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Engaging Students in an MIS Course through the Creation of e-Businesses: A Self Determination Theory Analysis

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Abstract

We describe an entrepreneurial approach for teaching a Management Information Systems (MIS) course. The course builds on the psychological needs for autonomy, competence and relatedness to encourage student motivation and engagement. Students are required to create new electronic businesses and to build prototypes of their electronic web fronts. Students are also required to use the concepts taught in the course and to analyze the ventures' strategies, related network externalities, as well as business processes and data analytics. The course was taught since 2009 to five classes with more than two hundred students. Using student evaluation questionnaires and four detailed interviews, we find that more than half of the students are enthusiastic about the new approach, feeling satisfied and even proud of their projects. However, a minority of students found the course over-complicated and even boring. We found also that students who expressed autonomy orientation engaged with the course, while students who expressed impersonal or controlled orientation did not. We believe that this analysis should help instructors in aligning new teaching opportunities created by IT to fit students' orientations and needs.

Keywords: information systems, education, curricula

I. Introduction

The Management of Information Systems (MIS) is challenging to teach in a business school context because of a mismatch between the curricula and the needs of the business community. These types of courses are usually quite technically focused, while employers seek graduates with a mixture of both enterprise or business knowhow and technological knowledge. In addition, the continuous technological change and the rapid evolution of business experiences relating to IT often render the technical focus outdated. A further difficulty is the fact that IT and business taught as a subject area is interdisciplinary by nature thus making it difficult to delineate its core insights [Dhar and Sundararajan 2007]. An important reflection of these difficulties is a reduction in student enrolment in MIS programs, and the merging of MIS courses and programs into other business school areas [Gefen et al. 2012]. As a result, several attempts to reengineer MIS curricula have been reported [Austin et al. 2009; Aitken and Hatt 2012; Whelan and Firth 2012], experimenting with new approaches to tie business and technology perspectives together.

The current paper describes and analyzes a Management Information Technology course for MBA students aimed at achieving student engagement, relevance and conceptual anchoring. We have developed and taught this course at the largest business school in Israel, leveraging the country's entrepreneurial culture [Senor and Singer 2009] to create relevance through student electronic business innovation. At the same time, the course is designed to incorporate theory-based concepts of technology and business, including ideas from economics, strategic management, decision science and sociology, in order to create enduring knowledge assets. This approach shares many of the principles reported by Austin et al. [2009] including design for student engagement, emphasis on business aspects of IT and the identification of a set of core issues essential to IT management. However, the two courses differ: Austin et al.'s [2009] hero's journey from a business executive to a Chief Information Officer is designed for student derivation of management frameworks; our course focuses on a predefined set of managerial concepts of technology. Also, while Austin et al.'s [2009] course is technology independent, we leverage

the consumerization of IT [Economist, 2011] and von Hippel's [2006] ideas about the democratizing of innovation to create business and technology connection as well as student engagement.

The objectives of this paper are to (1) present a novel approach to teaching Management Information Systems in a business school setting with the expectation that others can use it as a model for their own course development and (2) analyze the effectiveness of this approach in engaging students and achieving learning objectives. The analysis is of interest because technology enables a variety of opportunities for student-centred learning and the particular case described should help in understanding under which circumstances such courses may be successful or for which students such courses are effective.

The analysis is guided by Self Determination Theory (SDT) [Deci and Ryan 2012] which focuses on the satisfaction of the basic psychological needs of autonomy, competence and relatedness for achieving motivation. These basic psychological needs are highly relevant to the approach of teaching through ideation and innovation. A mixed methods analytical approach was used including a cluster analysis of student evaluation questionnaires and qualitative analysis of interviews with four students.

The paper continues with the theory section outlining SDT, a description of the course (delivery, technological tools used and electronic businesses suggested by students), the analysis section (quantitative and qualitative), and a discussion of the results.

II. Theory

Student Engagement and Motivation

The objective of the newly designed course was to enhance student engagement through student-centred learning. Student engagement is described as "*participation in educationally effective practices, both inside and outside the classroom*" [Harper & Quaye 2008, p. 2]. These effective educational practices could be experienced as a combination of "*student-faculty contact, cooperation among students, active learning, prompt feedback, time on task, high expectations, and respect for diverse talents and ways of learning*" [Kuh et al. 2007, p. 43]. The course was designed to include quite a few of these underlying cues for effective educational engagement such as on-going faculty-student discussions of the feasibility and value of the new electronic businesses, often before or after the formal lectures, active learning through engagement in a practical task and respecting diverse talents through engaging in group work. These types of engagement are also central to the precepts of student-centred learning, described as:

"ways of thinking about teaching and learning that emphasize student responsibility and activity in learning rather than content or what the teachers are doing...[it] has student responsibility and activity at its heart, in contrast to a strong emphasis on teacher control and coverage of academic content in much conventional, didactic teaching." [Cannon & Newble 2000, pp. 16-17, authors' own emphasis].

At the heart of student-centred approaches to learning is engendering student motivation [Maclellan 2008] which is further seen as dependent on the context in which the learning occurs [Schunk et al. 2012]. Thus, a context that emphasizes performance goals (external influences to succeed) may be more inclined to inhibit motivation as opposed to one which encourages mastering an activity (internal influences to succeed) [Maclellan 2008; Schunk et al. 2012]. The social environment of learning has also been linked to the development of a sense of interest and volition in a student and consequently higher achievement [Krapp 1999; Deci et al. 1991]. Such accomplishment is further linked by some authors to the student's ability to value their work and regulate their learning behaviours [Black & Deci 2000; Schunk et al 2012; Vansteenkiste et al. 2004; Pintrich 2004]. Some of these studies are based on a theoretical perspective about motivation known as Self Determination Theory (SDT) which will be adopted as a guiding conceptual position in this paper.

Self Determination Theory

Self Determination Theory (SDT) is a theory of human motivation and personality. The theory should prove useful in evaluating the outcomes of a course designed around entrepreneurial self-developed

electronic businesses because its most important conceptual distinction is between “autonomous” and “controlled” motivation [Deci and Ryan 2008, p. 422]. Briefly, autonomous motivation is related to the extent to which an individual is internally driven to accomplish a task, while controlled motivation is linked to external influences on accomplishing a task which are unassimilated/non-internalised by the individual. SDT maintains that whether a person’s motivation is more autonomous or more controlled predicts the quality of their engagement and performance better than predictions based on the intensity of the motivation [Deci and Ryan 2012, p. 86]. SDT research supports these predictions in a variety of circumstances, including educational contexts [Benware & Deci 1984; Black & Deci 2000; Deci et al. 1991]. When college students learn under autonomous motivation, their learning tends to be deeper and more conceptual and they tend to remember it longer, than when the motivation to learn is more controlled [Benware and Deci 1984, Vansteenskiste et al. 2004]. The following presents a more in-depth review of the background to SDT which will help to frame and contextualize these assumptions. At the heart of SDT is the assertion that competence, relatedness and autonomy are basic psychological needs held by all individuals, which when satisfied lead to a sense of well-being and achievement:

“We have posited that people require three specific psychological nutrients for healthy functioning: They need to feel competent in negotiating their external and internal environments; they need to experience relatedness to other people and groups; and they need to feel autonomy or self-determination with respect to their own behaviours and lives. [Deci and Ryan 2012, p. 87]”

Competence refers to an individual’s experience of having the confidence to pursue and effectively master activities in their environment [Deci and Ryan 2000; Sheldon et al. 2001]. Niemiec and Ryan [2009] relate competence in a higher education learning environment to the actions that lead students to believe they are capable of meeting the challenges of their coursework. Relatedness refers to having a sense of connectedness and belonging to groups which share the same values, norms and practices as one’s own belief system [Deci et al., 1991; Sheldon et al. 2001]. In a learning environment, relatedness is associated with a student feeling valued by their teachers, of having the experience that their instructors or peers genuinely like, respect, and value them [Niemiec and Ryan 2009]. Finally, autonomy or self-determination refers to the concept that one’s own actions are, as a result of one’s own choices (agency), totally congruent to one’s own internalised values. To experience autonomy means to experience a sense of integrity and self-regulation in activities in which one engages [Deci and Ryan 2000; 2012]. This may be realized, for example, when students willingly devote time and energy to their studies [Niemiec and Ryan 2009].

SDT further aligns the fulfilment of the basic psychological needs of autonomy, competence and relatedness with motivation and goals [Deci and Ryan 2012]. In this vein, the authors define intrinsic motivation as engaging with an activity because it is perceived as interesting and enjoyable; these satisfactions derive primarily from experiences of competence and autonomy, and in some cases from relatedness (ibid.). As an illustration, Deci and Ryan [2012, p. 88] relate:

“One typically delightful example of intrinsically motivated behaviour is children playing. In play children are often wholly absorbed in activities, experiencing a sense of interest and joy as they manipulate objects and explore their environments. As this occurs, their basic psychological needs for competence and autonomy are being met, as they self-organize their actions and experience effectance [competence]”

Extrinsic motivation, on the other hand refers to being externally influenced by rewards or punishments to regulate one’s behaviour [Deci and Ryan 2012]. Extrinsic motivation is associated with lack of, or varying levels of autonomy [Ryan and Deci 2000]. The degree to which extrinsic motivation may affect autonomy (in the sense of the individual endorsing the activity) is related to another SDT concept, that of internalization. One form of internalization is achieved when people adopt values or practices from their environment and are motivated to maintain these values to avoid self-censure or guilt [Deci and Ryan 2012]. But, internalization can also occur when people identify with an external value and accept it as their own or further, integrate and identify these external influences with other aspects of their core values and practices. Research has shown that those more autonomous types of internalization (e.g. associating with one’s own values) are associated with more engagement in work or coursework,

perceived competence and deeper conceptual learning [Deci and Ryan 2012]. Thus instructors' strategies for learning and teaching should be geared towards increasing the opportunities for more autonomous motivation experiences in their student cohorts.

In the classroom, autonomy can be supported by minimizing the importance of external measures of performance (i.e. controlling environments) and by maximizing students' perceptions of having choice and influence over those learning activities in which they are engaged [Niemiec and Ryan 2009]. This is referred to as autonomy support and is achieved when the perspectives of the individual are taken into consideration, they are encouraged to explore, take chances and initiatives and they are furthermore provided with some choice as to activities in which they will engage; in these situations, the use of control or external regulation is minimized [Deci and Ryan 2012]. Autonomy supportive contexts satisfy not only the basic psychological need for autonomy but to some degree, the other needs of competence and relatedness. When an authority figure, such as an instructor, takes into consideration a child's or student's perspective, this provides the need to be related to and allows the person in authority to encourage the individual to do what is necessary to satisfy their other needs [Deci and Ryan 2012].

Finally, while much of SDT considers the socio-contextual factors that influence motivation such as the autonomy supporting environments vs. controlling environments, it also studies differences between individuals at a personal level to determine if motivation is affected by personality variations [Deci and Ryan 2012]. In this vein, the authors define three personality orientations – autonomous, controlled and impersonal. Autonomy orientation is defined as the degree to which people tend to be inherently autonomous in their behaviour. That is, they tend to interpret their environments as supportive of their autonomy needs and informational regarding their potential choices; in general, they will tend to behave out of interest and according to their values. A person with a controlled orientation will tend to interpret their environment as demanding and pressurizing; in general, they are focused on rewards and punishments and regulate their behaviour accordingly. Finally, the impersonal orientation refers to a sense of being unmotivated or having little influence over outcomes (lack of agency); the environment is seen as being an encumbrance and impediment to personal development. Research into these orientations has shown that autonomy orientation is associated with self-actualization, self-esteem and ego-development; controlled orientation is associated with public self-consciousness, competitiveness and aggressiveness; while impersonal orientation is associated with anxiety and depressive symptoms [Deci and Ryan 2012]. SDT posits that people will exhibit to some degree all three of these orientations; one orientation may be dominant, however, other orientations become dominant because factors in the environment stimulate specific orientations [Deci and Ryan 2012].

III. The Course

Delivery

The course was designed to engage students by creating a setting that resembled the Israeli high technology cluster. Association with this small but internationally successful part of the otherwise lagging Israeli economy is highly sought after [Senor and Singer 2009]. Students were asked to self-organize into groups of either three or four members, similar to the self-selection of startup founders (reflecting the SDT need for autonomy). Then, each group was asked to create a new business idea, preferably one that reflects their professional knowhow (reflecting competence). Groups were required to present their initial ideas to the class to receive feedback from other students and the lecturers. This procedure resembled the popular perceptions of ideation and evaluation in the high tech cluster (relatedness). Groups were then required to create electronic prototypes of the business ideas and to analyze their value and operational principles using the conceptual frameworks presented in lectures. Finally, groups presented their businesses to gain 'agreement to invest' either from the class and lecturers, or from a small panel of industry experts.

The creation of new business ideas by the students was intended to create a sense of ownership and autonomy. Students were directed to select a business sector they knew well. Since the course was developed for MBA classes in which students were in their mid to late twenties, almost all students had professional experience. So, students were asked to consider their own profession for opportunities to

create value and reduce transaction costs through new electronic, mobile or social media channels. Often this worked well. For example, a student working for a large investment house explained that a specific type of financial product was not traded in the Israeli exchange, but was still required by companies and often traded inefficiently. The idea to create a new specific electronic market was analyzed in class and the group then created a pilot web site for this electronic market. In a sense, the course aimed to translate students' domain expertise or competence into a new skill of analyzing the value and operation principles of information technology in their domain. However, some groups preferred not to dwell on their employment experience and chose to develop ideas related to their behaviour as consumers. Often, this happened when students had advanced specific needs and operated as lead users [von Hippel 1999]. For example, one group (of female students) created a Facebook-based service to share experiences of fashion enthusiasts; this type of service was new to Israel at the time, early 2011. They succeeded in convincing the class and a sceptical (male) lecturer that the business would be profitable by presenting a return on investment calculation based on affiliate marketing.

The analysis of the business ideas was done through a dialogue in class and out of class between the student groups and the lecturers. The idea was that the lecturers were the 'owners' of the conceptual frameworks presented in class. Similarly, the students were the owners of the business idea and often of a specific domain expertise. The dialogue fulfilled both relatedness and competence needs and created iterations of ideation and analysis. The students suggested an idea and some domain knowledge that supported it. Then, the students were required to analyze their idea with one or more of the conceptual frameworks taught in class. The lecturer then questioned some of the detailed application of the framework to the specific domain and business idea. The result was sometimes a better analysis of the business idea, but sometimes the refinement of the business idea, or even abandoning the original idea and suggesting a 'better idea'. An example of refining the business idea was a discussion about the detail of the main business process in a network of small scale suppliers of ethnic food. Should the network operator provide delivery services? What are the costs of including such services? What are the risks in not providing them? Through the interaction of this dialogue, students would gain feedback on the salience of their projects from the point of view of the conceptual frameworks and better understanding of the frameworks.

The interaction was not confined to a student-instructor exchange. The ideation process required interaction between group members because of the open-ended nature of the task. In some of the groups, a single domain-expert emerged and much of the interaction centred on him or her. However, our impression was that at least the first stages of the ideation process involved all or almost all members of most groups. A third level of interaction was in class between the group presenting an idea/analysis and other students of the class. This type of interaction was intensive when either the business ideas were relevant to consumers, or when several students shared a specific domain expertise, for example when many of the students were lawyers. A final level of interactions between students was related to the development of the web sites. During many discussions and presentations students shared experiences on how to use the tools. Often, the inclusion of Hebrew text (written from right to left) in various contexts was non-trivial and was discussed between students.

The process of ideation, analysis, feedback and iteration was the backbone of the course. However, the course aimed also at creating actual technological artefacts as prototypes for the new businesses. We aimed at three types of artefacts as follows: 1) an electronic web front of the business, such as web site, mobile application or Facebook pages; 2) the definition of the business' major processes, in particular those that involve customers and suppliers; 3) some simple automatic decision rules, or data analytics, to support decisions of the new business and exemplify Business Intelligence. The goal was to provide students with both conceptual and technological tools for creating these Information Technology artefacts and to create a sense of new competency. As the students were MBAs, usually with no technical background, the technological tools we selected were simple and provided only an initial demonstration of the technological opportunities. Namely, the goals were to give the students some initial experience in creating web pages or Facebook communities, but we did not aim to develop full blown skill in developing web sites, automated processes or analytics.

Concepts

The first part of the course was intended to teach students how to think systematically about the strategic and economic aspects of technology. We started with a brief summary of strategic management, including mission, vision, objectives, business strategy and Porter's five forces of competition [Thompson and Strickland 2010; chapters 2 and 3). A strategic planning course was a prerequisite for the MIS course, so we briefly summarized the ideas and used them to describe and analyze a project that students created in one of our previous courses. We discussed in more detail McFarlan's questions about the strategic value of technology [Applegate et al. 2009], using American Airline's Sabre as the classic case. Because we emphasized current relevance of the ideas, we supplemented the American Airlines case with high frequency trading of equities as an example of how technology changes the basis of competition nowadays. The third subject in this part of the course was the Economics of Technology. We introduced Transaction Costs Economics (TCE) and reviewed very briefly the ideas of Coase and Williamson [Tadelis and Williamson 2012]. TCE was then used to discuss in detail the electronic markets hypothesis [Malone 1989] and some recent empirical evidence on structure and prices in electronic markets [Goldmanis et al. 2010; Baye et al. 2004]. Then we discussed network effects and switching costs [Shapiro and Varian 1999]. The concepts were exemplified with several e-commerce role models, including Google [Iyer and Davenport 2008] Amazon [Bezos et al. 2007] and eBay.

Students were required to use these concepts while forming their businesses. Specifically, they were asked about the transaction costs in their domain and how they used various technologies – for example, video – to reduce these costs. If network effects were relevant, they were asked to explain how they would achieve them and roughly at what cost, using Google's AdSense to assess costs of an internet marketing campaign. The first part of the course was concluded, in Week 5 or 6, with initial presentations of the electronic businesses. These presentations were not graded; they were used to create a dialogue, or relate, the 'entrepreneurs' of each project and the rest of the class. Students were required to alter their business strategy following the feedback in these sessions. Often, businesses were changed quite dramatically.

The second part of the course took an operational perspective of business technologies. The first operational framework was business process management; the focus was on the wider managerial concepts – Hammer's [1999, 2007] reasoning about enterprise-wide processes, process owners, enterprise-wide performance measures, and systematic improvement of processes. Enterprise systems, including ERP, CRM and SCM were then presented as enablers for the process management approach. In addition, we presented technological and organizational change in this context [McAfee and Brynjolfsson 2008], using the debate about cloud computing [Iyer and Henderson, 2010] as an example. The second operational perspective was decision making, again starting with a wider discussion about rational and behavioral models [Kahneman 2003], and then discussing organizational decision making and Business Intelligence [Applegate et al. 2008; Davenport 2006]. The third and final aspect was sociological, starting with technological and social determinism and the socio-technical theory [Grint 2005; Chapter 8) and then discussing Structuration Theory and its practical implication on IT usage patterns [Orlikowski 2000]. The lectures in this course were concluded with a wider discussion of IT management, following Weill and Ross [2009]. We demonstrated the concepts in this part of the course with several East-Asian case studies, in order to increase awareness of the global nature of our discussion (with Israeli students who usually focus on the US). The examples included productivity of mobile phones in rural India [Jensen 2007], the interaction of technology and social prejudice to unbalance male and female births [Economist 2010], and empowerment of workers at Seven-Eleven Japan [Weill and Ross 2009].

The students were required to address these IT related operational concepts in their projects. At a minimum, students were required to construct the main supplier- and customer-related business processes, and to discuss data needs and decision making in their businesses. Extra points were given when social aspects were discussed. The final two classes were devoted to students' presentations of their businesses. Industrial panels helped us grade the presentations. The panels included two or three e-commerce experts who shared their experiences and expressed their willingness, or otherwise, to

consider investment in the students' projects. An outline of the weekly course topics and supporting case studies is given in Table 1.

Table 1. Course Outline		
Week	Concepts	Cases/Examples
1	Outline of the course	A students' e-business (from an earlier course)
2	Summary of Strategic Management Strategic Value of Technology	American Airlines High Frequency Trading
3	Transaction Cost Economics The Electronic Markets Hypothesis	Structure and prices at Travel Agencies, Bookstores and Car Dealerships (2010)
4	Economics of Technology: Switching Costs and Network Externalities	Google, Amazon, eBay
5-6	Initial e-business presentations and class feedback	
7	Business Process Management Enterprise Systems	CVS Caremark
8	Rational & Behavioral Decision Making Business Intelligence	Mobile Phones at Kerala Fisheries Marriot International
9	Socio-Technical Theory Structuration	South Asia Gender Unbalance Lotus Notes at 'Alpha'
10	IT Management	Seven Eleven Japan
11-12	Final e-business presentations to an industrial expert panel	

Tools

Our success in this aspect of the course was only partial. We had experimented with several web authoring packages, including OS Commerce, Google Sites, Wix, and Weebly. All provided drag and drop tools to create web-sites; students found them easy enough for creating the required sites. We advised students to use either the Weebly free website authoring tool or Wix, a free Flash website builder, for more advanced students. For business processes, we experimented with Business One, a small business ERP solution from SAP. Although the package was intuitive and very easy to use we did not recommend it for the later instances of the course delivery. The reason was the difficulty in integrating data from the web site (for example, customer contact information) with Business One forms and processes. It probably reflected a difference in technological style; Business One is an enterprise-wide *application* but not a native web-based solution. We planned to use Salesforce web-based CRM for the operational artifacts of the course; it was easy to integrate data from web sites into Salesforce. As for decision-making and Business Intelligence, we had experimented with Google Analytics on the traffic to the projects' web-sites; however, the traffic was so small, that the decision rules and related analysis seemed meaningless. We are still looking for ideas on how to create an actual demonstration of Business Intelligence in our context, for example by creating more traffic to the web sites and then analyzing it.

Electronic Businesses

We started teaching this course during 2009 and by the 2011 Spring Semester we had taught five classes with more than two hundred students and many dozens of electronic businesses. Indeed, these businesses reflected our aim to achieve continuous relevance. All the first semester projects were internet-based; many business ideas during the 2011 semesters were mobile applications and some projects were based on social networks. The quality of business ideas varied widely; however, even the more mundane ideas were useful in the application and analysis of the course's concepts.

In order to illustrate the type and quality of business ideas, the following four projects are some of the best suggested by the five classes we taught during 2010 and 2011:

Business Idea 1. *An electronic market for home-cooked ethnic food.* The four students were led by a student who was then self-employed as a producer of events and parties. The group suggested creating a network of housewives skilled at home cooking of ethnic food, typically from the less prosperous suburbs of Tel-Aviv. The other side of the suggested market were affluent technology savvy young professionals. The group showed that Internet-based purchases of food grew rapidly, while the

specific service they proposed had not yet been available in Israel. Given the nature of this business idea, there were many short discussions in class about it, and specifically about service quality. An important realization was that the delivery process was critical and should probably be organized by the new venture. The group's final business plan specified two models of delivery – outsourcing and in-sourcing and discussed their feasibility. The business plan used also ideas about transaction costs and network effects to analyze the two sides of the market. For example, they discussed the reputation mechanism for the meal suppliers and the social network aspects for the customers.

Business Idea 2. *An electronic marketing service for law offices.* Three students, working as lawyers, explained in class that the Israeli bar association had allowed electronic marketing of law offices, just three months earlier. At the time, there were already about 3,000 law offices' web sites. The group expected that many more of the 45,000 or so Israeli lawyers would create web sites, social media pages and mobile applications to market their services. However, there were only a few and mostly small companies catering for the marketing needs of law offices. The group explained that marketing legal services was governed by strict rules about content and media. They suggested creating a business that would provide compliance services. These could be performed semi-automatically and would be used as an entry strategy into this emerging sector. Using ideas about the economics of IT, they suggested a freemium revenue model. Basic compliance alerts would be free, while full compliance monitoring, search engine optimization, site and social network construction would be charged.

Business Idea 3. *An Israeli Fashion sharing social network.* A group of students employed by ad agencies suggested creating a Facebook-based business aiming at young women in Israel who wish to share their experience related to fashion. There was an ongoing discussion about the commercial viability of such a venture. The lecturer and some of the other students doubted that large fashion chains would cooperate. If this is so easy, why would the fashion chains not create such a network themselves? The entrepreneurs answered these doubts by demonstrating the limits of Internet marketing efforts by the major fashion chains in Israel. They succeeded in convincing us that the large chains will not cater for the community aspect of fashion, and if they succeed in creating a large enough electronic community, their business would be viable. They created quickly some traffic in their Share-Your-Style pages coming from their own friends. They showed that that their costs were minimal, and their expectations of advertisement revenue from the large Israeli chains seemed to be reasonable.

Business Idea 4. *A mobile loyalty application.* Two students who worked as programmers at a large bank suggested a mobile application for small shops to create loyalty programs for the shops' customers. The students showed that it would be very easy to customize an open source CRM package. This would reduce their deployment costs and a minimal initial investment. Using ideas from Transaction Cost Economics they suggested a lock-in mechanism: free of charge subscription for the first year and inexpensive charges for subsequent years. They assumed that some of the shops would appreciate access to data about existing customers and thus would accept this revenue model.

IV. Analysis

Student Evaluation Surveys

The college surveys students at the end of each semester about their course evaluations. These are voluntary internet surveys that include eleven questions about each course. They cover general impressions about the course and lecturer, acquired knowledge, assignments, teaching assistant, learning portal, and classroom.

Table 2 presents a cluster analysis of student evaluation questionnaires of two courses given during the Fall semester 2010/2011. We had two general MBA classes with 54 and 46 students and as much as we could tell the classes were homogenous. Aggregating the 25 and 29 respondents from the two classes, we performed the following cluster analysis procedure: all survey questions including ones about the lecturer, teaching assistant, portal and classroom were included; outliers were identified and removed (six respondents); a cluster analysis was performed allowing SPSS to choose the number of clusters. The averages of the course-related questions in the two clusters are reported in Table 2; the survey uses a seven point scale and high values correspond to answers such as 'very good' or 'very much'; standard

deviations are reported in parentheses. The significant difference between the clusters becomes clearer with medians rather than averages – for example, the median of the overall evaluation of the course is 4.0 in one cluster and 6.0 in the other. Verbal comments by students, which are part of the survey, include comments such as ‘the most relevant and interesting course in my MBA studies’, as well, as ‘too difficult, demands too much work’ and ‘too many subjects, not organized, superficial’.

Table 2. Student Evaluations, 2 General MBA Classes, Fall 2010/2011		
Number of students	100	
Number of respondents	54	
	Cluster 1	Cluster 2
Number of respondents in this cluster	20	28
Questionnaire items		
What is your overall evaluation of the course?	4.5 (1.0)	5.5 (1.2)
How much relevant knowledge did you gain from this course?	4.1 (1.1)	5.3 (1.3)
How much did the assignments contribute in achieving the course's goals?	4.0 (1.3)	5.1 (1.5)
How interesting was the course?	4.6 (1.2)	6.2 (1.0)

Table 3 presents the main results for two other classes we taught during the spring semester of 2011. Both classes are MBA students, one an executive MBA for lawyers majoring in finance, and the other general MBA with about half of the students with a BA degree in Media and Communication (the college has a large Media school).

Our reading of Table 3 is that the more experienced, somewhat older lawyers in the executive MBA class did not like the course and did not see the point of the projects. However, the younger media-oriented general MBA class liked the course and projects. Furthermore, comparing these results to the average evaluation in all the general MBA courses (5.1), it is interesting to note that the general MBA students found the course better than the average MBA course, which is uncommon for MIS or technology management courses.

Table 3. Student Evaluations, 2 MBA Classes, Spring 2010/2011		
	MBA for lawyers	General MBA
Number of students	27	50
Number of respondents	15	31
Questionnaire items		
What is your overall evaluation of the course?	4.2 (1.6)	5.1 (1.7)
How much relevant knowledge did you gain from this course?	4.3 (1.9)	5.1 (1.8)
How much did the assignments contribute in achieving the course's goals?	3.9 (1.6)	5.1 (1.8)
How interesting was the course?	4.1 (2.0)	5.6 (2.0)

Interviews

The quantitative results demonstrated two opposing views towards the course, therefore, the interviews were intended to further investigate the underlying reasons for these divergent opinions. This approach is compatible with mixed methods research design, which promotes the use of both quantitative and qualitative methods to complement each other. For example, broad-based survey results could be complemented with detailed views on the meaning of those results [Creswell 2003]. A convenience sample of four students from the Spring 2010/2011 cohort were selected and interviewed. The selection of the number of interviews in a qualitative study is not an exact science and is very much based on the context of the study and the research objectives [Baker and Edwards 2012]. The aim of these interviews was to follow up the issues raised by a larger, representative survey, hence a few “voices” from the student cohort was enough [Creswell 2003].

The students were selected on the basis of performance, one with a grade in the top 10% of the grade distribution (labelled as RL), two with grades in the median band of the grade distribution (labelled as TR and AM), and one student 10% below the median (NN). The resulting sample comprised one student from the Executive MBA Lawyer group and three from the General MBA group. The students were contacted by email one year after the course had been completed and asked to participate in a short interview (30 minutes). This one-year gap allowed for a wider, longer-term perspective of the course, that is, not reflecting on the results of the course but on the aftermath and providing some distance between the immediate consequences of the course and their feelings. The interviews themselves were conducted via Skype/telephone in English and recorded. The recordings were subsequently transcribed and analyzed with the help of QSR International's NVivo¹ qualitative analysis software. The interviewer was the only member of the co-authors who had not met or interacted with the students beforehand, therefore some degree of objectivism was established in the process. The fact that the interviewer spoke no Hebrew and conducted the interviews by referring to the lecturing staff in a formal way, also put some distance between the interviewer and interviewees.

The interview consisted of 6 semi-structured questions querying the students' level of engagement with the course and how the entrepreneurial flavour of the course, which was meant to mirror an entrepreneurial culture in Israel, affected that engagement. They were asked how motivated they were by the given task, i.e., that they should create a project as a means of being assessed in the course. Questions were raised about their imagination and creativity in developing new ideas for their projects, how persuasive they were in convincing others about the viability of their project, their judgement in validating the project and their feelings of ownership over the project. They were also asked whether the course worked, achieved its objectives or whether the student learned skills or concepts from the process.

¹ <http://www.qsrinternational.com/>

Thematic coding was done as part of the analysis of the transcribed interviews [Miles and Huberman 1994]. This is a qualitative data analytical method in which coding categories are selected, then segments of data (in this case, chunks of transcribed text) are associated with those coding categories. In our case, the coding categories were drawn from the SDT concepts explained in Section 2. The two authors coded the transcripts together and discussed the coding between themselves, agreeing upon common understandings of the coded segments. In reporting the results, the authors agreed upon a protocol as described here. Where the respondents perceived the SDT concepts negatively, they were coded as “lack of” the particular concept; for example, where the respondent did not perceive much autonomy over their conduct in the course, this was coded as “lack of autonomy”. The codes were subsequently grouped into five categories, Personality, Motivation, SDT Needs, Environment and Outcome. Table 4 and Chart 1 present the frequency of coding of the concepts in the transcripts of the four interviews. In later stages of analysis, coding categories are also related to each other and we report upon these relationships in the latter part of this section.

Table 4. Frequency of coding of SDT concepts in the 4 interviews

Categories	Concepts Coded	Student AM	Student NN	Student TR	Student RL
Personality					
	Autonomy orientation	-	-	7.8%	3.0%
	Controlled Orientation	-	1.4%	-	-
	Impersonal Orientation	23.5%	25.2%	-	-
Motivation					
	Intrinsic motivation	-	-	11.1%	5.9%
	Extrinsic motivation	-	7.3%	-	-
	Internalization	-	-	-	1.2%
SDT Needs					
	Autonomy	-	-	15.6%	5.8%
	Lack of autonomy	-	1.6%	-	-
	Competence	-	-	24.4%	14.2%
	Lack of competence	18.8%	10.2%	-	-
	Relatedness	7.5%	6.4%	22.2%	7.2%
	Lack of relatedness	10.9%	-	-	-
Environment					
	Autonomy support	-	6.4%	13.7%	19.0%
	Lack of autonomy support	29.0%	26.2%	-	-
Outcome					
	Performance	-	-	14.7%	6.7%
	Lack of performance	-	7.1%	-	-
	Surface Learning	5.2%	4.7%	-	-

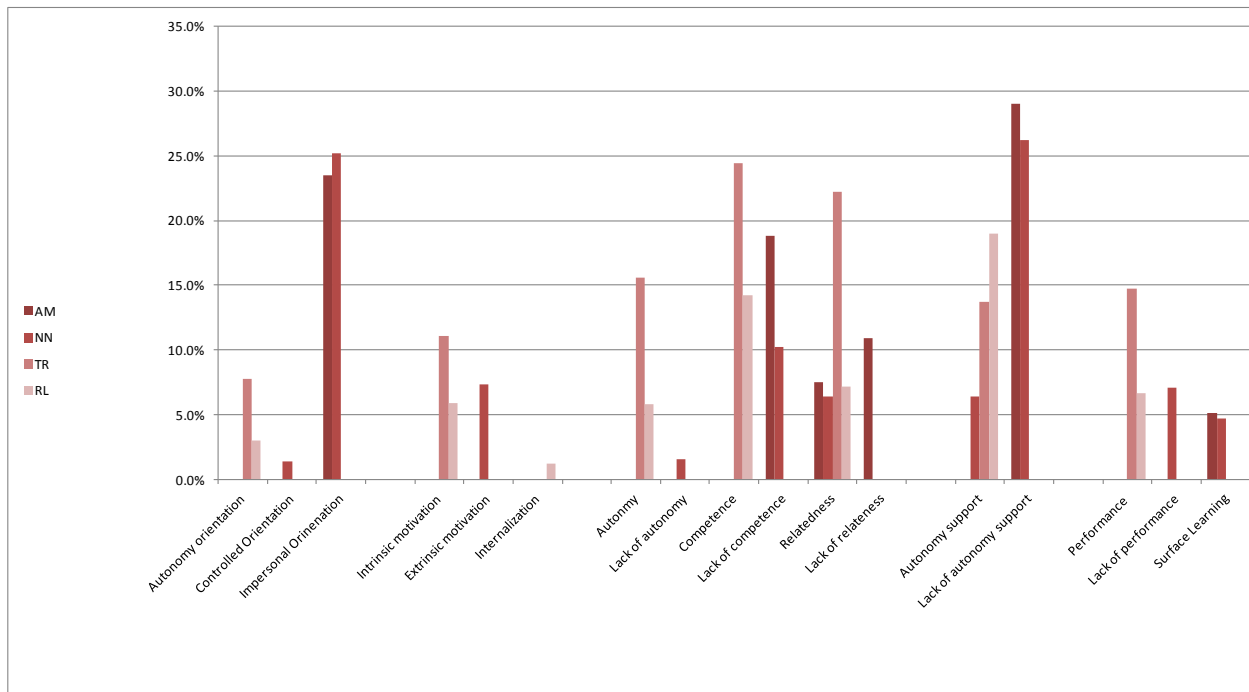


Chart 1. The frequency of coding of SDT concepts in the 4 interviews

Chart 2 includes an alternative representation of concepts that are expressed in a “negative” way by the respondents, i.e. concepts which represent the “lack of” dimension as described above. These concepts were assigned negative percentages, therefore the resulting chart illustrated that concept below the x-axis of the chart but within the category it was negating. For example, lack of autonomy was represented as a negative frequency in the chart under “autonomy” and becomes the “negative” dimension of that concept. Where the interviews seemed to support both the concept and its “negative” dimension, the two concepts were listed in the chart, one above the x-axis and one below with two different categorisations. This occurred in the case of “relatedness” and “autonomy support” where there were both “positive” and “negative” dimensions to the responses and therefore they were represented in the chart as “relatedness” and “autonomy support” above the x-axis and “relatedness (lack)” and “autonomy support (lack)” below. The resulting chart shows clearly that there was a split between the two pairs of interviewees, one positive about the five concepts being measured and one generally negative about the same

concepts.

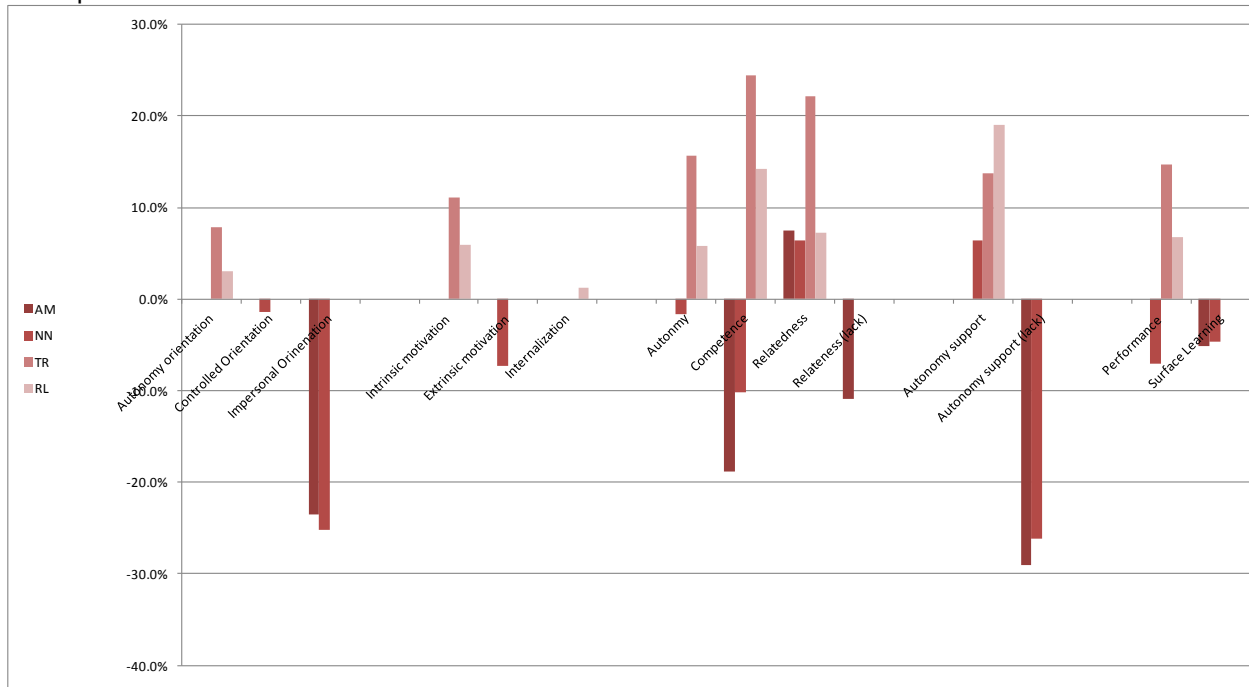


Chart 2. The frequency of coding of SDT concepts, with negative and positive aspects

The chart also demonstrates that interviewees who had strong perceptions of autonomy orientation (TR, RL), also showed strong inclinations towards intrinsic motivation, fulfilment of basic psychological needs according to SDT, autonomy-supporting environments and performance. Similarly, interviewees who indicated an impersonal orientation also showed strong inclinations towards extrinsic motivation, did not perceive fulfilment of their basic psychological needs, perceived lack of autonomy support in their environment and demonstrated lack of performance and surface learning. Below are the detailed descriptions of these relationships for each interview.

AM Interview

When interviewed AM expressed strong personal viewpoints that there was insufficient support provided by the course to enable the class to do well, demonstrating a lack of autonomy support. These viewpoints can be evidenced by quotes such as:

“The guideline was unnecessarily complicated ... I heard things more than once, I felt kind of bored, and I don’t really know how you can teach this kind of important stuff like being entrepreneurs. I think it’s not the kind of thing that you can lecture about.”

AM also spoke quite frequently about not having much influence over the outcomes of her studies and pointing out that the learning environment was more of a hindrance than a help to achieving the objectives of the course, for example the fact that students had no choice but to be made to work in groups which may or may not work in achieving the course outcomes. As a result AM was self-critical assuming a lack of success as compared to others in the course, thus demonstrating a lack of competence:

“For some people, building the website is an easy task and for others it’s quite complicated because the website most people did in class was the full website, they have a basic template, and you just need to put in all your visuals and you just put the text in too, so it doesn’t look like a really professional website, it’s quite simple and for a business, a real business, you need a real website, not something that has some funny ending like .weebly.com”

“There were kind of theoretical terms that [the lecturer] posed for the course sessions. It is... it comes back to your first questions where I told you that, either you have it or you don't have it, you can learn the terms, but if you [are not entrepreneurial] you can't take it one step ahead.”

AM also claimed lack of support from the lecturer in developing the project ideas so that it led to some feelings of lack of relatedness. At the same time, paradoxically, AM also felt relatedness to the entrepreneurs in Israeli society, the culture that this engendered and the role AM claimed to have played in participating in a protest against Israeli high cost of living, which the project attempted to deal with. The following quotes illustrate:

“And maybe [the lecturer] was kind of afraid ... to accept it because the technology part, in order to succeed in this, we said we might do it by scanning QRs and a year ago people didn't really know what was QR [Quick Response Code] ... One of the problems in the course that I have experienced, is that I have the sense that my idea is good and on the one side I wanted to share my idea with the class and tell it to [the lecturer] , but on the other side, if it is too good, I do not want someone else to come and take my idea, so this is kind of a complex situation”

The interviewee's overall perception of learning in the course was at a surface level and not much more. AM claimed that the content was something that was more related to common sense and not academic material that could be learnt in a course. At the same time, AM spoke about conceptual aspects as “unnecessarily complicated”. AM's focus was on learning how to be an “entrepreneur” but not recognizing that this was just a vehicle to study MIS concepts in a particular context. The aim of the course was therefore missed.

NN Interview

Similarly to AM, NN felt that there was not enough support in the learning environment in order to be more successful in the course, such as the group method of teaching.

“Not to impose the course theory on them because there were a lot of things that [the lecturer] taught, that would not, did not match our project and we had to impose the answers and obviously when it does not match, you are forcing it you know, you're just forcing it to something that is not natural for the answer to be, it's like if you keep trying to teach a ballerina how to dance jazz.”

Like AM, NN also felt that the environment was a hindrance rather than a help to achieving the course objectives, NN's views pertained to the wider environment as well, referring to the busy life that MBA students in particular had to juggle

“Most of us have families and regular jobs that we have to attend to and it is very difficult to find the time to get together. It was very complicated because tasks were interesting and we had to be very creative and to put some work into it and once you don't have the time to get together as 5 people, it's is un-motivating”

“As a student, I did not see that [developing a good project] as a possibility because there was so much pressure and you know, we just did not have much time to do that. But now especially when I am on ... leave I see that if you have a little time, you can do wonders, and [the lecturer] saw that and believed in that but I think he has to strengthen that ... student”

NN also experienced feelings of failure to achieve appropriate levels of competence in meeting the course objectives.

“The project we had to do was an online website on which you could do deliveries, you know if you have TV services come to your house or phone services, it was not successful because. They wouldn't want to work with us as a subcontractor, because then they would have to make their services more expensive

because they would have to pay us, so there were a lot of flaws in our plan, which we did not have the time or the energy to think through, that's why our grade was ... so-so"

Thus NN was mainly motivated by external factors (extrinsic motivation) to complete the course and as a result felt the group's performance was not that impressive.

"I don't know, we just did our best and the grades were according to that, they weren't so great. I think it was C or B- ... I don't think so, no, me for myself, I did not have the time or the energy to do that [project], but in general this is how I see my MBA studies, I did everything in the minimum just to get the grade"

Interestingly, NN complained about the group nature of the project but actually found this to be a positive influence, feeling a sense of relatedness to the other colleagues.

"We found good people that can help, except for one, ... but I think the interaction went very well especially if you have friends there. Every time there is one person that pushes harder than the others, it changes, you know, one week I push harder, the next week my friend pushes harder but I think all in all, we had a good interaction a lot of emailing, exchanging over the phone, or texts, it was very good"

Again, NN displayed surface learning recalling the course as a way to learn a lot about how to use the World Wide Web as a tool for creating interesting business ideas; NN had little or no recollection about the underlying MIS concepts that were supposed to be delivered as part of this course.

Additionally, NN also mentioned being "ashamed" at a personal level due to lack of achievement (in NN's opinion) in the course, citing the prevailing attitude in Israel towards MBA studies, as part-time studies, as a main impediment. In this way NN acknowledged a lack of autonomy in controlling the learning event.

TR Interview

Contrary to the interviewees above, TR had a strong perception of competence in the work for the course. TR stressed the importance and utility of the idea and the fact that it could be developed into something marketable.

"We come up with the idea that you can speak to your phone and it will translate it to SMS We called the idea, that venture STSMS - speech to SMS, and I think it was quite a brilliant idea but I don't know why I didn't have time to develop it but I think that...I believe that in the near future we will find some product like this in the market."

"I think everyone saw and understood the potential. Of course, we spoke about numbers and economic models for the venture, but I think in general the strongest thing was the notion that everybody thought about this, that they might use this idea or technology"

Along with feelings of competence was a strong sense of relatedness especially with respect to the group TR was working with, their acceptance of the idea and their willingness to work to develop that idea. There was also a sense of relatedness to the lecturer in that the idea was accepted and that the lecturer was supportive of it.

"Actually we considered a few ideas ... we spoke about the advantages and disadvantages and in the general items, I think the idea which I came up with was nice and good and we thought and we figured out that it can be developed because there was available technology and also [the lecturer] also put in his input and we discussed with him and after we considered all the items, we concluded this speech to SMS was a great idea"

There was also a sense of relatedness to the software industry or other technologists as a whole, as evidenced by this comment:

"I was discussing with a few friends of mine who were working in the Hi-Tech industry , it had good potential and [could be built] with relevant technologies that we don't have to develop, but only do a joint venture or buy the technology from the other side"

TR also showed inclinations towards satisfaction of autonomy needs since the project seemed to satisfy some personal objectives.

"I was very happy and it was very satisfying because to come up with an idea, with something that you think is needed in the market it is quite fulfilling, it was very nice and all the processes with [the lecturer] and with my fellows in the group, it was very nice"

TR expressed an experience in this course that was quite different to achievements in other degree courses, it was an experience in learning to think in different ways:

"I may have 2 degrees in Law, but I don't have a technological background; [the lecturer] also introduced us to technologies in the Web and everything that I was not aware of, so I think it was much more interesting and exciting and new for me ... you can say you learn how to think and to develop things 'out of the box', not in the traditional way"

TR also felt that the environment was broadly supportive of learning as compared for example with other courses:

"From my point of view, I think it is much more interesting to take part in a venture that you are part of it [rather than] analyzing or discussing a case study. We have another course which is called Strategy that we are doing, analyzing a lot of case studies, it's nice but I think it's more lively... fascinating to take part in the venture that you are a part of and you develop and analyze it. So I think the combination of the background, of the theoretical background and the practical experience was great and was very successful from my point of view"

Much of what TR expressed seemed to give credence to a sense of enjoying the course, of finding it "nice and refreshing", "fascinating" and "interesting and exciting". TR's comments also an inclination towards an autonomy orientation since TR spoke of an environment was supportive of the development of the project idea and that others were helpful towards this goal and provided useful developmental ideas.

RL Interview

The strongest impression reported by RL was one of autonomy support in that the project encouraged interaction and interest. The fact that the class was divided into groups, that students needed to use their imagination, that students were encouraged to defend their projects were all positively presented by RL.

"It was very easy, it was so much different than other projects I did in school, like just a paper you have to write, it's something that you have to really, like be interactive with, you have to really build something. I think it was very interactive. If you would ask me, I am on the last semester now so if you would ask me what are the one or two classes you remember that most, like in a positive way, like you were saying, I would say this class."

Also, RL reported that the group were able to demonstrate their competence in the task due to being able to accomplish activities and initiate ideas:

"What we did was we divided the work between us into different aspects. So, for example, the [one] who is working in financing, ... did the research part for the, [economic part], i.e., if this kind of business would be economical and, one person did the writing of the paragraphs, the thing we wanted to write, on the text ... and I did the design, so each person did something different, brought his..., what he knows best to do."

RL also reported that there was the possibility of building on this project to create a business:

"The fact that we did not do anything with it afterwards but at the same time we really wanted to 'yea, it's so good, we gonna make a lot of money', we believed in it"

There were also some sentiments regarding relatedness that RL expressed with regard to the interest the lecturer demonstrated, to the other members of the group as a whole and even towards famous entrepreneurs like Jeff Bezos (founder of Amazon.com):

"It was a group effort ... I think that everybody thought that they can really bring something from themselves into the project."

In terms of performance, RL seemed to grasp the main ideas of the course and not just the means by which the course was delivered, recollecting for example some of the underlying concepts such as competitive advantage and adding value through technology:

"Your idea you have to sell something using technology, using, in our case, the Internet, has to be [developed] in a way that, like I said before, it gives you the added value and not just 'oh, okay I can sell it in a store and also in the Internet'. No, it has to have this uniqueness, using the technology will have to bring the added value, and ... competitive advantage ...In a way this has to be our unique competitive advantage"

RL also displayed high levels of autonomy with motivational levels along the lines of intrinsic motivation, speaking, for example, quite a bit about enjoyment of the course:

"I was very excited with that project because it was something new, different from the other projects you get to do in school, so I was very excited and enthusiastic to do it and I put a lot of energy into it and I was very excited"

A few comments from RL suggest being able to identify with the project and relate the concepts to personal values:

"I know that in the end people really were proud of the project, really, they were proud of it and it was important you know, I think what I am trying to say is that they felt that they cared about it, really."

Relationship of concepts within interviews

In the case of AM, an impersonal orientation was linked to a feeling of lack of autonomy support from the learning environment, i.e. the way the course was structured. Accordingly, the basic psychological needs of competence and relatedness were not being met. This led to a lack of deep learning. AM did not appreciate or understand the conceptual frameworks that were part of the MIS underpinnings of the course and instead viewed them as unnecessary additions.

For NN, an impersonal orientation was also linked to a feeling of lack of autonomy support. Here, NN reflected on the lack of support in general for MBA students and not specifically in this particular course. The situation in which the students found themselves was thought to contribute to not being able to have much control over the outcomes of learning. NN also reported basic psychological needs not being met in terms of lack of autonomy and lack of competence, although relatedness was being met to some extent. This led to only satisfying the external requirements of the course, i.e. being extrinsically motivated and to a general lack of performance and deep learning.

TR showed some autonomy orientation and felt that the environment was supportive of autonomy and reported high levels of all basic psychological needs being met, especially competence and relatedness. TR also reported high levels of intrinsic motivation which led to a feeling of satisfaction with the relevant performance and learning.

RL, although not relating much information about personality orientation, did mention some aspects related to autonomy orientation. RL was more concerned with how the environment supported autonomy.

This also led to satisfaction of basic psychological needs, more in the vein of competence in comparison to relatedness and autonomy. RL was also able to report levels of intrinsic motivation and was the only one who related the course to deeper core values (internalization). RL was also satisfied with the relevant performance and saw the bigger picture of course much better than other interviewees.

Relationship across interviews

The findings strongly support the SDT theory as shown in the diagram below:

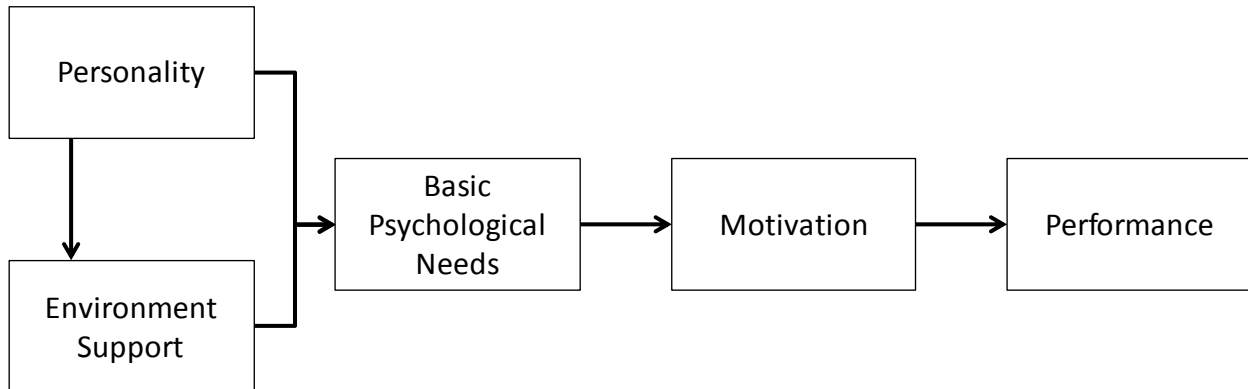


Chart 3. Relationships between the coded categories as represented in the interview analysis

One area which is surprising in the findings was to see three different levels of relatedness occurring in the sample. The three levels were: (1) relatedness to several wider groups outside of the academic environment, e.g. the Israeli hi-tech industry, well-known entrepreneurs like Amazon’s founder, or social movements; (2) relatedness to the instructor in this specific course; (3) relatedness to the members of the project teams, i.e. peers. This is surprising because (1) no other dimension of SDT appeared so consistently throughout the interviews, (2) no other dimension appeared at so many levels of abstraction and (3) we did not expect this dimension to occur in relation to groups outside of the teaching environment. The course found a way to meet at least one basic psychological need across all interviewees regardless of their performance. This result is discussed in more detail in the next section.

V. Discussion

This paper describes an entrepreneurial approach for teaching a Management Information Systems course. Using ideas from Self Determination Theory (SDT) [Deci and Ryan 2008; 2012], the course builds on the basic psychological needs for autonomy, competence and relatedness to create within students autonomous motivation and engagement. Student groups are required to initiate new electronic businesses, to build prototypes of their electronic web fronts and to describe business processes. In addition, several conceptual frameworks or information technology as related to markets and organisations are taught and the students are required to analyze their ventures with these concepts. Market aspects include strategic analysis, discussion of opportunities to influence transaction costs via technology and assessment of network externalities. Organisational aspects include description of the main business processes and description of decision making and data analytics.

We started teaching this course during 2009 and by the 2011 Spring Semester we have had five classes with more than two hundred students. The current paper uses feedback from the 2011 Spring cohort to analyze student engagement. We find two distinct clusters in this cohort: 52% of respondents think highly of the course, with median evaluation of 6 out of 7 points; about 37% of respondents are not enthusiastic with the course and their median evaluation is 4. We conducted interviews with four students and found out a similar split: “I think that everybody thought that they can really bring something from themselves into the project ... in the end, people really were proud of the project ... they felt that they cared about it, really” on one side, while another student felt *“There were kind of theoretical terms that [the lecturer]*

posed for the course sessions ... either you have it or you don't have it – you can learn the terms, but if you [are not entrepreneurial] you can't take it one step ahead."

The paper analyzes these results through SDT. We found that the structure of the course was able to engage some students in the learning process to the extent that they were excited and motivated. At the same time it also disincentivized and demotivated some students such that their performance was unsatisfactory to them and their learning incomplete. Thus the overall effect was not uniform. We interpret the positive effect to be related to autonomy support and positive feedback. As Deci and Ryan [2008 p. 418] state *"events such as positive feedback that lead to perceived competence by supporting the competence need, will enhance intrinsic motivation"*. In the same vein, we interpret the negative effect as being related to the informational aspect of negative feedback. Consider for example, Deci and Ryan's [2008 p. 418] assertion that *"if the competence information is sufficiently negative, indicating that people are too incompetent to attain desired outcomes, it could undermine both intrinsic and extrinsic motivation, leaving individuals amotivated"*, namely, negative feedback on the student's own choice is highly detrimental. Additionally, lack of engagement could have been related to an excess amount of tasks to be performed by the students because of the entrepreneurial nature of the project. Finally, these negative effects could possibly be related to the individual student's personality orientation and sense of agency [Niemiec and Ryan, 2009; Maclellan 2008]. The four interviewees were split into two groups, one of which expressed general satisfaction and support for their psychological needs while the other expressed lack of interest and motivation in the course. The interview analysis also revealed that the relationships between personality orientation, learning environment, basic psychological needs, motivation and outcomes are consistent with the theoretical perspective chosen for this study, SDT. The results matched well with the expected positions of the theory, namely that the two students who expressed autonomy orientation felt that their environment was supportive, that their psychological needs were being met and indicated high motivation [Ryan and Deci, 2000]. Students who expressed tendencies toward an impersonal or controlled orientation found the learning environment a hindrance, were not fulfilling their psychological needs and expressed low motivation towards the course. Although we believe the course provided the structure and support for autonomous student-centred learning, the personality orientations of the students, it appears, either enhanced or hindered their levels of motivation, and thus their performance. This emphasizes the need for agency on the part of the student, that is, the need for the student to assume some responsibility for their learning behaviour beyond what the environment may be able to provide [Schunk et al 2012]. As Pintrich [2004] states *"[it is] not just individuals' cultural, demographic, or personality characteristics that influence achievement and learning directly, nor just the contextual characteristics of the classroom environment that shape achievement, but the individuals' self-regulation of their cognition, motivation, and behaviour that mediate the relations between the person, context, and eventual achievement."*

The course also consistently seemed to appeal to the relatedness aspect of the three basic psychological needs, according to SDT, and to do so at the three levels identified in our findings. This can partly be explained by the group-work structure to which the students were expected to adhere. Group-work has been shown to be linked to student motivation especially where choice is exercised over group formation [Ciani et al., 2008]. Additionally, the instructor's role as mentor and facilitator would also have influenced an almost paternalistic sense of relatedness. This would explain at least 2 of the levels of relatedness found in the study, i.e., relatedness to peers and relatedness to the instructor. The other aspect of relatedness engendered by the course, even among students who failed to find autonomy support or to express feelings of competence, was a strong sense of belonging to groups external to the course, but somehow in the student's mind intrinsic to the course objectives. The sense of relatedness to the Israeli high-tech cluster and well-known e-business entrepreneurs could be explained by the entrepreneurial and e-business based orientation adopted for the course and the cultural associations that Israeli MBA students might make with such an orientation [Senor and Singer, 2009]. In fact, the need to be entrepreneurial or to be able to see oneself as an entrepreneur also seemed to factor highly into the other relatedness claim, that of belonging to a politically active group to which the entrepreneurial spirit could also be oriented. This aspect of the course appeared to engender strong emotions in the student cohort.

V. Conclusion

To conclude, we present in this section implications of the research for practice and limitations of the study.

As a guideline for policy in teaching MIS, we follow previous advice to experiment with new teaching methods in order to engage students [Austin et al. 2009; Aitken and Hatt 2012; Whelan and Firth 2012]. However, the SDT-based analysis shows that it would be advisable to provide students with a choice of traditional teaching methods (textbook and cases) and entrepreneurial or other practice-based methods. The courses should be described in detail in the programme prospectus emphasizing the tasks that students should do in completing the course. Alternative semesters for each stream would be a practical means of delivering these alternate streams without compromising resources. Students then select the stream that they wish to take. Thus teaching methods become self-selected [c.f. DeCosta 2011]. The four interviewees in this research would clearly have benefited from such self-selection based on the responses they have given: two would most likely have opted for the entrepreneurial approach and two would have opted for the traditional instruction-based approach, since the complexity of the course delivery to have been too challenging for them.

The study is limited in its generalizability to other countries and contexts since the course focused on imitating entrepreneurial ventures in the Israeli hi-tech cluster. There are, however, other countries and contexts where innovation may be encouraged by government interventions and an entrepreneurial culture may be continually discussed in the public domain. In such contexts, this entrepreneurial approach to teaching MIS may be successful. Our results are clearly limited by the fact that we analyzed the results of a limited sample of student cohorts within only one academic year. Therefore, our quantitative and qualitative data are limited to less than a hundred questionnaires and four interviews. Even with these limitations, the current analysis adequately demonstrates the opportunities and challenges in attempting a unique approach to MIS teaching.

We believe that this study has implications beyond the MIS course we describe and analyze. Information technology creates opportunities for new teaching methods [Kapp, 2012]. These include entrepreneurial projects, business game simulation, smart phone voting systems, debating and voting in social media, different variations on online and video-based courses. The analysis in this paper shows that these methods may create motivation and engagement with many students, but they may demotivate others, and our role as teachers is to align technologies with students' orientations and needs.

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