Student Participant

Teachers also said that the decision-making process of the program is enhanced by the timely outcomes students are able to see resulting from their decisions. Teachers expressed that the program encourages students to think of their decisions in terms of “cost and benefit” and adjust their outcomes strategies and decisions based on the decisions made by other student teams. Teachers also noted that the decision-making aspect of the program allows students to *experience* the economic theories they learn in class put them into practice in the simulation. Volunteers and JA staff agreed that the program facilitated students’ decision making process.

Teachers, volunteers, and students perceived that the *JA Titan* program cultivates and enhances communication and teamwork

Research indicates that simulations can improve valuable skills in human interactions, specifically because a simulation is a holistic process where students learn to work as a group in order to achieve a goal. The ability to work well on a team is a crucial social skill for workforce readiness (Herz & Merz, 1998; Cradler et al, 2002). In interviews, teachers often emphasized that because the game has a particular focus on team-based analysis and decisions, interpersonal relations are important for success. In an online survey, 100% of teachers, 83% of JA staff, and 64% of volunteers either agreed or strongly agreed that the *JA Titan* program increases students’ ability to work well on a team.

In interviews, teachers, volunteers, JA staff, and students were in agreement that the *JA Titan* program requires and encourages teamwork among participants. Teachers perceived that students gain a range of social skills from participation, including self-confidence, public speaking, and teamwork. Many expressed that the simulation has a particular focus on team-based analysis and decision-making, which makes interpersonal relations a key component of success. One teacher said that the simulation facilitates teamwork in fashion that could not be replicated through learning from a textbook. In another case, a teacher said that that the *JA Titan* teams have at times served as the starting point for ongoing friendships between students.

In an online survey, a majority of teachers (100%), volunteers (64%), and JA staff (83%) either agreed or strongly agreed that the simulation increases students’ ability to work well on a team.

In one classroom observation, the *JA Titan* volunteer began the session with a mini-lecture on the importance of teamwork in adult life in general and the corporate world in particular. In interviews, volunteers and teachers expressed that one of the important impacts of the program was the relationships that students develop in class. Classroom observations also revealed a high degree of teamwork among students participating in the simulation. During the observations, teams were often observed discussing economics concepts and the strategies they and their teammates were utilizing. Students also helped one another navigate the simulation menus and interpret results, and there appeared to be coordinated decision making throughout. Students themselves repeatedly indicated that the program helped foster teamwork and communication. During one session, a teacher asked a student serving as the leading team's company president to share "best practices" with other class members. The suggestions that the student shared with the rest of the class included building group solidarity and even following up with team members outside of class to review their performance.

"[Working in groups] helps a lot because you might think about something that some people might not think of and we can bounce the ideas off of each other."

—Student Participant

In focus groups, students' comments indicated that they clearly understood the importance of teamwork to success in the *JA Titan* competition. Students frequently expressed that they often conferred with their teammates before making decisions during the simulation exercises. According to one student, *"This [the simulation] made me realize...the way it [the importance of teamwork] is in real life and this class just gives us an idea about it."* Another student noted, *"Working in groups gives us different perspectives and kind of helps us think about different possibilities."* Students also confirmed that the program improved their teamwork skills, *"Yes, you learn how to deal with people that do not want to participate,"* one said. Another student stated, *"Sometimes some people dominate over others, but this is something that can happen in real life"*.

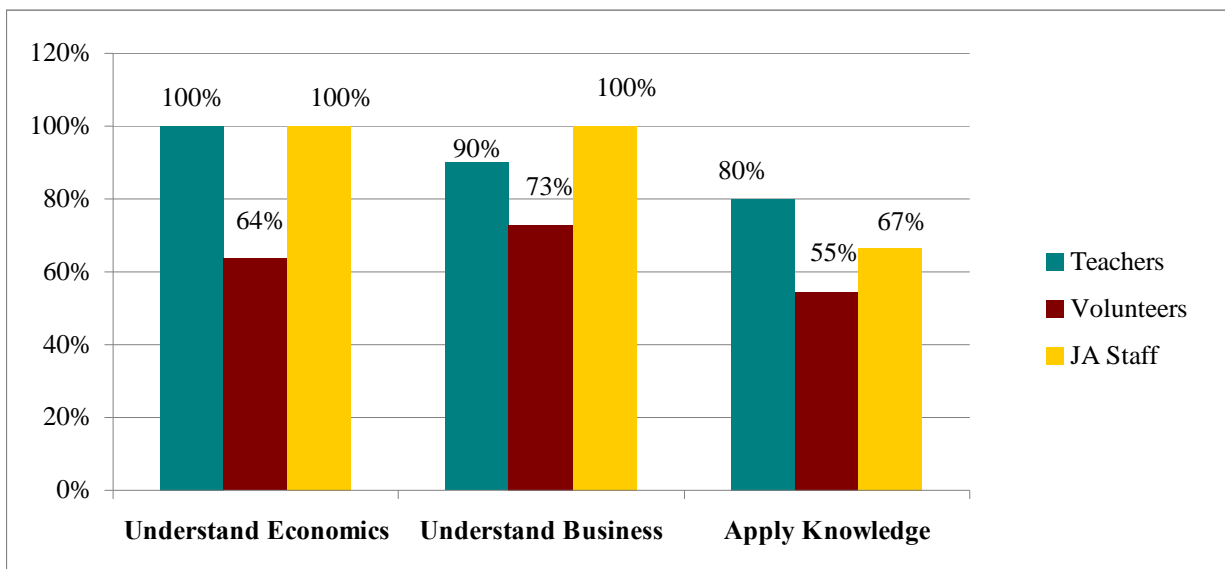
Although students generally indicated enjoying the teamwork element of the *JA Titan* program, some also explained that the simulation sessions could be challenging for team members. One student, for example, complained about not being able to depend on people and having to constantly monitor teammates. Additionally, although most students were interested in the simulation, students pointed out that it was difficult interacting with students that were not as engaged. Some students reported ignoring unmotivated team members, leaving them unengaged during the *JA Titan* sessions. Nevertheless, according to the majority of teachers, volunteers, JA staff, and students, the experience of team-based decision-making during the simulations has had a highly positive impact on most students. During classroom observations, it seemed that the only occasions on which students were not engaged were when teams had more than three team members. One teacher pointed out that he considered the ideal team size to be three students because it seemed to provide the right dynamic in team discussions, where everyone was engaged.

JA staff, teachers, and volunteers perceived that the *JA Titan* program improves students' ability to understand important economics and business concepts and apply them to the real world

Research on the use of web-based simulation programs highlights numerous advantageous elements that facilitate student performance. For example, simulations allow students to explore challenging concepts at their own pace and provide real-time outcomes based on students' decisions (Santos, 2002). Additionally, active participation in the learning process increases the likelihood that students will remember the information presented to them (Millerd & Robertson, 1987; McDonald & Hannafin, 2003). Simulations are also ideally suited to enhance the learning of complex subject matter because their structure permits students a step-like approach of focused inquiry; for example, lowering or increasing the price of an article and obtaining immediate results facilitates the understanding of concepts such as supply and demand, law of diminishing results, fixed price, etc. (Maxwell et al., 2004).

Online survey results support that the *JA Titan* program enhances student abilities in concept learning and application. The majority of teachers, volunteers, and JA staff either agreed or strongly agreed that the program improves students' ability to understand core economics and business concepts and apply their knowledge to real world scenarios (Figure 3).

Figure 3. Perceptions of *JA Titan* Impact on Learning and Application of Content Area Concepts



Source: Online survey conducted in October 2007 with teachers, volunteers, and JA staff

The findings from *JA Titan* classroom observations and focus groups with students support that concept understanding and retention were enhanced by the simulation; specifically, the activity of playing the simulation allowed students to experiment with the theories they were learning by applying them directly to the simulation which then provided immediate consequences to their actions. One student noted, for example, “*We can learn from our mistakes in the first game and we were able to work better in future games.*” Most students reported that the simulation helps them retain concepts better than traditional lecture and reading their textbooks. “When I look at a textbook I just memorize it and forget about it later on,” one student said, adding, “I remember

the game”. Students also expressed that the simulation helps them understand economics concepts more than traditional textbook learning alone. Additionally, interviews with teachers and volunteers and focus groups with students revealed that students sometimes chat informally outside of class about their experiences in the simulation, which reinforces the retention of concepts.

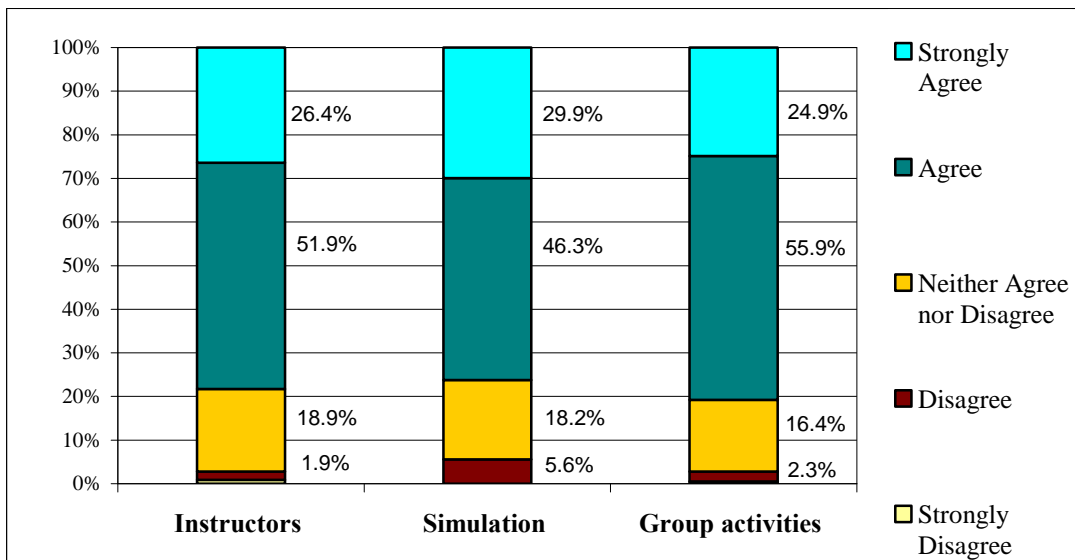
“It’s a lot easier to remember a strategy to a game than something from a textbook. I think we focus more on having fun than reading and not remembering anything. If you just read and never really use it [the information], it does not help you learn. If we learn and we play the game that helps us remember it a lot better.”

—Student Participant

In interviews with teachers, there was a perception that students tend to enroll in high school economics classes with an interest in business, but often have little knowledge of economics. Because the *JA Titan* program presents core economics concepts via examples appropriate for high school students’ skill levels, it facilitates their ability to make connections between concepts and their application in the simulated market economy. Furthermore, teachers expressed that the simulation is fun, so students are more apt to explore the concepts with their fictional company strategies. It is important to note, however, that in classroom observations the simulation sessions that seemed to be most effective were those in which the session core concepts were presented to students and examples given by the volunteer before engaging in the simulation exercise, and then constantly reinforced by both the teacher and the volunteer throughout the simulation.

In interviews, teachers and volunteers confirmed that although the simulation facilitates the connection between concept and application, it is only a learning tool; thus it is crucial to coach students, constantly reinforcing that connection. Findings from the students post-assessment support this; based on student responses, in terms of understanding core economics concepts, group activities, followed by instructors, and then the simulation were considered most important (Figure 4).

Figure 4. Student Perceptions of Most Important Elements in Understanding of Core Concepts

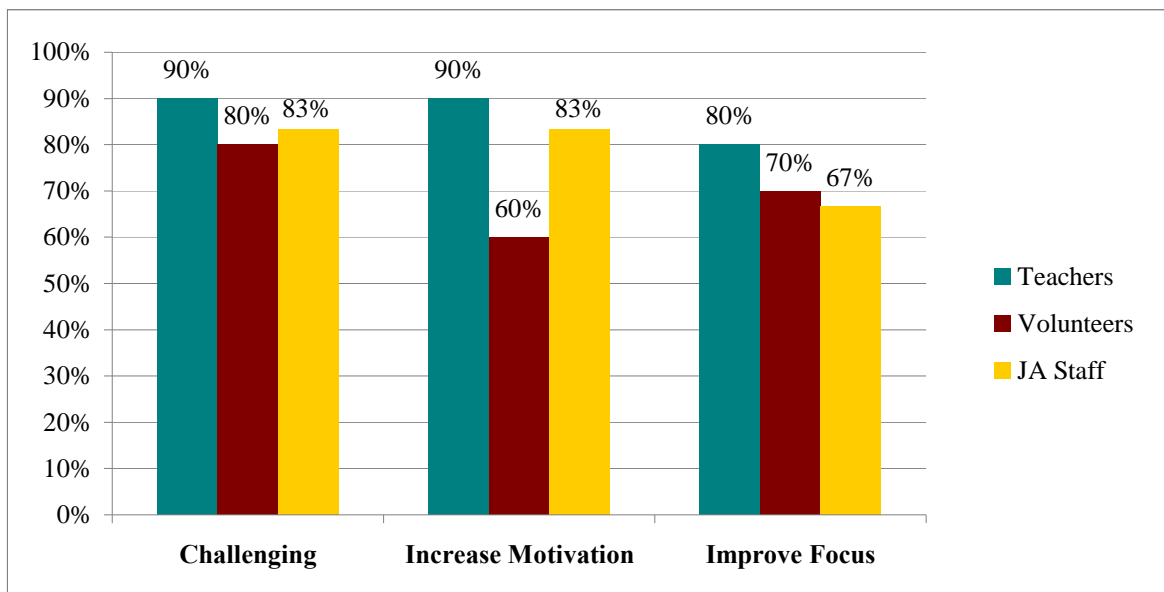


Source: Student surveys conducted in November and December 2007 with *JA Titan* participants

Teachers and volunteers perceived that the simulation generally engages students in the learning process

Research has shown that appropriate application of technology in the classroom increases students' engagement in the learning process (Fadel and Lemke, 2006). Metteri (2006), for example, discussed how multimedia can engage students visually, cognitively, emotionally, socially, and civically in academic content, but that results depend on high-quality content and sound pedagogy. Interviews with teachers and volunteers revealed perceptions that the increase in student engagement is one of the most important impacts of the *JA Titan* simulation. In an online survey a majority of teachers, volunteers, and JA Staff either agreed or strongly agreed that the simulation is challenging for students, increases motivation, and increases focus, all key elements in engagement (Figure 5).

Figure 5. Perceptions of *JA Titan* Impact on Student Engagement



Source: Online survey conducted in October 2007 with teachers, volunteers, and JA staff

Comparing the value of the simulation in enhancing student engagement to traditional textbook learning, one volunteer said, “[To explain a concept] There are only so many supply and demand charts that you can look at [in a textbook].” Another volunteer explained that some students were so interested in the simulation that they regularly sign on and play from home. This volunteer also noted that students print out the company reports and bring them into class to discuss. It is important to note that although the simulation elicited a high level of engagement from most student participants, in classroom observations the teacher and volunteer had to make concerted efforts to ensure that all students remain focused on the task at hand. The best examples of student engagement that were witnessed in classroom observations were those in which the *JA Titan* teams were small (two to three members) and both the teacher and volunteer circulated around the room coaching individual teams. It was also an effective practice to pause the simulations after a set number of quarters had elapsed to debrief with the entire class and review each team’s results before resuming the simulation.

Teachers, volunteers, JA staff, and students perceived JA Titan’s competitive element to be critical to student engagement

In interviews, teachers, volunteers, and JA staff overwhelmingly agreed that the gaming and competition elements of the simulation were the primary attractions for students and what engaged them most in the program. One teacher explained that students today enjoy and are accustomed to computer games, so the simulation is both a familiar and enjoyable medium of learning. In focus groups, students expressed that the JA Titan program was fun and that it revealed to them that there were other means of learning besides lectures and textbooks. Some students affirmed that the simulation had a definite impact on their desire to attend economics class. Some students reported that before taking their economics class, they expected it to be boring, but that the JA Titan sessions changed their attitudes.

“Some of the teams are well engaged and they’re working together and their performance in terms of the Titan outcome tends to be better...[But] there is one team that is really not engaged. There is one guy that tends to be nodding off in class. They don’t know what they are doing.”

—Volunteer

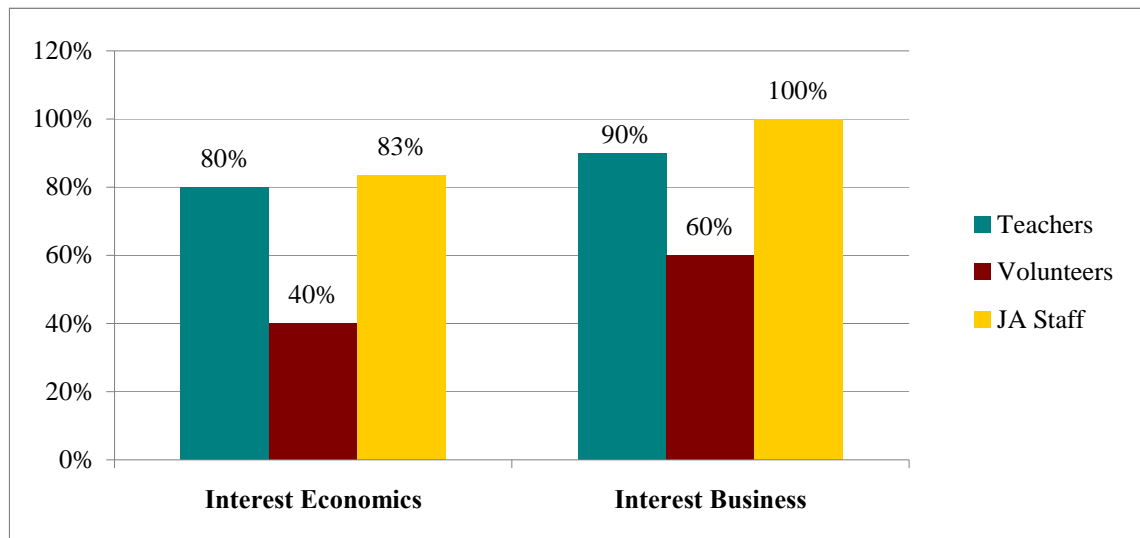
In focus groups with students, comments reinforced the appeal of the competition through the simulation. One student said, *“They make it competitive so you actually want to do good (sic).”* Students especially emphasized that the desire to be in first place among peers was a major motivation to learn more about the simulation strategies and concepts on which they were based. *“I like the competition,”* another student agreed. *“I try to learn more so that I can beat other people instead of trying to learn for myself. I like to be in first place.”* In classroom observations, the level of enjoyment that students gained from competing against each other was visible in their discussions with team-mates and in some instances, playful taunting of each other. The real-time element to the simulation seemed to add a sense of excitement for some students, while others appeared more focused and carefully monitored the results.

Students and teachers reported that the ability of students to create, name, and lead their own companies (teams) provides an authentic stake in the simulation and the outcome. In interviews, teachers and volunteers explained that the simulation requires that decisions be based on sound economic theory in order to be successful. One teacher noted, *“At first you’re doing capital investment...they don’t even want to listen,”* then added, *“But when they get into it they figure out that if they don’t understand it they can’t do as well.”* In an interview, one volunteer explained that he often plays the simulation himself with colleagues and that they try to test theories on their own. According to the volunteer, there has never been an unexpected outcome; the results always turn out as they should given the particular market scenarios. Thus, students succeed in the simulation by making sound economic decisions. In an interview, another volunteer highlighted the advantage of the competitive element of the simulation in maintaining a high level of student engagement; *“No one wants to lose to their friends,”* he said, adding, *“I don’t have a tough time keeping their attention.”* Another volunteer noted, *“I think competition between students really propels them because no one wants to be the last.”*

Teachers, JA Staff, and students perceived that *JA Titan* generally increases students' interest in business and economics and plans to pursue a business career.

Research on the benefits of technology-based instruction, such as simulations, suggests that this form of teaching can increase a student's interest in a subject matter, in addition to motivating them to learn. One study, for example found increased motivation and interest in the field of economics by students who played a simulation game against fellow classmates. Similar to *JA Titan*, the program provided students with real-time outcomes based on their decisions, as well as the decisions of other students (Santos, 2000). In an online survey, a majority of teachers, volunteers, and JA staff agreed or strongly agreed that the *JA Titan* program increases students' interest in business and a majority of teachers and JA staff agreed or strongly agreed that the program increases student interest in economics. Volunteers did not indicate a strong perception that the program increases students interest in economics, but this may be due to the micro-economics focus of the program, rather than macro-economics in general (Figure 6).

Figure 6. Perceptions of *JA Titan* Impact on Attitudes Towards Business and Economics



Source: Online survey conducted in October 2007 with teachers, volunteers, and JA staff

In interviews, teachers, volunteers, JA staff, and particularly students in focus groups, expressed that the *JA Titan* program increased some students' interest in business. Many student focus group participants reported being more interested in business due to their experiences with the program. For example, one student said that after playing the *JA Titan* simulation, he noticed how marketing was utilized in the *Halo 3* computer game as a tool to increase consumer demand for the product. Overall, students indicated that they were more attuned to real world business concepts and strategies.

Part of the increased interest in business seems to stem from increased confidence among students that they have an understanding of how a successful business runs and that they possess marketable skills that employers would desire. For example, in focus groups, some students expressed that the *JA Titan* simulation helped them to develop skills that could be

"I actually now realize that there is more to getting a business degree; for example, I know of various jobs I could get such as working for the government."
—Student Participant

used in a real world business setting. They expressed that the simulation helped them to learn what it takes to be effective in running a successful business, for example, the importance of correctly allocating limited resources based on changing market conditions. One student, for example, reported that the simulation functioned as practice for the real world. This student said that *JA Titan* participants would be more knowledgeable if they entered the business sector and would not make the same mistakes the made and learned from while playing the *JA Titan* simulation. *“I think it’s [the simulation] a trial and error kind of thing,”* the student said, adding *“Like you could learn about your mistakes so you won’t make them in the real world.”*

Teachers, volunteers, and some students perceived that even for those students that are not interested in economics, the *JA Titan* program serves as an indicator about whether or not to pursue a business or economics-oriented career, thereby clarifying their professional goals. *“I think it helps you make up your mind,”* one student said, adding, *“This program helps you know whether to continue in economics or not. People that are not interested are usually the ones that do not participate. To others, this program helps contribute to their interest in economics.”* Another student said, *“I definitely became more interested [in economics]. If you know more about something you become more interested.”*

Some students reported that the *JA Titan* program impacted their decision to pursue further studies or a career in business and economics. According to one student, for example, *“I’m probably going to go to UT [the University of Texas] and want to go into business.”* A similar sentiment was expressed by students at several sites. According to another student, *“I was planning on going into business so I decided to take this class...taking this class makes me want to go into business more than before.”* One student noted how his mind had changed about pursuing a career in business, saying, *“I actually had no plans of going into business and now I think it’s something I might want to do.”* Some students also expressed that the *JA Titan* program gave them a better idea of how they could use a business degree.

Implementation of the JA Titan program varied across sites

JA member sites allow a high degree of autonomy among teachers and volunteers in implementing the *JA Titan* program. Teachers, for example, expressed a high degree of flexibility in how the volunteers choose to structure the class, which tends to be the case when teachers and volunteers have been working together over time. According to one volunteer, *“I get to run the class according to the way I think it should go. And that’s why I like staying here because I think if I went to another school it would take more time to build that rapport.”* The fact that the implementation of the *JA Titan* program varied across sites seemed to have both positive and negative consequences. On one hand, a key element of simulation programs that makes them powerful teaching tools is that they can be customized to fit teaching styles and course objectives; on the other hand, as noted above, students tend to receive inconsistent exposure to the program curriculum. For example, one JA staff member explained that some volunteers tend to over-emphasize teaching strategies for winning the simulation giving less attention to ensuring that students fully grasp the concepts that underlie those strategies. A situation such as this could have potentially negative effects on student content area knowledge of the key concepts presented in the *JA Titan* curriculum.

Perceptions of the extent to which the core curriculum concepts of the *JA Titan* program are explained clearly and effectively were mixed among teachers, volunteers, JA staff, and students. The majority of teachers who participated in the online survey (90%) agreed or strongly that program concepts were explained clearly and effectively, as did the majority of volunteers (64%), albeit to a lesser extent. However, interviews with teachers and volunteers revealed that the concepts emphasized in the *JA Titan* curriculum were not necessarily considered relevant to teaching students how to play the simulation. In an online survey, for example, only 47% of volunteers agreed or strongly agreed that the program materials and simulation effectively complemented each other. In interviews, most volunteers expressed that the program’s “Guide for Volunteers and Teachers” was not very useful in teaching students the elements they need to succeed in the simulation. Additionally, at no time during the classroom observations was the use of either the guide or the student workbook observed. In focus groups, student perceptions of the clarity of core concepts were also mixed. According to one student, for example, “*They tell us what to do...but he doesn’t really explain why it works.*”

In order to account for the possibility of varying exposure to curriculum content among *JA Titan* students, the online surveys with teachers and volunteers included a section that allowed the respondent to rate the difficulty level of questions that were included on the student pre and post-assessments based on what was being taught in their classrooms. The results of volunteer and teacher ratings indicated mixed perceptions of the level of difficulty of content area questions and possibly about the concepts being taught in their classrooms; the majority of volunteers rated three of the seven content area questions as difficult and two as moderate, while the majority of teachers rated four of the seven questions as moderate. A possible explanation for why teachers generally tended to perceive the content area questions to be less difficult than volunteers overall, may be due to the increased time that teachers spend with students in the classroom covering material—volunteers typically visit classes between once and a few times per week.

Upon comparison of the volunteer and teacher ratings with *JA Titan* student performance on the content area section of the assessment, there did not appear to be any relationship between the two; for example, on only one question (question 7—the information that a business should be prepared to present to potential investors), did a clear majority (55%) of volunteers indicate a difficult rating, and teachers (90%) indicate a moderate rating; however, *JA Titan* students performed considerably well on this question (63.1% obtained the correct answer). Thus, in the analysis, student respondents were organized into two groups, those that scored above 50% and those that scored at 50% and below. By utilizing this grouping it was possible to obtain a higher degree of consistency in student performance for the purpose of assessing the reliability of specific content area questions in measuring knowledge gain.

As a result of analyzing the performance of the higher performing group, one item was removed from the analysis because it was the only case where a significantly higher number of students than expected in the upper scoring bracket chose the incorrect answer and the majority of teachers and volunteers rated the question as moderate to difficult. Ultimately, the mixed perceptions of teachers and volunteers about the difficulty level of the content area assessment items indicate that student performance on those questions should be interpreted with caution. Although all content area questions were drawn directly from the *JA Titan* curriculum (“Guide for Volunteers and Teachers”) and reviewed by JA Worldwide prior to inclusion in the student

assessments, they might not accurately measure the concepts that students are learning in the classroom among the various *JA Titan* sites; this would provide some explanation for the low overall test scores and inconsistencies across sites.

Interviews with teachers and volunteers, focus groups with students, and classroom observations, revealed that the teacher and volunteer are critical in linking the simulation to core economic concepts and reinforcing them throughout the simulation. Promising practices in linking concepts to application were revealed during interviews with teachers and volunteers and classroom observations. One teacher, for example, stated that she planned her honors curriculum around the *JA Titan* simulation sessions and that students spent multiple days working on assignments linked to the simulation. Another teacher was observed reminding students about the core concepts from their micro-economics curriculum while they were engaging in the simulation sessions, and the volunteer would pause after a set number of business quarters had elapsed to review those concepts and discuss how they related to the different teams strategies and their performance. One volunteer was observed reviewing a printout of a company report from the prior simulation exercise before starting the new simulation session. This volunteer explained that he would at times give the students homework assignments that required them to analyze the company reports and the market conditions in which their companies were operating. Another volunteer Reported giving students similar homework assignments. Classroom observations and student feedback from focus groups indicate that they benefit from such analytical discussions of the simulation results. Due to the finding that most volunteers do not utilize the “Guide for Volunteers and Teachers” to instruct students through the simulation, the importance of volunteers’ and teachers’ roles in explaining and reinforcing core concepts and their application in the simulation and real world scenarios is increased.

Recommendations

Research supports that computer technology, such as the *JA Titan* simulation, is most effective when used in conjunction with traditional instruction, with teachers serving as guides to coach students with questioning and probe them toward a more in-depth learning of curriculum (Maxwell et al., 2004). Both Maxwell et al, (2004) and Fadel & Lemke, (2006) suggest that the use of technology alone does not constitute an effective program or teaching method, but the combination of using technology with traditional instruction and continual interaction can provide an effective means of teaching. Additionally, research also supports that the educational impact of simulations such as *JA Titan* depends on the degree of focused interaction between the user and the system; that is, whether or not a simulation increases learning depends largely upon the extent to which it requires “the concentrated attention of the user continuously reinforces knowledge, scaffolds learning, provides leveled, appropriate challenges, and provides context to the learning of content” (Fadel & Lemke, 2006). See Attachment VI for a literature review conducted on the use of technology to teach business and economics concepts to high school students through simulation games.

Classroom observations, and the perceptions of teachers, volunteers, and students support these findings, indicating that the *JA Titan* simulation is an effective learning tool because it permits step by step learning, an appropriate level of challenge (in most cases), experimentation,

reinforcement, and to a certain extent, context. But equally clear is that the teacher and volunteer play critical roles in providing context and bridging the gap between concepts and application, and in cases where the teacher or volunteer fail to adequately carry out this role, students might not learn how to make such a connection between the simulation and real world economic scenarios. Evaluation findings indicate that while the *JA Titan* program has some common impacts on students across classrooms and sites; its implementation is typically quite individualized based on the preferences of the teacher and volunteer.

The following are specific recommendations for program enhancement based on the data collected for this evaluation:

Provide examples of *JA Titan* classroom implementation promising practices for teachers and volunteers. In interviews, some volunteers indicated that the training they received for classroom implementation was insufficient. For example, in some cases volunteers only received packets with a copy of the *JA Titan* CD. Additionally, in an online survey, 71% of JA staff participants indicated that it was difficult to recruit qualified volunteers for the *JA Titan* program. One respondent reported that some potential volunteers are deterred from participating in the program because they are not confident that the utilization of the computer is an effective way to interact with students. Thus, the development of some form of visual presentation of effective *JA Titan* classroom implementation could help market the program to potential volunteers, as well as assist current volunteers in enhancing their teaching styles.

Provide some navigation and content instructions for the *JA Titan* CD with the classroom materials. In interviews, some volunteers expressed that it was initially difficult to learn how to navigate the simulation and that they did not know what information was actually available on the CD (i.e. company reports and market data). In an online survey, a staff participant also noted that one of the greatest challenges to recruiting volunteers is that the computer requirements and overall complexity of the simulation can be overwhelming to some potential volunteers. Additionally, 42.9% of JA staff indicated that it is difficult to train volunteers for the *JA Titan* program. Participants reported that among the greatest challenges to training volunteers was the time required to get volunteers started with the program's computer component. One participant noted that hesitancy with the complexity of the website is the most challenging aspect of training. Thus, the provision of a brief content and navigation guide along with the CD could alleviate the overall time required by volunteers to familiarize themselves with the program, as well as the initial fears of those volunteers that might feel overwhelmed.

Revise the presentation of the “*JA Titan* Guide to Teachers and Volunteers.” In interviews with teachers and volunteers the majority sentiment was that the seven sessions of the *JA Titan* program take too long to implement given the time constraints posed by regular coursework and material. Some teachers perceived that the curriculum content had too much information for students to absorb in seven sessions. Thus, the guide should be revised to provide plans for shorter and longer implementation periods. Teachers, volunteers, and students also reported that neither the guide nor the student workbook adequately explain the concepts of charitable giving or market research. One volunteer noted that students only learn that increasing investment in either of those activities usually results in increased sales, but that they never learn why. In focus groups, students also expressed a lack of understanding about these concepts.

Attachment I

JA Titan Pre-Evaluation Form

Thank you for participating in this *Junior Achievement Titan* program evaluation. The purpose of this evaluation is to improve our program and to ensure that we continue to provide quality educational instruction that helps students excel both academically and in their personal lives.

Student Identification:

_____ / _____ / _____
First two letters of first name / First letter of last name / Birth date (two digit month and two digit day)

Example: The identification for Jason Smith born on March 1, 1990 is JA / S / 0301

Gender:

- Male
- Female

How many *JA Titan* sessions have you attended?

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8 or more

Ethnicity:

- African American
- Hispanic
- Asian / Pacific Islander
- White / Non-Hispanic
- Other: _____

Have you ever participated in any other *JA* programs?

- Yes
- No

Grade Level:

- 9th
- 10th
- 11th
- 12th

Have you ever participated in a high school economics class?

- Yes
- No

For Questions 1 through 5: Please write the letter of the correct term in the space before each definition.

1. _____ The goods or services produced by a company and offered for sale	a. Demographics
2. _____ The point at which income from sales equals costs	b. Product
3. _____ The process of changing resources into goods to satisfy the needs or wants of customers	c. Break-Even Point
4. _____ Increasing amounts of variable resources crowd fixed resources, resulting in reduced production	d. Production
5. _____ The characteristics of human populations and population segments, especially when used to identify consumer markets	e. Law of diminishing returns

For Questions 6 through 12: Please choose the letter of the response that would make each statement true.

6. When setting an appropriate price for a product a business must determine its...
- a. Break-Even Point
 - b. Law of diminishing returns
 - c. Product life cycle
 - d. All of the above
7. In order to attract investors for your business you should prepare graphs that show...
- a. Production and factory capacity
 - b. Decisions for price, production, and marketing
 - c. Gross Margin
 - d. All of the above
8. If a product is in the decline phase of the product life cycle...
- a. A business should increase spending on capital investment to expand production
 - b. It might have been replaced by a similar product from a competitor
 - c. A business should increase spending on marketing to its target population

- d. All of the above
9. A business might spend money on capital investment in order to...
- a. Increase depreciation
 - b. Increase production capacity
 - c. Reduce inventory
 - d. All of the above
10. Businesses sometimes choose to share their resources because they...
- a. Desire to make a positive impact on their local community
 - b. Want to be viewed favorably by their customers and the community
 - c. Have a responsibility to their community
 - d. All of the above
11. Which of the following is an example of the “law of diminishing returns”?
- a. A company’s total income from sales is less than its combined costs of rent, insurance, materials, and labor, resulting in a profit loss
 - b. A company’s expenditures on capital investment are less than the value of its losses due to depreciation, causing a decrease in production capacity
 - c. A company increases staff members, production, and sales over several quarters, but experiences a production drop in its most recent quarter compared to previous one
 - d. None of the above
12. Your factory has produced more of a product than were ordered for the last two quarters and your inventory costs have become a problem. If you can’t lower prices any further or cut production; what other options do you have to sell more of your product?
- a. Increase marketing, increase research and development
 - b. Increase marketing, decrease research and development
 - c. Decrease marketing, increase research and development
 - d. Decrease marketing, decrease research and development

13. Please indicate the extent to which you **agree or disagree** with the following statements.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
a. I enjoy coming to school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I know how to succeed in school	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. I am planning to pursue a college degree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. I am interested in economics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. I am interested in business related careers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. I am interested in starting a business	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14. Please indicate the extent to which you **agree or disagree** with the following statements.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
a. I am able to effectively analyze information on a chart or a graph	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I understand discussions about the economy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. I am comfortable working with numbers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. I am able to use information to solve problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. I am confident in my ability to work well on a team	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. I am able to effectively set goals and develop a plan to attain those goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. I am confident in my ability to make decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. I am able to use information to solve problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. I am comfortable using computers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. I am comfortable using computers to analyze data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. I am able to apply what I learn in school to the real world	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l. I am able to interact well with my teachers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. Please indicate how often you do the following.

	Not at all	Rarely	A few times a month	A few times a week	About once a day	More than once a day
a. Read business or economics related material other than for schoolwork	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. Talk with someone about business or economics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. Manage personal finances	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. Please indicate the extent to which you **agree or disagree** with the following statements.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
a. I have the skills employers are looking for	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I am confident that I can get a job that I like	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. I am confident that I would perform well at a job	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. I am confident that I would succeed in college	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. I am confident that I would succeed in a career	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. Please indicate the extent to which you **agree or disagree** with the following statements about the *JA Titan* program.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
a. <i>JA Titan</i> instructors helped me understand important economics concepts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. <i>JA Titan</i> computer simulation exercises helped me understand important economics concepts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. <i>JA Titan</i> group activities helped me understand important economics concepts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. I can apply what I learned in the <i>JA Titan</i> program to real world situations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. What area did you like **most** about the program? Please select one.
- a. Program topic
 - b. Instructor
 - c. Computer Simulation
 - d. Activities
 - e. Relevance of content to the real world
 - f. Other_____
19. What area did you like **least** about the program? Please select one.
- a. Program topic
 - b. Instructor
 - c. Computer Simulation
 - d. Activities
 - e. Relevance of content to the real world
 - f. Other_____
20. Were you satisfied with your overall experience in the *JA Titan* program?
- a. Yes
 - b. No
21. Are you interested in participating in other programs such as *JA Titan*?
- a. Yes
 - b. No
22. Would you recommend the *JA Titan* program to your friends?
- a. Yes
 - b. No

Attachment II

***JA Titan* Evaluation Student Survey Teacher Classroom Cover Page**

School Name: _____

Teacher Name: _____ Grade: _____

Volunteer Name: _____

This package contains surveys for*:

***JA Titan* participants**

***Non-JA Titan* participants**

of surveys: _____

of surveys: _____

Date surveys administered: ____/____/____

JA Titan class timeframe (if applicable): Start date: ____/____/____

End date: ____/____/____

Student identifications are complete

(IDs are the first two letters of a student's first name, the first letter of student's last name, and the two digit month and two digit day of the student's birthday, e.g., Daniel Martin, born May 6 = DAM0506)

Comments: _____

* A separate "Teacher Classroom Cover Page" should be completed for each *JA Titan* class and each *Non-JA Titan* class. This is important for our tracking and to ensure a proper analysis of survey results.

Attachment III

JA Titan Evaluation – Teacher Satisfaction Survey

1. School Name, City, and State
2. What is the total amount of time you have been teaching?
 - Less than 1 year
 - 1-5 years
 - More than 5 years
3. For how long have you been teaching at the high school level?
 - Less than 1 year
 - 1-5 years
 - More than 5 years
4. Please indicate the grade levels you have taught:
 - Pre-kindergarten
 - Kindergarten
 - Elementary School
 - Junior High School
 - 9th grade
 - 10th grade
 - 11th grade
 - 12th grade
 - Other: _____
5. Please indicate the subjects in which you have experience teaching.
6. How many times has *JA Titan* been presented in your classroom?
7. How many times have you had any other JA program presented in your classroom?

Program Implementation, Impact and Satisfaction

8. Please indicate the extent to which you agree or disagree with the following statements about the implementation of the *JA Titan* program:

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
g. The goals of the <i>JA Titan</i> program are clearly defined and articulated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. Concepts are explained clearly and effectively	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. The role of the teacher in the classroom is clearly defined and articulated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

j. The role of the volunteer is clearly defined and articulated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. The volunteer developed a rapport with the students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l. Interaction between the volunteer and the teacher in the classroom was effective	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
m. Sufficient interaction occurred between the volunteer and the students during the simulation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
n. Sufficient time was allocated for debriefing with students following each simulation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
o. The simulation was easy to understand and utilize in class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
p. <i>JA Titan</i> program content was sufficiently aligned to state standards for high school economics curricula	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
q. <i>JA Titan</i> program material is appropriate for the skill levels of student participants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
r. School site support from JA Staff was sufficient to effectively implement the program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
s. Communication flow between JA staff and school site personnel is effective	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
t. The program materials and the simulation effectively complement and reinforce one another	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. Please indicate the extent to which you agree or disagree that the *JA Titan* program and simulation improves the following student attitudes.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
a. The <i>JA Titan</i> program increases students' interest in economics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

b. The <i>JA Titan</i> program increases students' interest in business	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. The simulation is challenging for students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. The simulation increases students' motivation to learn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. The simulation improves students' focus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. The simulation is an effective teaching tool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. Please indicate the extent to which you agree or disagree that the *JA Titan* program increases the following student abilities.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
m. To effectively analyze information on a chart or a graph	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
n. To work well on a team	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
o. To set goals and develop a plan to attain those goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
p. To make decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
q. To think critically	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
r. To solve problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
s. To use computers to analyze information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
t. To understand important economics concepts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
u. To understand important business concepts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
v. To apply what they learn in the <i>JA Titan</i> program to the real world	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
w. To work with computers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
x. To interact effectively with teachers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

d.	<p>A business might spend money on capital investment in order to...</p> <ul style="list-style-type: none"> a. Increase depreciation b. Increase production capacity c. Reduce inventory d. All of the above 	○	○	○
e.	<p>Businesses sometimes choose to share their resources because they...</p> <ul style="list-style-type: none"> a. Desire to make a positive impact on their local community b. Want to be viewed favorably by their customers and the community c. Have a responsibility to their community d. All of the above 	○	○	○
f.	<p>Which of the following is an example of the “law of diminishing returns”?</p> <ul style="list-style-type: none"> a. A company’s total income from sales is less than its combined costs of rent, insurance, materials, and labor, resulting in a profit loss b. A company’s expenditures on capital investment are less than the value of its losses due to depreciation, causing a decrease in production capacity c. A company increases staff members, production, and sales over several quarters, but experiences a production drop in its most recent quarter compared to previous one d. None of the above 	○	○	○
g.	<p>Your factory has produced more of a product than were ordered for the last two quarters and your inventory costs have become a problem. If you can’t lower prices any further or cut production; what other options do you have to sell more of your product?</p> <ul style="list-style-type: none"> a. <u>Increase</u> marketing, <u>increase</u> research and development b. <u>Increase</u> marketing, <u>decrease</u> research and development c. <u>Decrease</u> marketing, <u>increase</u> research and development d. <u>Decrease</u> marketing, <u>decrease</u> research and development 	○	○	○

17. Please provide any additional comments that you feel will help us understand the quality or effectiveness of the *JA Titan* program.

JA Titan Evaluation – Volunteer Satisfaction Survey

11. School Name, City, and State

12. What is your current occupation title?

13. How many times have you volunteered to teach *JA Titan*?

14. Do you have any previous experience volunteering with Junior Achievement?

a. Yes b. No

15. If yes, what other JA programs have you taught?

16. Do you have any previous teaching experience?

a. Yes b. No

17. Please indicate the grade levels you have taught:

- | | |
|---|--|
| <input type="radio"/> Pre-kindergarten | <input type="radio"/> 10 th grade |
| <input type="radio"/> Kindergarten | <input type="radio"/> 11 th grade |
| <input type="radio"/> Elementary School | <input type="radio"/> 12 th grade |
| <input type="radio"/> Junior High School | <input type="radio"/> Other: _____ |
| <input type="radio"/> 9 th grade | |

18. Please indicate the subjects in which you have experience teaching

Program Implementation, Impact and Satisfaction

19. Please indicate the extent to which you agree or disagree with the following statements about the implementation of the *JA Titan* program:

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
u. The goals of the <i>JA Titan</i> program are clearly defined and articulated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
v. Concepts are explained clearly and effectively	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
w. The role of the volunteer is clearly defined and articulated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
x. The role of the teacher in the classroom is clearly defined and articulated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

y. The assistance provided by the teacher in the classroom was sufficient to effectively implement the program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
z. Interaction between the volunteer and the teacher in the classroom was effective	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
aa. The teacher in the classroom was actively engaged in assisting with the student participants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
bb. The simulation was easy to understand and utilize in class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
cc. <i>JA Titan</i> program material is appropriate for the skill levels of student participants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
dd. Communication flow between JA staff and school site personnel is effective	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ee. School site support from JA Staff was sufficient to effectively implement the program	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ff. Technical support for the simulation was sufficient	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
gg. The program materials and the simulation effectively complement and reinforce one another	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

20. Please indicate the extent to which you agree or disagree that the *JA Titan* program and simulation *improve the following student attitudes*.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
g. The <i>JA Titan</i> program increases students' interest in economics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. The <i>JA Titan</i> program increases students' interest in business	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. The simulation is challenging for students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. The simulation increases students' motivation to learn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

k. The simulation improves students' focus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l. The simulation is an effective teaching tool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

21. Please indicate the extent to which you agree or disagree that the *JA Titan* program increases the following student abilities.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
y. To effectively analyze information on a chart or a graph	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
z. To work well on a team	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
aa. To set goals and develop a plan to attain those goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
bb. To make decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
cc. To think critically	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
dd. To solve problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ee. To use computers to analyze information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ff. To understand important economics concepts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
gg. To understand important business concepts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
hh. To apply what they learn in the <i>JA Titan</i> program to the real world	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ii. To work with computers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
jj. To interact effectively with teachers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. Were you satisfied with your overall experience in the *JA Titan* program?

a. Yes

b. No

13. Would you recommend volunteering to teach the *JA Titan* program to other professionals?

a. Yes

b. No

14. Please rank from 1 to 3 in order of importance what you consider to be the most important educational aspects of the *JA Titan* program.

15. Please indicate what you consider to be the least important educational aspect of the *JA Titan* program.

16. In the following section please select whether the following 7 questions would be *Easy*, *Moderate*, or *Difficult* for students based on your knowledge of the *JA Titan* program material:

		Easy	Moderate	Difficult
a.	When setting an appropriate price for a product a business must determine its... a. Break-Even Point b. Law of diminishing returns c. Product life cycle d. All of the above	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b.	In order to attract investors for your business you should prepare graphs that show... a. Production and factory capacity b. Decisions for price, production, and marketing c. Gross Margin d. All of the above	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c.	If a product is in the decline phase of the product life cycle... a. A business should increase spending on capital investment to expand production b. It might have been replaced by a similar product from a competitor c. A business should increase spending on marketing to its target population d. All of the above	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d.	A business might spend money on capital investment in order to... a. Increase depreciation b. Increase production capacity c. Reduce inventory d. All of the above	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e.	Businesses sometimes choose to share their resources because they... a. Desire to make a positive impact on their local community b. Want to be viewed favorably by their customers and the community c. Have a responsibility to their community d. All of the above	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f.	Which of the following is an example of the "law of diminishing returns"? a. A company's total income from sales is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	<p>less than its combined costs of rent, insurance, materials, and labor, resulting in a profit loss</p> <p>b. A company's expenditures on capital investment are less than the value of its losses due to depreciation, causing a decrease in production capacity</p> <p>c. A company increases staff members, production, and sales over several quarters, but experiences a production drop in its most recent quarter compared to previous one</p> <p>d. None of the above</p>			
g.	<p>Your factory has produced more of a product than were ordered for the last two quarters and your inventory costs have become a problem. If you can't lower prices any further or cut production; what other options do you have to sell more of your product?</p> <p>a. <u>Increase</u> marketing, <u>increase</u> research and development</p> <p>b. <u>Increase</u> marketing, <u>decrease</u> research and development</p> <p>c. <u>Decrease</u> marketing, <u>increase</u> research and development</p> <p>d. <u>Decrease</u> marketing, <u>decrease</u> research and development</p>	○	○	○

17. Please provide any additional comments that you feel will help us understand the quality or effectiveness of the *JA Titan* program.

JA Titan Evaluation – Staff Survey

22. Name of JA Area Office: _____

23. Occupation Title

24. *JA Titan* roles and responsibilities

4. Length of employment with JA Area Office?

- Less than 1 year 1-5 years 6-10 years 10 or more years

5. Length of employment at current position

- Less than 1 year 1-5 years 6-10 years 10 or more years

Program Implementation, Impact and Satisfaction

6. Please indicate the extent to which you agree or disagree with the following statements about the implementation of the *JA Titan* program:

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
hh. The goals of the <i>JA Titan</i> program are clearly defined and articulated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ii. JA staff have sufficient resources to provide effective school site support	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
jj. Communication flow between JA staff and school site personnel is effective	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
kk. The role of the teacher in the classroom is clearly defined and articulated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ll. The role of the volunteer is clearly defined and articulated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

mm. The simulation is easy to understand and utilize for school site volunteers and teachers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
nn. <i>JA Titan</i> program content is sufficiently aligned to state standards for high school economics curricula	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If you have observed the *JA Titan* program, please answer questions 7 and 8.

7. Please indicate the extent to which you agree or disagree that the *JA Titan* program and computer simulation improves the following student attitudes.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
m. The <i>JA Titan</i> program increases students' interest in economics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
n. The <i>JA Titan</i> program increases students' interest in business	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
o. The simulation is challenging for students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
p. The simulation increases students' motivation to learn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
q. The simulation improves students' focus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
r. The simulation is an effective teaching tool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. Please indicate the extent to which you agree or disagree that the *JA Titan* program increases the following student abilities.

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
kk. To effectively analyze information on a chart or a graph	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ll. To work well on a team	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
mm. To set goals and develop a plan to attain those goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
nn. To make decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

oo. To think critically	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
pp. To solve problems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
qq. To use computers to analyze information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
rr. To understand important economics concepts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ss. To understand important business concepts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
tt. To apply what they learn in the <i>JA Titan</i> program to the real world	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
uu. To work with computers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
vv. To interact effectively with teachers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please answer the following questions about recruitment and training for the *JA Titan* program.

9. Is it difficult to recruit qualified volunteers for the *JA Titan* program?

- a. Yes b. No

c. If yes, what poses the greatest challenge to recruiting qualified volunteers?

10. Is it difficult to train volunteers for the *JA Titan* program?

- a. Yes b. No

c. If yes, what poses the greatest challenge to training volunteers?

11. Are teachers generally receptive to having the *JA Titan* program in their classrooms?

- a. Yes b. No

c. If no, what poses the greatest challenge to teachers' receptivity?

12. Please rank from 1 to 3 in order of importance which educational aspects of the *JA Titan* program you feel would most likely appeal to teachers.

13. Please indicate which educational aspect of the *JA Titan* program you feel would least likely appeal to teachers.

14. Please provide any additional comments that you feel will help us understand the quality or effectiveness of the *JA Titan* program.

DRAFT

Attachment IV

JA Titan Evaluation Pre/Post-Assessment Student Respondent Demographics

Grade Level	JA Titan		Non-JA Titan	
9th	8	2%	2	1%
10th	12	3%	19	9.9%
11th	35	8.8%	31	16.1%
12th	342	86.1%	140	72.9%
Total	397	100%	192	100%
Gender				
Male	198	50%	96	50.3%
Female	198	50%	95	49.7%
Ethnicity				
African American	39	9.9%	7	3.6%
Hispanic	65	16.5%	22	11.5%
Asian/Pacific Islander	14	3.6%	7	3.6%
White/non-Hispanic	154	65.6%	154	80.2%
Other	2	4.3%	2	1%
Participated in other JA Programs				
Yes	79	20.7%	30	16%
No	303	79.3%	157	84%
Participated in High School Economics Class				
Yes	184	46.9%	105	55%
No	208	53.1%	86	45%

Attachment V

The Impact of Technology-based Teaching Methods A Literature Review for *JA Titan*

Source:

See “Bibliography” at the end of this document for a list of literature used in this literature review.

Purpose:

To provide Junior Achievement with a literature review on the implementation and impact of technology-based teaching methods, with an emphasis on the use of technology to teach business and economics concepts to high school students through simulation games.

Methodology:

The organization archives and databases searched for this literature review included but were not limited to International Society for Technology and Education (ISTE), North Central Regional Education Laboratory (NCREL), JSTOR The Scholarly Journal Archive, Education Resources Information Center (ERIC), University of Southern California Scholar’s Portal, ProQuest, Wilson Omnifile, Lexus Nexus Academic Universe, WorldCat, Google Scholar, and various other university databases and electronic resources.

Various combinations of Boolean search terms were utilized in our search on databases, including “technology and education,” “technology and teaching,” “simulation and education,” “economics and education and technology,” “business and education and technology,” “high school and economics and computer”. A full listing of key terms used is available upon request.

Summary of Literature:

A review of literature suggests that the use of technology-based instruction has positively impacted student achievement, learning and attitudes toward complex subjects such as business and economics. Further, research has found that technology-based instruction can contribute to the development of workforce skills. Literature suggests that these benefits are more likely to be attained when technology-based programs are implemented thoughtfully, systematically and with intended goals. For instance, one study suggests that an effective way to use computer technology in the classroom is through the implementation of learning games and simulation activities along with traditional instruction. Although the development and utilization of simulation games is not new, it has not been until the last decade that classrooms have begun to fully explore their potential, particularly at the elementary, middle, and high school levels.

The implementation of technology-based teaching methods

In an article published in the *Journal of Management* entitled “The role of management games and simulations in education and research”, the authors state that the advance of business games developed in the late 1950s was spawned by the fusion in the development in war games,

operations research, computer technology, and educational theory (Keys & Wolfe, 1990). According to this article, a game entitled *Top Management Decision Game* appears to be the first business game used in a college classroom. The game was administered at the University of Washington in 1957 to teach students business concepts. Since the introduction of this game in the late 1950s, the utilization of simulation games in the classroom continues to expand and now reaches not only colleges but also high schools, middle schools, and even elementary schools. Due to the popularity in the implementation of technology in the classrooms, recent studies have focused on the effectiveness of these technology programs. Most literature suggests that benefits of technology-based instruction are positive and promising; however, the literature also indicates that simulation games in the classroom are only as effective as the effectiveness of their implementation.

In a meta-analysis across 42 studies entitled “Technology in Schools: What the Research Says”, the authors found that various aspects contribute to the effective implementation of technology-based programs in the school setting (Fadel and Lemke, 2006). Fadel and Lemke point out that the actual implementation of the technology is crucial to its success as a teaching and learning tool in a school setting. They argue that Computer Assisted Instruction (CAI), if implemented thoughtfully and systematically, is one of the most effective uses of educational technology in schools. According to Fadel and Lemke, success depends on key elements that include school leadership, teacher technical proficiency, sufficient opportunities for professional development, the fit of the technology with curriculum, school culture, and specific pedagogical approaches utilized, as well as technology access. Moreover, they recommend that due to the variety of potential configurations of the various key elements that can achieve success in student learning, educators pilot the various elements and examine the effects prior to full-scale implementation of the program.

Fadel and Lemke’s report found that most technology-based programs were developed to provide real world applications to concepts for students to learn (Fadel and Lemke, 2006; Roschelle et al, 2000). Fadel and Lemke also note that the use of technology serves a variety of purposes, but most programs they reviewed focused on increasing student learning and achievement. Their review of literature also found technology-based programs were developed to improve teaching instruction, leadership, and educational and instructional decision making, in addition to enhancing myriad other student benefits. Examples of specific outcomes for students in these programs included enhanced engagement, improved technology literacy, and skills such as critical thinking, sound reasoning, global awareness, communication skills, information and visual literacy, scientific reasoning, productivity, and creativity (Fadel and Lemke, 2006).

Studies have shown that an effective way to use computer technology in the classroom is through the implementation of learning games along with traditional instruction. One study suggests that when this blend of traditional instruction is used with technology applications, students develop several cognitive skills, such as organizational abilities, including the student’s ability to pay attention and conduct self-monitoring (McDonald & Hannafin, 2003). When computer technology is used in conjunction with traditional instruction, teachers become guides to coach students with questioning and probe them toward more in-depth learning of curriculum (Maxwell et al., 2004). Further, Fadel and Lemke note that the impact of games on learning appears to depend on the degree of interaction between the user and the system. According to the authors,

whether or not a game increases learning depends largely upon the extent to which it requires “the concentrated attention of the user continuously reinforces knowledge, scaffolds learning, provides leveled, appropriate challenges, and provides context to the learning of content” (Fadel & Lemke, 2006). Both of these studies suggest that the use of only technology itself does not constitute an effective program or teaching method, but the combination of using technology

with traditional instruction and continual interaction provides an effective means of teaching.

Snapshot: Zapitalism

Zapitalism is a business simulation game developed by LavaMind, where a player operates a simulated retail business in a fantasy futuristic economy. The program was designed by an ex-Morgan Stanley financial analyst. It models real-world economics, simulating actual business and sales cycles. Students can play alone or in groups and can also compete against the computer, which can be set to various levels of intelligence. Among the key concepts that students learn by playing the game are the following:

- Profit Margins
- Supply & Demand
- Growing a Business
- Fiscal Responsibility
- Inventory Management
- Managing Debt
- Public Relations
- Labor Issues
- Advertising
- Insurance
- Financial Planning

Zapitalism has received numerous awards and has received widespread media coverage. The program been used in numerous high school and college courses nationwide.

Additional information about *Zapitalism* or other LavaMind products can be found at: <http://www.lavamind.com/zap.html>

Although the development and utilization of simulation games is not new, it has not been until the last decade that classrooms have begun to realize their potential, particularly at the elementary, middle, and high school levels. For example, *Thinking Economics* is a web-based economic simulation game that allows high school students to use hands-on technology, and to explore challenging concepts at their own pace. The simulation activity can be played at either the individual or group level, with students making decisions that ultimately impact their profit margins. Programs can also be customized to fit teaching styles and course objectives.

In another simulation game, *Zapitalism*, high school and college students can compete with each other to build a futuristic retail empire. They interact and engage in financial transactions with simulated inhabitants of another planet, Zapinalia. Students invest in stocks & bonds, strategize to dominate the market, and construct mega stores. *Thinking Economics* and *Zapitalism* are only two examples of a broad array of computerized or simulated economic strategy games available to engage students and teach them fundamental economic and business concepts in a classroom setting.

The impact of technology-based instruction on attitudes, behaviors and academic achievement

A review of literature suggests that technology-based instruction has had positive effects on students. Specifically, studies show that through the effective use of technology in the classroom, students’ achievement and academic performance increase in relation to content area learning, higher order ranking, problem solving, and workforce preparation (Cradler et al., 2002). Further, literature also indicates that technology-based instruction positively impacts students’ attitudes toward complex subject matters and improves student workforce. However, despite these positive impacts a review of literature also suggests that further exploration of impacts should be conducted as technology becomes more widely used as a method of instruction.

Studies have found that simulation games can have a positive effect on academic performance.

In an article entitled “How does Technology Influence Student Learning?” by Cradler et al. (2002), Cradler discusses a study in which it found that “fourth-grade students who used computers primarily for ‘math/learning games’ scored higher [on the 1996 National Assessment of Educational Progress (NAEP)] than students who did not.” In another study, research found that students participating in their school’s technology-integrated school reform efforts demonstrated average increases of 94 points in combined SAT-I performance over students who participated in the traditional school experience.

In addition to improved academic performance, literature suggests other impacts of using technology-based instruction. For example, an article in the *Journal of Research on Computing in Education* indicates that games can be viewed as cognitive tools, promoting achievement in a variety of skills (McDonald & Hannafin, 2003). Because students are actively participating in the learning process, they are more likely to remember the information presented to them. According to McDonald and Hannafin, when games incorporate just the right amount of challenge, they appeal to the student’s curiosity, while at the same time they allow some element of control. Simulation games also help in developing several cognitive skills such as organizational abilities, including the student’s ability to pay attention and conduct self-monitoring.

Another impact of simulation games is students’ ability to learn complex subject matter more effectively (Gremmen & Potters, 1997; Maxwell et al., 2004). According to Maxwell et al. (2004) in the article *Developing a Problem-Based Learning Simulation: An Economics Unit on Trade*, simulation games are ideal tools to enhance learning of complex subject matter because the simulation’s structure provides a step-like approach that facilitates attainment of curriculum goals by focusing the line of inquiry. The literature found that a simulation ensures that resources and processes lead students toward knowledge of desired concepts and principles, which guide students and teachers through the overwhelming complexity.

According to Cradler et al. (2002), simulation games also increase a student’s capability of higher-order thinking. Specifically, technology tools for constructing artifacts and electronic information and communication resources support the development of higher-order thinking skills (e.g., information research, comparing and contrasting, synthesizing, analyzing, and evaluating). According to Cradler’s article, the use of technology, such as simulation games, increases the skills necessary to convert simple data into information and information into knowledge. The article discusses a study that reviewed the impact of an interactive video program used to teach students mathematics. The study found that students who used the video program were better able to complete complex problem-solving tasks than those students that did not use the program; thus the increase in higher-order thinking lead to better problem solving capabilities. Cradler suggests that through the development of higher-order skills students are able to make better decisions and pay closer attention by analyzing their different options in a more detailed manner. This attention to detail ultimately leads to better problem solving capabilities.

Research on the benefits of technology-based instruction suggests that this form of teaching can increase a student’s interest in a subject matter, as well as motivate them to learn. In one study, an internet-based interactive teaching aid was used to introduce undergraduate students to the

domestic and international consequences of monetary policy (Santos, 2000). Surveys with students at the conclusion of the program found that they were more motivated and interested in the field of economics because they played the simulation game against fellow classmates and the program provided them with real-time outcomes based on their decisions, as well as the decisions of other students (Santos, 2000). Further, through the utilization of the interactive teaching aid, student surveys indicated that the game helped them academically by increasing their understanding of domestic and international implications of monetary policy. Millerd & Robertson (1987) also developed two online, interactive computer simulations in teaching intermediate-level macroeconomics. The models were designed to be part of an integrated instructional experience in which lectures, text, exercises, and computer simulations complemented and reinforced one another. Millerd & Robertson found that through game simulation students were positively affected by either an improved understanding of macroeconomics, more interest in the study of macroeconomics, or an improved attitude toward economics

The utilization of computer simulation games has the potential to increase student achievement and performance, but research supports that it is also a potential facilitator for the better understanding of valuable professional, technical, and social skills. For example, Herz & Merz, (1998) point out that learning by its very nature is not only a content process but a holistic process where students must learn to work as a group in order to achieve a goal, thus helping students gain a better understanding of human interactions. This better understanding of human interaction, they argue, will ultimately prepare students for the workforce. Through the development of social skills and the knowledge acquired through simulation games (e.g., computer skills, web site development programs, use of internet, etc) students enter the workforce armed with prerequisite skills for workforce preparedness (Cradler et al, 2002).

Finally, simulation games do not only help students but can also benefit teachers by enhancing the effectiveness of their teaching methods (Maxwell et al., 2004). According to the authors, simulation games increase the effectiveness of teaching because when students need to know material in the curriculum in order to proceed toward possible solutions to a given problem, teachers are more likely to engage students in dialogues and they are more perceptive to lectures or textbook reading. Because of this, teachers coach students with questioning and probe them toward more in-depth learning of the curriculum.

Despite the multitude of literature that supports the positive impact of technology-based instruction on students, some studies have indicated that impact of computer-based educational gaming on achievement is relatively small. Sosin et al., (2004), for example, found that although the effect of the technology on student performance was positive and significant, the actual size of the effect was minimal. Additionally, Porter et al., (2004) points out that there have been very few controlled studies of the effectiveness of simulation in teaching economics from which to draw conclusions about the effectiveness of different categories of simulations. Both of these authors take a more careful approach to the actual benefits of simulation games. Nonetheless, they both agree that the effects, although small, are an encouraging sign for the future development of computer-based instruction in general and simulations in particular.

Bibliography

- Cradler, J., McNabb, M., Freeman, M., Burchett, R. (2002). How Does Technology Influence Student Learning? *Learning & Leading with Technology*, 29(8) 46-56.
- Fadel, C., Lemke, C. (2006). Technology in Schools: What the Research Says. *Cisco Systems, Inc.*
- Gremmen, H., Potters, J. (1997). Assessing the Efficacy of Gaming in Economic Education. *Journal of Economic Education*, 28(4), 291-304.
- Herz, B., & Merz, W. (1998). Experiential learning and the effectiveness of economic simulation games. *Simulation & Gaming*, 29(2) 238-250.
- Keys, B., & Wolfe, J. (1990). The role of management games and simulations in education and research. *Journal of Management*, 16(2) 307-337.
- Maxwell, N. L., Mergendoller, J. R., Bellisimo, Y. (2004). Developing a problem-based learning simulation: An economics unit on trade. *Simulation Gaming*, 35(4), 488-498.
- McDonald, K., & Hannafin, R. (2003). Using Web-Based Computer Games to Meet the Demands of Today's High-Stakes Testing: A Mixed Method Inquiry. *Journal of Research on Computing in Education*, 35 (4).
- Millerd, F. W., & Robertson, A. R. (1987). Computer simulation as an integral part of intermediate macroeconomics. *The Journal of Economic Education*, 18(3) 269-286.
- Porter, T. S., Riley, T. M., Ruffer, R. L. (2004). A Review of the Use of Simulations in Teaching Economics. *Social Science Computer Review*, 22(4), 426-443.
- Santos, J. (2000). Developing and implementing an internet-based financial system simulation game. *Journal of Economic Education*, 33(1) 31-40.
- Sosin, K., Blecha, B. J., Rajshree, A., Bartlett, R. L., Daniel, J. I. (2004) Efficiency in the Use of Technology in Economic Education: Some Preliminary Results. *The American Economic Review*, 94 (2), 253-258.