

**INSEAD**

The Business School  
for the World

Centre for Advanced  
Learning Technologies

# Faculty & Research Working Paper

**Games in Career Guidance:  
Effectiveness of Using a SmallWorld  
Simulation to Develop Social Skills  
in the Workplace**

---

Katrina MAXWELL  
Albert A. ANGEHRN  
2008/10/OB/TOM/CALT

**Games in Career Guidance:  
Effectiveness of Using a SmallWorld Simulation  
to Develop Social Skills in the Workplace**

by  
Katrina Maxwell\*  
and  
Albert A. Angehrn\*\*

Version of 7 February 2008

This work has been sponsored by the CareerGuide for Schools Project funded by the European Commission's Socrates Programme Comenius 3, and the TENCompetence Integrated Project funded by the European Commission's 6th Framework Programme. We would also like to thank Glenys Kennedy, the head of the Anglophone section of the Lycée François Premier in Fontainebleau, France, for her insights and support.

\* Senior Research Fellow in the Centre for Advanced Learning Technologies (CALT) at INSEAD, Boulevard de Constance, Fontainebleau 77300, France, [katrina.maxwell@insead.edu](mailto:katrina.maxwell@insead.edu)

\*\* Professor of Information Technology, Director, Centre for Advanced Technology (CALT) at INSEAD, Boulevard de Constance, Fontainebleau 77300, France [albert.angehrn@insead.edu](mailto:albert.angehrn@insead.edu)

A working paper in the INSEAD Working Paper Series is intended as a means whereby a faculty researcher's thoughts and findings may be communicated to interested readers. The paper should be considered preliminary in nature and may require revision.

Printed at INSEAD, Fontainebleau, France. Kindly do not reproduce or circulate without permission.

**Games in Career Guidance:  
Effectiveness of Using a SmallWorld Simulation  
to develop Social Skills in the Workplace**

Katrina Maxwell and Albert A. Angehrn

Katrina Maxwell is a Senior Research Fellow in the Centre for Advanced Learning Technologies at INSEAD. She holds a Ph.D. in Mechanical Engineering and is the author of *Applied Statistics for Software Managers*. Her current research interests include the social aspects of information systems, career development, and the measurement of learning.

Albert A. Angehrn holds a doctoral degree in Mathematical Sciences and is Professor of IT and Entrepreneurship at INSEAD, where he directs the Centre for Advanced Learning Technologies (CALT). His research concentrates on the design and analysis of simulations and games in management education and on online collaboration dynamics.

**Abstract**

Success in the workplace is highly dependent on social skills. Nevertheless, although games are a fun and effective way to trigger learning, there appears to be a lack of realistic educational games which develop an awareness of the advanced social skills needed to succeed in one's career. In particular, young people, many of whom play video and computer games on a daily basis, should be highly receptive to a computer-enhanced approach to learning about effective social interaction in an organizational context, such as that found in the learning-by-doing management simulation experience which we describe in this paper. Although this simulation was initially developed for experienced managers, our quantitative research on a group of 14-17 year olds showed a significant measurable increase in their awareness of many advanced social skills in the workplace.

Keywords: adolescents; career guidance; games; learning effectiveness; simulations; social skills

## **Games in Career Guidance: Effectiveness of Using a SmallWorld Simulation to Develop Social Skills in the Workplace**

Katrina Maxwell and Albert A. Angehrn

Games are an effective and enjoyable way to support rich lifelong learning experiences, and are especially useful in triggering learning, knowledge structuring and cognitive change in children (Gros, 2007; Moll, 1990; Wadsworth, 1979). However, there do not appear to be many games developed or deployed in the area of career guidance. In addition, although computer games are widely played by young people, this promising vector for career related learning is currently underexploited, and the few ICT-based career guidance games that do exist are mainly introspective and egocentric. While it is important to find and get the best job that matches our abilities, unless we plan to be self-employed and have no clients, most of us are going to be working with other people who can make or break our career. Yet there appears to be no career guidance game which focuses on developing young people's awareness of the advanced social skills needed to succeed in the workplace.

Over the last ten years, the Centre for Advanced Learning Technologies (CALT) at INSEAD has pioneered and refined a computer simulation which models the dynamics of social and organizational contexts, including individual behaviors, group dynamics and cultural factors, to stimulate learning in complex domains such as change management, collaboration and innovation in organizations (Angehrn, 2005; Angehrn, 2006a; Manzoni & Angehrn, 1997). This has resulted in the development of several SmallWorld simulations (Angehrn, 2006b; Milgram, 1967) and similar experiential, learning-by-doing / learning-by-playing, game-based approaches which have now been developed and deployed successfully in management schools and universities, as well as private and public organizations world-wide.

During these simulations, which are based on founded research in organizational dynamics (Gilbert, 1993; Pfeffer & Sutton, 2000; Salen & Zimmerman, 2003; Van der Vegt & Bunderson, 2005; Yilmaz & Oren, 2003), players work in groups to solve a challenging management mission. SmallWorld simulations are based on realistic scenarios, and unlike traditional simulations, contain a set of believable characters with which players can interact. In contrast to traditional games, players learn by trying out a range of managerial actions during the simulation, and receiving immediate feedback on their decisions. The educational experience is enriched by group discussions before, during and after the simulation experience (Nonaka, 1994).

One of these advanced simulations, the EIS (Executive Information System) simulation, allows managers to experience the challenge of implementing change in an organization. One of the key pedagogical principles behind the EIS simulation is that the difficulty of succeeding in the management mission causes the players to become frustrated. This increases the probably of triggering real learning, as it can touch people at other levels than the purely cognitive or the superficially social exchange level, helping them become more aware of their own limits. Yet playing the EIS simulation is also fun. The fun comes from a number of sources, including the laughing generated by the character descriptions, and some of the ironic reactions of the simulated company, for example, character feedback, unexpected events and unexpected outcomes of decisions. Many managers who participate

recognize certain characters and situations from their own organizations. We believe the EIS simulation can also be used to help young people understand what it means to be a manager, become aware of office politics and better understand the importance of personal relationships in the working world. Therefore, we focused our research on testing two hypotheses:

- (i) Young people do not currently have a high level of the advanced social skills needed to succeed in the workplace.
- (ii) The EIS simulation can help increase their awareness of these skills.

The remainder of the paper is structured as follows: first we discuss the current availability of career guidance games, we then consider the need for a game that focuses on social skills in the workplace and present the results of our survey of the advanced social skills of 108 14-17 year olds. This is followed by a section on the benefits of SmallWorld simulations. We then describe the EIS simulation and its learning objectives. This is followed by a presentation of the EIS Career Guide workshop experiment and learning effectiveness results. Last, we discuss possible improvements to the EIS simulation and conclude the paper.

### **Current availability of career guidance games**

There do not appear to be many games developed or deployed in the area of career guidance in schools. With the help of our CareerGuide for Schools project partners in Bulgaria, Estonia, France, Germany, Greece, Lithuania, Romania and the UK, we were able to identify a fairly small number of career guidance games (INSEAD et al, 2007).

We found three main types of “games” aimed at young people: board games, PC software, and online games (see Table 1). The board games for 14-19 year olds focus on exploring careers, learning interview skills, working in teams, learning basic keys to job success, and job search skills. One positive aspect of the board games is that they are played in a group and thus generate discussion. We also identified some career guidance PC software for this age group to help students identify their skills, match their skills to suitable careers, explore careers, write resumes and cover letters, and identify their optimal working environment. We did find one PC software which claimed to teach social skills for job success but which really was just a list of some very basic bad social behaviors that will get you fired such as lying, making personal calls, criticizing your boss, taking too many breaks, or doing sloppy work. Finally, we found some interactive, single-user, online games used for self assessment, career discovery, job targeting, interviewing, and job hunting.

TABLE 1: Career Guidance Games for 14-19 year olds

<b>Types</b>	<b>Current Focus</b>
<b>Board Games</b>	Exploring careers, learning interview skills, working in team, basic keys to job success, job search skills.
<b>PC Software</b>	Identify skills, match skills to careers, explore careers, write resumes and cover letters, identify optimal working environment, basic keys to job success
<b>Online Games</b>	Interactive, introspective, single-user games for self assessment, career discovery, job targeting, interviewing, job hunting.

## **Need for a game that focuses on social skills in the workplace**

Current ICT-based career games are mainly interactive introspective single-user games. The games focus on the self – What do **I** want to do? What are **my** skills? What is the best job for **me**? How am **I** perceived? The unstated assumption is that the career guidance phase ends when the person gets the right job. Just like the typical love story where two people meet, fall in love and get married, the end. However, getting the right job is just the beginning! What skills do I need to be successful in my chosen career? Most of us enter the workforce innocently believing, much like in school, that if we do our job well and follow the rules we will be rewarded. However, at work, there are no exams to award promotions and the rules are unwritten. Success in the workplace is highly dependent on social skills.

In addition, most young people considering a career in business do not really know what being a manager in a large company means. Even if they have the opportunity to work in a company for a short period, for example during an internship, they will not have the occasion to understand the complex network of personal relationships that influence how an organization really works.

### **Analysis of pre-workshop level of advanced social skills**

We verified this first hypothesis by measuring the initial (pre-workshop) level of advanced social skills in the workplace of all students in the English-speaking section of one French State School, the Lycee François Premier in Fontainebleau, France, which is the equivalent of an American high school. The students range in age from 14 – 17, and are studying for the “Option Internationale du Baccalaureat” (OIB), a French baccalaureate in which English literature and history/geography are taught and examined in English at English A level standard. One of the aims of the section is to facilitate the students’ social and moral development, mutual understanding and tolerance in a multicultural environment.

The pre-workshop survey asks the students’ opinion about 15 different statements using a five point Likert scale (strongly disagree=1, disagree, neutral, agree, strongly agree=5). Fourteen statements are based on the learning objectives of the EIS simulation and one measures their current interest in a business career. In addition, we asked the students to indicate which of the following ten business words used in the EIS simulation they were sure they understood: CEO, cash cow, acquisition, Executive Information System, memorandum, covert lobbying, pilot test, task force, social network and directive. We also collected their name, sex and school year. The students’ teachers administered the survey during class in November 2007. Out of 116 students we received 108 completed pre-workshop surveys, a response rate of 93%. The sample consisted of 61 females and 47 males. The breakdown by Lycee year was 41 in “Seconde” (14-15 years old), 35 in “Premiere” (15-16 years old) and 32 in “Terminale” (16-17 years old).

The summary statistics for our sample can be found in Table 2. We tested the normality of each item based on skewness and kurtosis tests and found that only three items are normally distributed (q6, q10, q15). Correlation, calculated using the nonparametric Spearman test, among the fifteen items is very low. The highest significant correlations are between following company rules (q5) and obeying the boss (q6), and the two socializing outside work (q3) and during work (q11) items, 0.35 and 0.36 respectively. We also undertook a factor analysis of the fifteen items using a varimax rotation. Only one factor came out of this analysis. However, when we tested the reliability of items loading on this factor using Cronbach’s alpha we could not obtain a value higher than 0.56. Thus all fifteen items are

heterogeneous and measure different underlying properties of the social skills needed in the workplace. We also redid the factor analysis separately for men and women, and for each lycee year, and obtained the same result.

Given that the students in our sample represent more than 20 nationalities, speak at least two languages, and come from a wide range of cultural backgrounds, we believe that these students are not representative of all 14-17 year olds, but are more likely to already have a higher level of social skills and cultural awareness. This can be seen in their very high agreement with the non-work related statement “People react differently to new ideas”. However, it should also be noted that these children have practically no work experience. School and studying takes up most of their time, and unlike the USA, there are few opportunities for students to work part-time in France.

On average the students’ initial understanding of the advanced social skills needed in the workplace is good. Nonetheless, the average student risks falling into several traps; they believe, for example, that people with important titles are influential and that if the solution to a problem is good people will change their working habits. In addition, students are not sure if people will obey their bosses, if it is important to be aware of who socializes at work, and disagree about the power of secretaries. Considering that the range of answers to all items is wide, the standard deviation is high, and their correlation is low, many students could benefit by improving some elements of their social skills in the workplace (see Figure 1). Business vocabulary knowledge is very low, on average students only understood three of the ten words.

TABLE 2: Summary Statistics for All 108 Lycee Students

	mean	median	s.d.	min	max
Q1. The more important your job title, the more people will listen to you	3.6	4	0.99	1	5
Q2. The best way to get someone to change their working habits is to order them to change	2.2	2	0.89	1	4
Q3. It is important to be aware of which people socialize outside work	3.5	4	1.11	1	5
Q4. Some people need lots of convincing in different ways before they will change their working habits	4.1	4	0.71	2	5
Q5. It is important to follow company rules	4.0	4	0.81	1	5
Q6. When their boss is convinced something is the right thing to do, people do it	2.9	3	0.97	1	5
Q7. People react differently to new ideas	4.5	5	0.74	1	5
Q8. Personal relationships are important at work	4.0	4	0.99	1	5
Q9. In a company, all decisions are based on logic and everything is under control	2.6	2	0.94	1	5
Q10. People dislike changing their working habits	3.7	4	0.86	2	5
Q11. At work, it is important to be aware of which people regularly see each other during the day	3.0	3	1.11	1	5
Q12. Secretaries do not have a lot of power at work	2.8	3	0.95	1	5
Q13. If the solution to a problem is good, people will change their working habits	3.4	4	0.88	1	5
Q14. The best way to convince someone to change their working habits is to get to know them better	3.9	4	0.79	1	5
Q15. I am considering a career in business	3.0	3	1.14	1	5
Business vocabulary understanding (number of words out of 10)	3.2	3	2.40	0	10

Interestingly, we found some significant differences between males and females. Males are more likely to be interested in a business career, 25% of males agree while only 10% of females agree. Males also have higher business vocabulary knowledge, a median of four words for males and three words for females. Males were also significantly less likely to disagree that personal relationships are important at work, 10% of females disagreed while only 1% of males disagreed.

Differences also exist between the youngest students in Seconde (14-15 years old) and the older students. The youngest students are less likely to think it is important to be aware of who socializes outside of work and who sees each other during the day, and are more likely to believe that secretaries are powerful. They also have the lowest business vocabulary knowledge with a median of two words.

FIGURE 1: Opinions of 108 young people before the EIS workshop



## **SmallWorld simulations**

Business simulations and games can be defined as experiences that help participants gain awareness of a complex situation by letting them experiment with various solutions to a problem, and by showing them the consequences of their choices (Aldrich, 2005; Faria, 2001). They provide a situated context for learning and encourage participants to try and experiment, while gradually ensuring that they learn something out of it via feedback on their decisions (Rogers, 2003). However, most business simulations are limited to domains in which knowledge can be modeled in quantitative terms, such as finance, economics, and marketing; areas in which a manager's effectiveness ultimately boils down to making decisions based on numbers (Devine, Habig, Martin, Bott & Grayson, 2004; Lainema & Lainema, 2007; Larreche & Gatignon, 1990).

While existing children's computer games like *ROLLERCOASTER TYCOON*, *MALL TYCOON*, and *ZOO TYCOON* do teach valuable quantitative business skills, games like *THE SIMS 2* develop useful social skills such as an awareness of other people's needs in everyday life, and games like *CAMERA CAFE* increase awareness of office politics, these games were created to entertain individuals not to educate them, and more effort has gone into their sophisticated user interfaces rather than their learning dynamics. In contrast, SmallWorld simulations are based on founded research and were created to educate people. They explicitly model the dynamics of relationship and influence networks, and their influence on individual attitudes and behaviors, enabling the learner to validate the impact of several types of interventions on a realistically modeled group of individuals (Angehrn 2006b; Barabasi, 2002; Milgram, 1967, Watts, 2003). SmallWorld simulations are not meant to be played alone, but as part of a team at school or work. The focus of the game is on the underlying learning dynamics which are then exploited in the group discussions and de-briefing session. Thus SmallWorld simulations can provide a realistic playground for young people to help them understand how an organization really works and develop their social skills in a group context.

### **The EIS simulation**

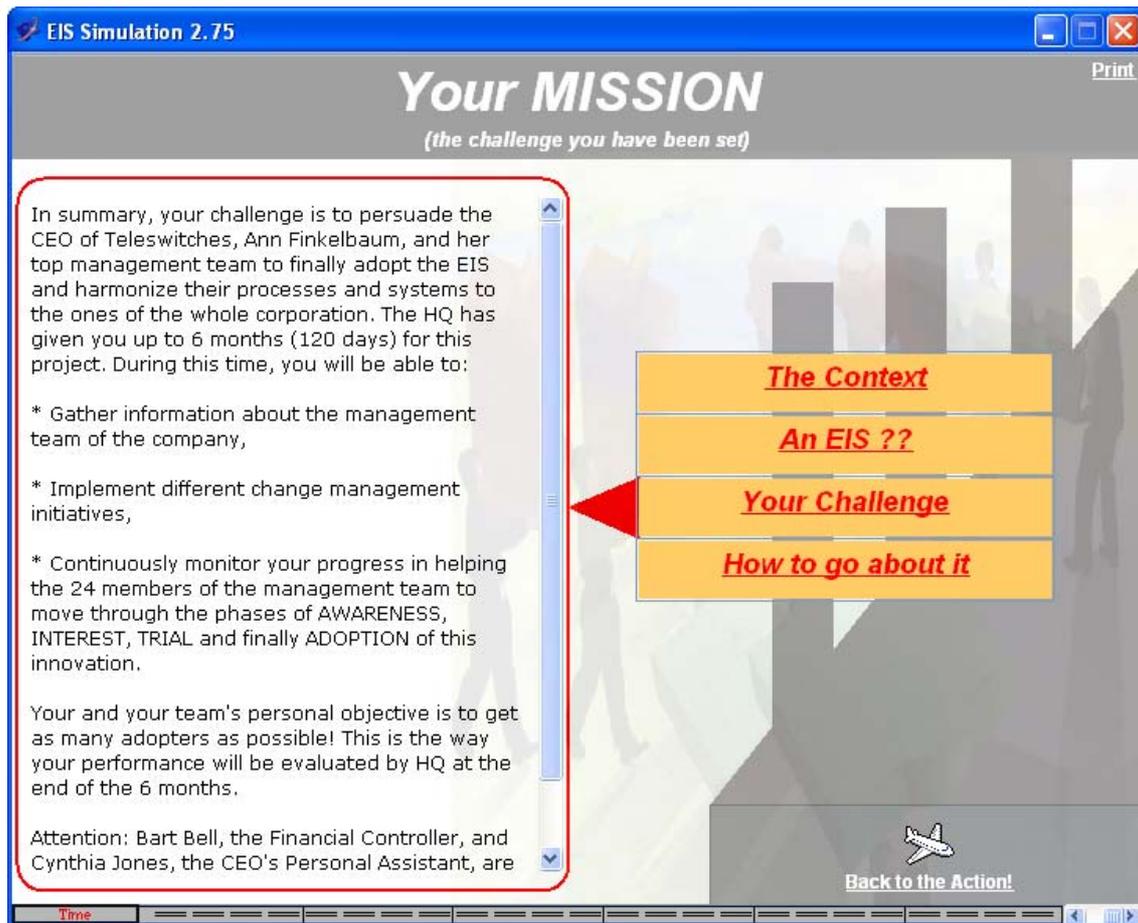
The EIS simulation is a multi-media learning tool developed at INSEAD which simulates employees' resistance to change within a company (Angehrn, 2005; Manzoni & Angehrn, 1997). In the EIS simulation, participants working in small groups are challenged to introduce an innovation in a division of the EuroComm corporation. They have up to 6 months of (simulated) time to convince as many members of the division's management team as possible to adopt a new Executive Information System (EIS) which has been introduced corporate-wide to harmonize information, cost accounting and reporting processes (see Figure 2).

The EIS simulation has been designed as a teamwork experience stimulating collaborative learning and knowledge exchange (Lainema & Lainema, 2007; Nonaka, 1994; Van der Vegt & Bunderson, 2005). Participants not only have to decide what tactics to use on individuals in the simulation, they also have to attempt to convince other members of their team to follow their advice. Teams seem to provide a very good setting for games, as they regroup different users with different experiences and approaches to a given problem. They are especially interesting because they trigger debate and discussion as to how to best solve the current situation, thus making everybody even more engaged in the game scenario.

During the simulation, teams can choose among many different tactics such as arranging meetings with different managers, lobbying, organizing workshops or pilot tests, sending emails, memos or directives, and writing in the company newsletter to meet their goal (see Appendix). They may gather personal information about the managers and their networks

(for instance, who meets on a regular basis at the coffee machine), and take direct action to try to convince the managers to adopt the EIS. Each member of the management team is modeled to have a different “stereotypical” personality, history, and initial attitude towards change and inter-personal communication (see Figure 3). For example, some individuals prefer face-to-face meetings, while others prefer email, some are open to change, and some are not. Each time a team implements an initiative; they receive immediate feedback about the impact of their decision.

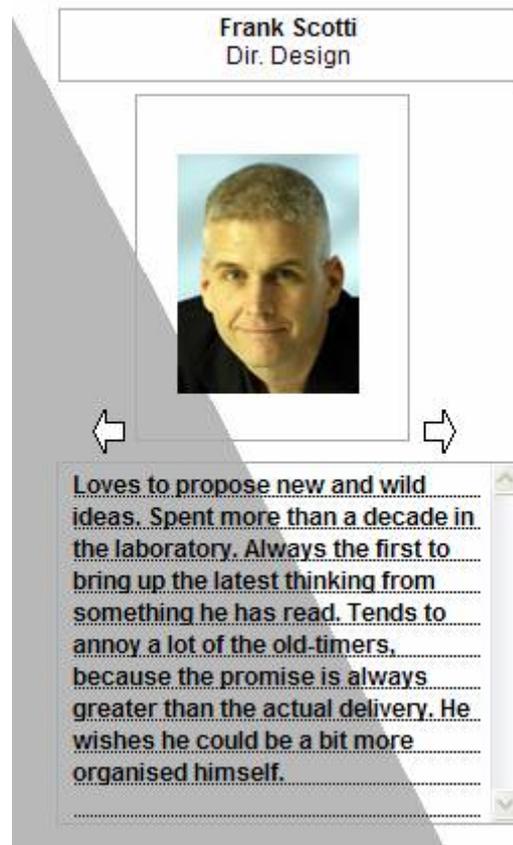
FIGURE 2: Summary of EIS Simulation Scenario



The optimum number of participants in the workshop is approximately 16 students. A computer is needed for each group of three to five students. The installation of the software on each PC takes less than a minute (software available in English, French, Italian, Spanish and Chinese).

This simulation is currently used by adults in change management courses in top universities and large corporations around the world. We hypothesize that this simulation could also be used to help young people better understand the importance of personal relationships in the working world. The EIS simulation can help bridge the gap between school and the world of work by helping students develop their interpersonal skills and social competences in group contexts, becoming aware of the importance of individuals, networks and organizational culture via a fun, and sometimes frustrating, learning-by-doing experience.

FIGURE 3: Example of one character in the EIS Simulation



### Debriefing: Learning objectives of the EIS simulation

Through playing, and then discussing in class their simulation experience, participants should acquire a better general understanding of the importance of personal relationships in the working world, and become aware of the following specific workplace issues:

- the power of formal and informal networks
- people react differently to new ideas
- managers with important titles might not be the most influential
- people who do not appear to be important may be very influential
- the consequences of not following company procedures
- different techniques to influence people and convince them to change.
- the importance of understanding the organization's culture: values, heroes, rites and rituals, informal communication systems, and management style.

and change implementation traps:

- *Optimism trap* – thinking that the necessity to change, and the quality of the selected solution will remove barriers.
- *Illusion of control trap* – forget that change has both intended and unintended consequences.

- *Push though trap* - we all tend to dislike to be changed and are sensitive to who tells us to change – our friends vs. our parents for example.
- *Backfiring trap* – not foresee that resistance might not come only from the “bottom”, but also from the “top”.
- *Narrow focus trap* – only using a few tactics to influence people
- *No follow up trap* – the need to combine several tactics to increase impact
- *Shooting in the dark trap* - before acting, we need to gather information about the “territory” (people, formal/informal networks, culture).
- *Give up trap* - some people need lots of convincing in different ways.
- *Network naivety trap* – fail to acknowledge that efficient diffusion requires in-depth understanding of influence and relationship networks.
- *Get it done quickly trap* – ordering people to do things can have a negative impact on attitude and motivation

There are many other traps in the simulation; these are the ones we think young people could understand and discuss. During the debriefing sessions, the major role of the facilitator is to lead the discussions, and tie the participants’ experiences, to these learning objectives and change implementation traps.

### **The EIS Career Guide workshop experiment**

After completing the pre-workshop survey, all Lycee students were given a flyer advertising the EIS Career Guide workshop. The four hour workshop was held at INSEAD, a business school, on a Saturday afternoon as it was not possible to schedule a four hour class during a normal school day at the Lycee. The first 16 students who returned their permission form received a place at the workshop, and we accepted one additional student bringing the total to 17. The only significant differences, measured using the Mann-Whitney test for numerical variables and the Chi-squared test for categorical variables, between our sample and the rest of the Lycee students are that students in our sample are more interested in a business career, a median of agree (4) vs. neutral (3), and had a slightly higher understanding of business vocabulary, i.e. four words instead of three. It makes sense that students who are more interested in business signed up for the workshop (see Figure 4). There is no significant difference at the 5% level for any of the other variables, including the distributions by school year and sex. Our sample was quite evenly distributed across sex and school year and consisted of eight females and nine males, of which five students were in Seconde (14-15 years old), seven students in Premiere (15-16) and five students in Terminale (16-17).

The actual time use during the EIS Career Guide workshop was as follows:

1. Introduction and discussion of the difficulties of change (20 minutes)
2. EIS simulation scenario and mission (20 minutes)
3. Software demonstration while describing how business are organized, business vocabulary and adoption phases (60 minutes)
4. Coffee break and plan strategy (20 minutes)
5. Play Phase 1 (35 minutes) – in teams of 3-5
6. Debriefing 1: facilitator gets students to talk about their experience so far and relates this to the learning objectives. (15 minutes) - all
7. Play Phase 2 (40 minutes) – in teams of 3-5

8. Debriefing 2: facilitator gets students to talk about their experience and relates this to the learning objectives (25 minutes) - all
9. Post-Workshop Survey (5 minutes)

FIGURE 4: Difference in pre-workshop business career aspirations between full sample and EIS workshop participants



At the end of the workshop, and before leaving the room, all 17 students completed a post-workshop survey (a 100% response rate) which was identical to the pre-workshop survey with the addition of four statements: I enjoyed this workshop. This workshop has increased my understanding of the business world. I felt frustrated playing the simulation. I would have preferred to play the simulation alone. We were particularly interested in measuring the frustration element of the game as we were afraid that children who played the game might get so disillusioned that they might never want to work in a company.

Everyone enjoyed the workshop, and felt that it had increased their understanding of the business world. All students agreed or strongly agreed with these two statements. Contrary to our expectations, most students did not experience frustration during the simulation and actually preferred playing in groups. Only one 15 year old boy would have preferred to play

alone. Interestingly, in their qualitative study of two business game training sessions, Lainema and Lainema (2007) also found to their surprise that none of their adult participants claimed that he/she would have preferred to work alone. Participants clearly stated that team effort was a key to game success.

### **Learning effectiveness results**

Learning was measured by testing the equality of matched pairs of student responses to the 16 common items before and after the workshop using the Wilcoxon matched-pairs signed-rank test. The interval between the pre and post workshop surveys was approximately two weeks. During this time the students did not receive any career guidance information at school, nor were they aware of the real reason we were holding the workshop. As far as they were concerned they were at INSEAD to see what it would be like to be a business school student and to play a management simulation game. Thus we can assume that any change in their opinion was a direct result of the workshop.

Table 3 shows the median and mean values of the fourteen social awareness in the workplace questions, the business vocabulary knowledge of our sample of seventeen 14-17 year old students, and business career interest before and after the EIS Career Guide workshop. We found measurable change for eleven of these items. Firstly, there was a significant increase in the business vocabulary understanding of the students. After the workshop, the average student understood 90% of the words, as opposed to 40% of the words before the workshop. Students were significantly more likely to agree that people dislike changing their working habits. They were also significantly more likely to strongly agree that people react differently to new ideas. Students were significantly likely to agree more that people need to be convinced in different ways to change, that one should be aware of who sees each other during the day both at work and outside of work, and that when their boss is convinced people change. Students were significantly likely to disagree more that it is best to order people to change and that secretaries do not have a lot of power at work. Finally, after the workshop students were significantly less likely to agree that people will change if the solution is good, and that in a company decisions are based on logic and everything is under control (see Figure 5).

There was no significant change for five items. Students already thought that personal relationships are important at work, that the best way to convince someone to change is to get to know them better, and that it is important to follow company rules. There was a shift in job title importance that was not significant because the students changed in different directions: eight students disagree more, four students agree more, and five students did not change their opinion. This may be because we made no distinction between the CEO and the directors in the statement. Students were told during the workshop that if they got the CEO on board everything would be easier, but students also learned that some directors were not very influential. This might also explain why the students think that if their boss is convinced of change, people do it, because they may be equating “boss” with CEO. As a result of this we have now split this question into two items: one about the influence of the CEO, and one about the influence of hierarchical superiors. Finally there was no significant difference in the students’ initial interest in a business career. Most students did not change their initial opinion. Two students are more interested in a business career and moved from neutral to agree. In addition, one moved from disagree to neutral, and one from strongly disagree to disagree. Interestingly, one student who was initially considering a career in business now strongly disagrees. This is the same student who experienced the most frustration during the simulation. Nonetheless, this same student strongly agreed that she enjoyed the workshop and

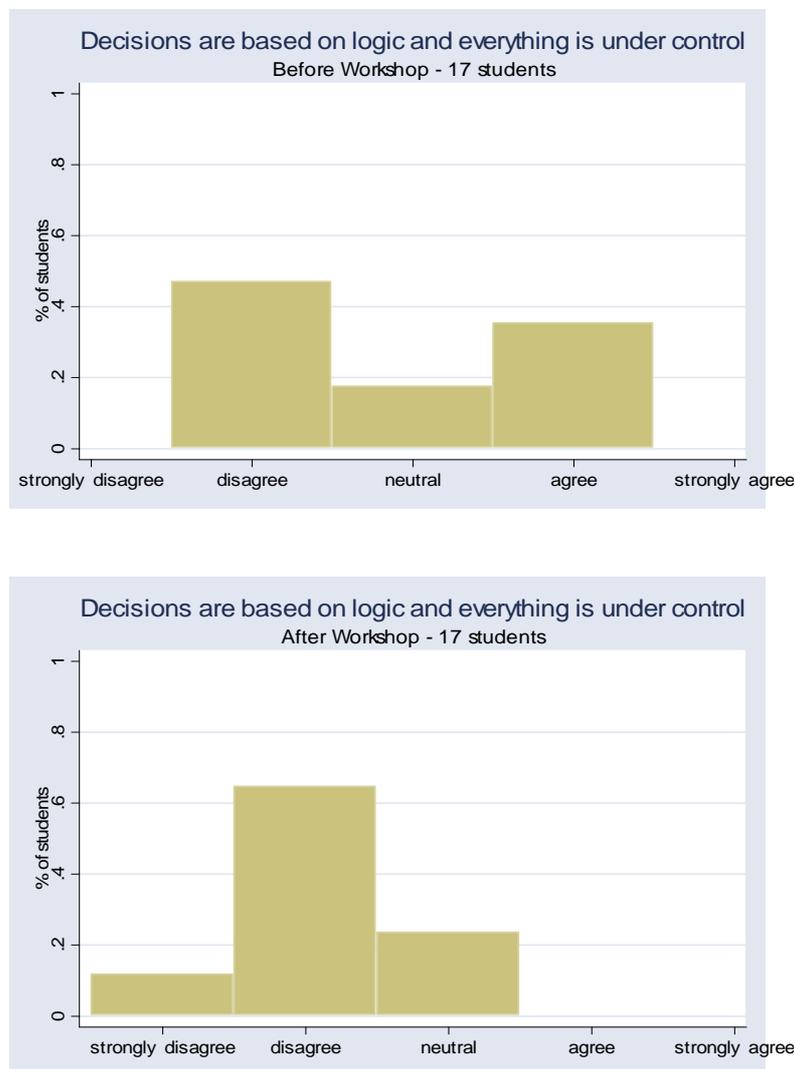
it had increased her understanding of the business world. Thus she benefited from learning that she did not like it.

TABLE 3: Difference of Median and Mean Tests – Pre-workshop vs. Post-workshop

\*Indicates significance at the one percent (\*\*\*), five percent (\*\*) and ten percent (\*) levels, based on the Wilcoxon matched-pairs signed-rank test for medians, and the t-statistic assuming unequal variances for the means.

		Pre-workshop	Post-workshop
Q1. The more important your job title, the more people will listen to you	Mean Median	3.7 4	3.1* 3
Q2. The best way to get someone to change their working habits is to order them to change	Mean Median	2.0 2	1.4*** 1***
Q3. It is important to be aware of which people socialize outside work	Mean Median	3.4 4	4.8*** 5
Q4. Some people need lots of convincing in different ways before they will change their working habits	Mean Median	4.2 4	4.6*** 5***
Q5. It is important to follow company rules	Mean Median	4.2 4	4.1 4
Q6. When their boss is convinced something is the right thing to do, people do it	Mean Median	3.1 3	3.8** 4**
Q7. People react differently to new ideas	Mean Median	4.7 5	4.9** 5**
Q8. Personal relationships are important at work	Mean Median	4.2 4	4.4 4
Q9. In a company, all decisions are based on logic and everything is under control	Mean Median	2.9 3	2.1*** 2**
Q10. People dislike changing their working habits	Mean Median	3.4 4	3.9** 4**
Q11. At work, it is important to be aware of which people regularly see each other during the day	Mean Median	2.9 3	4.4*** 4***
Q12. Secretaries do not have a lot of power at work	Mean Median	2.6 2	1.6*** 2***
Q13. If the solution to a problem is good, people will change their working habits	Mean Median	3.7 4	3*** 3**
Q14. The best way to convince someone to change their working habits is to get to know them better	Mean Median	3.8 4	4.1* 4
Q15. I am considering a career in business	Mean Median	3.8 4	3.8 4
Business vocabulary understanding (number of words out of 10)	Mean Median	4 4	8.8*** 9***

FIGURE 5: Difference in pre and post-workshop opinion about decision making in companies of EIS workshop participants



### Adapting the workshop for schools

During the workshop, we paid particular attention to the students' attention span, to their business language comprehension, and to the comportment of the small groups during the play phases. Surprisingly, as they are used to 50 minute classes at school, the students remained quiet and concentrated during the 100 minutes lecture preceding the play phase. After discussing this with the students, we believe this is probably due to the charisma of the business school professor and the fact that they were awed to be in a business school classroom. The length of the introductory lecture was due to the fact that some things which are obvious for experienced managers, such as how to read an organizational chart and the meaning of each job title, had to be explained to the students. Thus for use in schools, we believe that it would be best to break the lecture up into four shorter lectures which could be shown over the period of several classroom sessions: How Businesses are Organized and Business Vocabulary (20 minutes), Discussion of the Difficulties of Change and Adoption Phases (20 minutes), EIS Simulation Scenario and Mission (20 minutes), and Software

Demonstration (20 minutes). We plan to make videos of these lectures available. We are also writing teaching notes to help teachers run the discussion and debriefing sessions. Although the EIS simulation itself does not require any special adaptation we believe that “*Office Politics: The Games Adults Play at Work*” would be a more appealing name.

It was interesting to observe the student groups’ comportment during the play phases. As we usually do with managers, we deliberately made groups as diverse as possible mixing sex and age. However, in two of the groups, an older boy took over the computer and started making decisions as if he were playing a video game without any great thought or consultation with other group members. We also observed female members making very valid points and being ignored by the boy controlling the keyboard. Our observations concur with the research of Gros (2007) who observed that gender differences influence different lines of play. He found that, in the SIMS and RESTAURANT EMPIRE games, girls spent more time in the design phase whereas all the boys were impatient to begin the simulations. Because of this, it appears that it might be better to either make groups as similar as possible for this age group, or take the opportunity to make the students aware that this might happen, and invite them to actively avoid it.

### **Conclusions**

Most young people considering a business career do not really know what being a manager in a large company means. Even if they have the opportunity to work in a company for a short period, they will probably not have the occasion to understand the complex network of personal relationships that influence how an organization really works. In addition, young people, many of whom play computer games on a daily basis, should be highly receptive to a computer enhanced approach to learning about effective social interaction in an organizational context, such as that found in the EIS simulation workshop described in this paper. To validate these two hypotheses we first surveyed all Anglophone students in one French Lycee (14-17 years old) in order to measure their current knowledge of advanced social skills in the workplace, and found that many students could benefit by improving some of these skills. We then held an EIS simulation workshop for a group of these students and measured its effectiveness on their learning. While the EIS simulation was originally developed for experienced managers, initial results from our research show a significant measurable increase in young peoples’ awareness of many advanced social skills in the workplace, and business vocabulary comprehension. In order to test this further, we plan to expand our sample by making the simulation, lecture videos and teaching notes available to schools in other countries in exchange for pre and post workshop data.

### **References**

- Aldrich, C. (2005). Learning by Doing: A comprehensive guide to simulations, computer games and pedagogy. *E-Learning and Other Educational Experiences*, Jossey-Bass.
- Angehrn, A.A. (2005). Learning to manage innovation and change through organizational and people dynamic simulations. *Proceedings of the International Simulation and Gaming Association Conference (ISAGA 05)*, Atlanta, USA.
- Angehrn, A.A. (2006a). L2C: Designing simulation-based learning experiences for collaboration competencies development. *Proceedings of the 13th International Conference of the Association for Learning Technology (ALT-C 2006)*, Edinburgh, Scotland.

- Angehrn, A.A. (2006b). Designing SmallWorld simulations: Experiences and developments. *The 6th IEEE International Conference on Advanced Learning Technologies (ICALT 2006)*.
- Barabasi, A.-L. (2002). *Linked: The new science of networks*. Cambridge, Mass: Perseus Publ.
- CAMERA CAFE. Indie Games Productions (2005). Dardilly, France : Nobilis (46-48 Chemin de la Bruyère, Bat. A, 69570 Dardilly, France).
- Devine, D.J., Habig, J.K., Martin, K.E., Bott, J.P. & Grayson, A.L. (2004). Tinsel Town: A top management simulation involving distributed expertise. *Simulation & Gaming: An Interdisciplinary Journal*, 35(1), 94-134.
- EIS. Angehrn, A.A (2007). Chartrettes, France : AlphaLabs (48-50 avenue Gallieni, 77590 Chartrettes, France).
- Faria, A.J. (2001). The changing nature of business simulation/gaming research: A brief history. *Simulation & Gaming*, Vol. 32, No. 1, pp. 97-110.
- Gilbert, N. (1993). *Computer simulation of social processes*. Social Research Update, 6.
- Gros, B. (2007). Digital games in education: The design of games-based learning environments. *Journal of Research on Technology in Education*, 40(1), 23-38.
- INSEAD, Ellinogermaniki Agogi, Orientum, Alba, Technical University of Dresden, University of Louis Pasteur, Technical University of Sofia, IPA S.A., Alpha-Omega Communications & Newman College of Higher Education (2007), *An overview of the tools, systems and games used to support career guidance in Europe*, Socrates Programme Comenius 3 (Comenius Networks) 225936 -CP -1-2005-1- GR - COMENIUS-C3P, March 2007.
- Lainema, T. & Lainema, K. (2007). Advancing acquisition of business know-how: Critical learning elements. *Journal of Research on Technology in Education*, 40(2), 183-198.
- Larreche, J.C. & Gatignon, H. (1990). *MARKSTRAT2*. Redwood City, CA: Scientific Press.
- MALL TYCOON. Holistic Design (2002). New York, NY: Take Two Interactive (622 Broadway, New York, NY 10012, USA).
- Manzoni, J.F. & Angehrn, A.A (1997). Understanding organizational dynamics of IT-enabled change: A multimedia simulation approach. *Journal of Management Information Systems*, 14, 3, 109-140.
- Milgram, S. (1967). The small world problem. *Psychology Today*, 1(1), 60-67.
- Moll, L.C. (1990). *Vygotsky and education – Instructional implications and applications of sociohistorical psychology*. Cambridge University Press.
- Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science*, 5(1), 14-37.
- Pfeffer, J. & Sutton, R. (2000). *The knowing-going gap: How smart companies turn knowledge into action*. San Francisco: Berrett-Koehler Publications.
- RESTAURANT EMPIRE. Enlight Software (2003). Dardilly, France : Nobilis (46-48 Chemin de la Bruyère, Bat. A, 69570 Dardilly, France).
- Rogers, E.M. (2003). *Diffusion of innovations* (5th ed.). Free Press, New York, NY.

- ROLLERCOASTER TYCOON. MicroProse Software (1999). Paris, France: Ubisoft (Austerlitz 2000, 173-179 rue du Chevaleret, 75646 Paris Cedex 13, France).
- Salen, K. & Zimmerman, E. (2003). *Rules of play: Game design fundamentals*. MIT Press.
- SIMS 2, The. Wright, W. (2000). Redwood City, CA: Electronic Arts (209 Redwood Shores Parkway, Redwood City, CA 94065, USA).
- Van der Vegt, G.S. & Bunderson, J.S. (2005). Learning and performance in multidisciplinary teams: The importance of collective team identification. *Academy of Management Journal*, 48(3), 532-547.
- Wadsworth, B.J. (1979). *Piaget's theory of cognitive development*, Longmann.
- Watts, D.J. (2003). *Six degrees: The science of a connected age*. New York: Norton.
- Yilmaz, L. & Oren, T. (2003). Towards simulation-based problem solving environments for conflict management in computational social science. *Proceedings of Agent2003: Challenges in Social Simulation*, October.
- ZOO TYCOON. Blue Fang Games (2001). Redmond, WA: Microsoft (One Microsoft Way, Redmond, WA 98052-6399, USA).

## Appendix: EIS Initiatives

**SEEK ADVICE:** Organize a meeting with any one member of the top management team in order to get some advice on how to approach the EIS project in the most effective manner. (2 days) *NOTE* – You will not actually receive advice in the feedback message; the aim is to influence the person you visit by taking the ‘humble’ approach.

**PERSONAL PROFILE:** Build a personal profile on any five members of the top management team by talking informally with your network at EuroComm HQ. (2 days) *NOTE* – Each person’s profile includes a qualitative description of the individual and an indication of how difficult it will be to move that individual through the four change phases.

**TASK FORCES:** Discover which top managers are on the company’s three main task forces. (1 day) *NOTE* – These membership lists will not change, and will remain available throughout the simulation.

**INTERNAL MAGAZINE:** Ask the editor of the internal magazine to include a short article you write on the advantages that Executive Information Systems can bring to managers. (3 days) *NOTE* – This magazine is distributed to all of the top management team. The article is about the generic advantages of EIS, and does not include any company specific information.

**DIRECTIVE:** Try to convince the CEO to send out a directive to everyone in the top management team insisting that they start using the EIS in two weeks’ time. (7 days) *NOTE* – You spend several days writing a draft of this directive to give to the CEO.

**COVERT LOBBYING:** Without the formal approval of the Directors concerned, suggest to a group of selected Managers that they meet the CEO to lobby for the implementation of the EIS. (8 days) *NOTE* – This initiative assumes that you have identified the appropriate Managers to approach, and does not require you to specify them.

**ELECTRONIC MAIL:** Send a brief electronic mail to everyone in the top management team explaining your ideas on why an EIS makes sense for them. (1 day) *NOTE* – All of the top managers have an individual E-mail account.

**MANAGEMENT TRAINING:** For five members of the top management team, organize a week long residential training program at a nearby business school on the potential benefits of an EIS and how to actually use such a system. (5 days) *NOTE* – You do not attend the program, but it takes a considerable amount of your time to plan it.

**DIRECTORS MEETING:** Organize a special interdepartmental meeting in the main conference room with all the five directors and the CEO to share and discuss thoughts and plans for the EIS project. (3 days) *NOTE* – Directors are informed that they can also bring along Managers from their department.

**WORKSHOP:** Help one of the top managers to organize and lead a demonstration and discussion session on EIS for all the top managers interested in the topic. (5 days) *NOTE* – This will provide the opportunity for the workshop leader to share and gather views and experiences on EIS.

**FACE-TO-FACE MEETING:** Fix a meeting with one of the top managers in order to persuade him/her that the EIS would make sense to implement. (1 day) *NOTE* – The meeting will take place in the manager’s office.

**COFFEE BREAK:** Spend some time at the company bar in order to see which groups of top managers meet regularly for a coffee. (3 days) *NOTE* – These groups will not change, and the list will remain available throughout the simulation.

**MEMORANDUM:** Write and send to any five of the top managers a brief memo on how some of the specific features of the EIS will improve transparency of information flows in the company. (1 day) *NOTE* – This is distributed in the company internal mail system.

**PILOT TEST:** Try to get commitment from one of the top managers by asking him/her to organize a two-week-long pilot test of the EIS in his/her department using current company data. (4 days) *NOTE* – This will involve setting up the EIS on all the department's computers and providing users with the appropriate training.

**STAFF MEETING DISCUSSION:** Develop a slide show on the EIS, and present it during the regular weekly top manager's staff meeting. (5 days) *NOTE* – The presentation includes potential applications of the EIS within the different departments. All members of top management are in principle expected to attend these meetings.

**QUESTIONNAIRE:** Write and distribute to all of the top managers a questionnaire aimed at assessing their current level of interest in becoming regular EIS users. (2 days) *NOTE* – The main objective of using this questionnaire is to demonstrate your approach to the project rather than gathering additional information.

**EXTERNAL SPEAKER:** Organize a speaker event in which Professor Tom Petersen, an expert on Executive Information Systems, will deliver an address entitled: "EIS: Liberating Information in the Organization". (5 days)

**NETWORKS:** Spend some time observing or finding out which top managers go together regularly to the company health club, who is involved in the local charity campaign, and who is looking informally at environmental issues together. (5 days) *NOTE* – These groups will not change, and the lists will remain available throughout the simulation.

## Europe Campus

Boulevard de Constance,  
77305 Fontainebleau Cedex, France

Tel: +33 (0)1 6072 40 00

Fax: +33 (0)1 60 74 00/01

## Asia Campus

1 Ayer Rajah Avenue, Singapore 138676

Tel: +65 67 99 53 88

Fax: +65 67 99 53 99

[www.insead.edu](http://www.insead.edu)

**INSEAD**

The Business School  
for the World