

Bachelor's thesis

Degree program in International Business

International Business Management

2013

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STUDENTS' ATTITUDES TOWARDS OPEN INNOVATION



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BACHELOR'S THESIS | ABSTRACT

TURKU UNIVERSITY OF APPLIED SCIENCES

Degree programme | International business

May 2013 | 58 pages

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In order to most efficiently utilize knowledge and technology, companies are increasingly developing open innovation models. Open innovation places emphasis on the inflow of external resources and outflow of idle assets. Human resources are considered to be a crucial element in the successful implementation of open innovation. Instead of emphasizing the internal elements of the work community and individual input and success, employees are encouraged to invest in collaboration and flexibility.

Due to the increasing development and implementation of open innovation strategies, this thesis sought out to study students' attitudes concerning open innovation. The research was built on describing the attitudes students have and determining where these attitudes stem from. Additionally, the thesis discusses the use of incentives to attract employees.

The empirical study was conducted in the form of an online questionnaire sent to international business students of Turku University of Applied Sciences. The responses indicated that many elements of open innovation were found to be positive. The main appealing elements were flexibility, cost reduction of R&D and the collaboration between different actors. Elements that were found disruptive were the lack of structure and the necessity of communication between companies.

The conclusions that were drawn based on the research were, that the subjects were influenced by still being amidst studies and though valued the idea of knowledge flow, felt uneasy with the communicational aspect. Additionally, it was concluded that developing an incremental system of enforcing flexibility may hinder the uncomfortable attitudes created by a lack of structure.

KEYWORDS:

Open innovation Attitudes R&D Not-sold-here Motivation Behavior Incentives Corporate culture

OPINNÄYTETYÖ | TIIVISTELMÄ

TURUN AMMATTIKORKEAKOULU

Koulutusohjelma | International business

Toukokuu 2013 | 58 sivua

Ohjaaja: Alberto Gonzalez

Minna Amelia Darwish-Hölttä

OPISKELIJOIDEN ASEENTEET KOSKIEN AVOINTA INNOVAATIOTA

Saadakseen mahdollisimman tehokkaasti hyödynnettyä tietoa ja teknologiaa, yritykset kehittävät enenevässä määrin avoimen innovaation malleja. Avoin innovaatio korostaa ulkoisten resurssien sisäänvirtausta ja turhien voimavarojen ulosvirtausta. Henkilöstöä pidetään keskeisenä tekijänä avoimen innovaation menestyksekkään toteutuksen kannalta. Sen sijaan, että korostetaan työympäristön sisäisiä tekijöitä ja yksilön panosta ja menestystä, työntekijät kannustetaan yhteistyöhön ja joustavuuteen.

Avoimen innovaation strategioiden kasvava kehitys ja toimeenpano oli taustalla siihen, että tässä opinnäytetyössä lähdettiin selvittämään millaisia asenteita opiskelijoilla on avointa innovaatiota kohtaan. Tutkimuksen tavoitteena oli kuvailla opiskelijoiden asenteet ja määrittellä mistä nämä asenteet juontuvat. Lisäksi, tämä opinnäytetyö pohtii kannustimien käyttöä työntekijöiden houkuttelemiseksi.

Empiirinen tutkimus tehtiin verkkokyselyn merkeissä, joka lähetettiin kansainvälisen liiketalouden opiskelijoille (Turun Ammattikorkeakoulussa). Vastaukset osoittivat, että positiivisia asenteita koskien avointa innovaatiota, oli moneen tekijään. Positiiviset asenteet koskivat joustavuutta, kustannusten alenemista tuotekehityksessä ja yhteistyötä eri toimijoiden välillä. Häiritseviä tekijöitä olivat rakenteen puute ja kommunikaation välttämättömyys yritysten välillä.

Tutkimuksen johtopäätökset on, että kohteiden olo vielä opiskelemissa vaikuttaa heidän asenteisiin ja vaikka tiedon virtausta arvostetaan, kommunikaatio tarve aiheuttaa rauhattomuutta. Lisäksi esitetään, että rakenteen puutteesta johtuvia epämiellyttäviä asenteita voidaan välttää lisäämällä vähitellen joustavia työtapoja.

ASIASANAT:

Avoin innovaatio Asenteet Tuotekehitys Not-sold-here Motivaatio Käyttäytyminen Palkkiot Yrityskulttuuri

ACKNOWLEDGEMENTS

I would like to thank my supervisor, Alberto Gonzalez, for all of the invaluable help and guidance he gave me during the process of writing this thesis.

This work would have been very difficult for me to produce without the motivation I got from my husband and son, every day.

Lastly I would like to acknowledge, that I could not have finished this thesis without my Äiti and Däddä. They have provided me with tremendous love and support, not just during this process,

Always.

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INTRODUCTION

The objective of this thesis

The way that work environments are organized has dramatically changed over the last couple of decades. Instead of the traditional style of keeping all information and resources far away from the competition, companies are increasingly selling idle resources and technologies and supplementing their own resources and knowledge with external know-how. Additionally, collaboration with other actors in the same sector in order to reap the most benefits has significantly increased. Since students are the future work force for many organizations utilizing open innovation, it is interesting to learn what their attitudes are towards this kind of style of working.

Companies are able to (amongst other benefits) increase customer value and use complementary technologies and services (Chesbrough et al. 2006, 205) but, does this kind of open innovation environment affect employee interest and commitment? In a way, instead of trying to influence employee drive by emphasizing the internal work community and solidarity, employees are encouraged to invest in flexibility and tolerance towards the external environment. It is useful to understand how these demands affect interest from an employee's perspective, in order to better enhance satisfaction and performance at the work place.

Attitudes are fascinating yet difficult study subjects. We cannot actually see attitudes (and some attitudes are formed in the subconscious mind), but we can try to observe them based on the behavior of individuals (Ajzen 2005, 15). Outsiders can observe possible likes or dislikes of others concerning several matters, including work and the work environment. These attitudes, which manifest themselves as behavior, may affect the work contribution an employee produces. Because attitudes are quite personal, and may be subconsciously produced, it is extremely difficult to measure the attitudes of people.

What motivates and interests employees and which factors enhance commitment have been studied to a vast extent. There are several different theories which try to explain the factors that drive the motivation of humans. Many different factors influence an employee's sense of motivation and interest; individualistic needs, perceptions of fairness and appreciation, the measuring of performance and receiving of rewards, how goals are set, and the specific basis for this thesis, the work environment (Kreitner and Kinicki 2010, 212). The work environment affects an employee in various ways. It is a physical environment in which to perform a job, but also the work environment is a way that an employee reflects on their self. The way that their work input is valued by their environment, molds employees self-worth. With the modern work place changing into a much more flexible and broader term, employees must change their expectations of the environment as well.

The starting point of this thesis was an interest towards the open innovation work environments of today, and the attitudes towards these environments. Additionally there was a want to know what might affect these attitudes and what incentives organizations could use to attract future employees.

As West et al. (see Chesbrough et al. 2006) touch upon these issues:

“Research is needed to establish how these new requirements affect the incentives and organization of R&D workers. If firms are to be agnostic about the sources and uses of innovation, how can this be reflected in their compensation, recognition, and other motivational techniques?”

It was decided to send out questionnaires to international business students of TUAS (Turku University of Applied Sciences). There was a specific interest in the opinions and attitudes of International Business students, because of the frequent occurrence of open innovation environments in international businesses. Getting a general grasp of the attitudes possessed by future employees, can

help managers and leaders develop open innovation environments to best enhance employee performance and attract the most qualified staff.

1.1 Research Questions

In the following, there will be a description of the research questions that were formulated and the objectives behind these questions.

1. What attitudes do students express towards open innovation environments?

→ Objective: To describe the attitudes and perceptions that students hold towards open innovation environments and try to determine where these attitudes stem from.

2. What are the components which have an effect on these attitudes?

→ Objective: To identify factors which influence attitudes and to try and determine whether some factors are more influential than others.

3. What kind of incentives could be used to increase motivation to work in an open innovation environment?

→ Objective: To establish what kind of incentives may attract employee candidates.

1.2 The structure of the thesis

This thesis starts with a review of the research done concerning the theoretical framework. It begins with a brief introduction to what open innovation is. Chapter three will open up components forming attitudes and continue with the description of attitudes relative to behavior and values. This will then be followed by a review of most commonly used methods to measure attitudes, after which

there is a depiction of the three most commonly discussed work attitudes. Chapter four goes into more detail on attitudes towards open innovation specifically. It will begin from a more general point of view concerning social attitudes, followed by attitudes held in the corporate culture, and finally reviewing attitudes of the individual working in an open innovation environment. The final chapters (six and seven) will introduce the methodology, the sample group for the research and the results based on the study. This will be followed by the references and appendices.

2 OPEN INNOVATION

Open innovation challenges the traditional vertically organized developing of ideas and products, and places an emphasis on the inflow and outflow of knowledge. It has been expressed that even the most advanced organizations should create a dialogue with external knowledge sources in order to capitalize on innovation. (Chesbrough et al. 2006, 1-3) Trott (2014, 248) concurs that open innovation builds strongly on the evaluation of external technology resources and benefiting from them.

As figure 2.1 presents, internal and external technologies support projects in open innovation. The point in time when external technology sources may be used, or internal technology sources transferred out, may vary from project to project. (Chesbrough et al. 2006, 2)

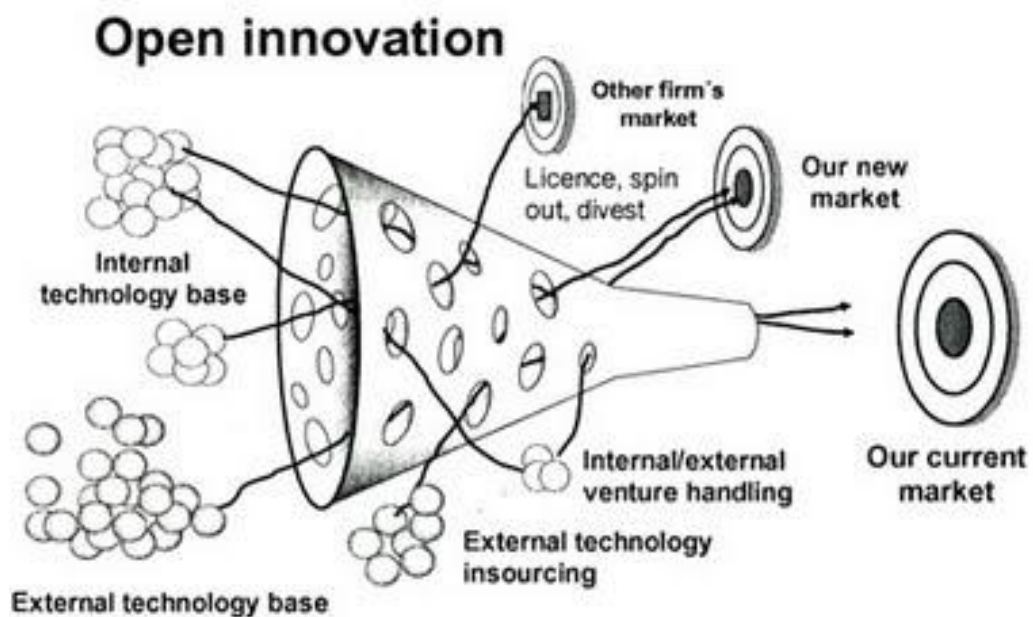


Figure 2.1. The open innovation process (Business Strategy Innovation 2009)

There are several reasons that have been presented to explain why open innovation has become such a popular phenomenon. Gassmann & Enkel (2004) see the main contributors to be that the innovation cycle is more rapid, industrial research has developed, and costs of development have increased. Additionally the need that organizations have to transfer internally idle technology to a company that may utilize it, has grown (Chesbrough 2004).

According to Chesbrough (2007) open business models increase value creation by utilizing external resources as well as internal ones. Every company has their own assets, and efficiency is promoted when open business models are used to capture external assets. Companies willing to participate in open business models can reap substantial benefits such as the saving of resources and time. (Chesbrough 2007, 68-69)

As a business process, innovation is still relatively new and developing and thus depends heavily on human resources (Hering & Phillips 2005). Lindegaard & Kawasaki (2010) present that people are the most important factor effecting the success of innovation. They add that capable people can turn weak ideas into working outcomes. This suggests that it is highly important for organizations to put effort into attracting and retaining the right personnel. Heikkilä (2010, 236) adds that innovation strategies must be made understandable and relatable to the human resources, in order to best harvest the possibilities innovation brings.

Korpelainen & Lampikoski (1997) suggest that in an effort to enhance innovation, it is necessary to shift attention and support from the individual member of the workforce towards cooperative efforts. This is supported by Birkinshaw et al. (2011) in describing sustainable innovation as being something that must be driven by interaction between individuals. Cooperation and team work is not however to be considered a requirement for innovation to work, rather a good way of organizing workers in order to further support self-reliance, creativity and communication (Lampikoski & Korpelainen 1997, 109).

A constantly touched upon challenge concerning the organization and management of open innovation is the very delicate balance between structured

support and creativity. Trott (2012, 85) illustrates that organizations must reduce costs that occur from wasteful and useless activities, yet also allow enough freedom and slack for innovation to thrive.

3 ATTITUDES

Humans have attitudes and thoughts regarding all important aspects of life, work included. Secord and Backman (1969, in Arnold 1991, 134) depict attitudes as feelings and thoughts which influence a person to act a certain way towards something or someone. Fritz (2008) goes on to add that attitudes mold the way we view the environment around us.

3.1 Components of attitude

There has been extensive research on how to define the components that make up an attitude. Social psychologists usually distinguish three components (see figure 4.1) influencing attitudes (William J. Mcquire 1999).

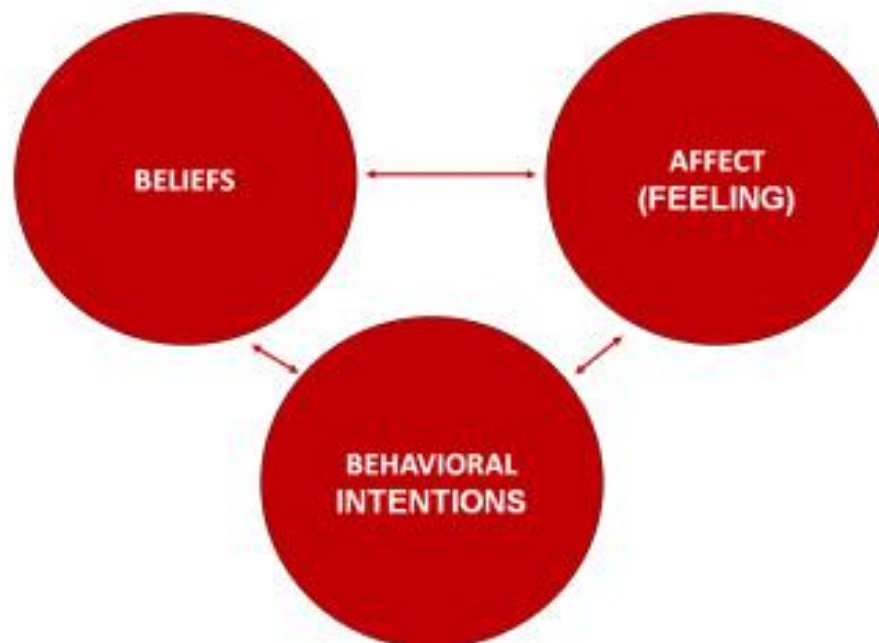


Figure 4.1 Components influencing attitudes (USC Marshall n.d.)

The affective component comprises of *feelings* that someone has towards something or someone. The beliefs (or cognitive component as it may be presented), represent what something *thinks* about matters. The behavioral component determines (based on feelings and thoughts) how someone intends to *act* in a certain situation. (Kreitner & Kinicki 2010, 161)

It is common that the previously mentioned components might be difficult to notice. According to Wittenbrink and Schwarz (2007) people may have difficulty recognizing where attitudes stem from. These so-called implicit factors of attitudes can be caused by bias feeling and differences in contexts. This is an issue which makes it difficult to reliably understand the issues which affect attitudes.

3.2 Attitudes and behavior

As presented earlier, attitudes are linked to how people behave. Ajzen's (1991) Theory of Planned Behavior goes further in connecting attitudes to behavior by indicating intentions as an influencing factor as well. Ajzen's model states that attitudes, interacting with subjective norms (created by social pressure) and perceived behavioral control (the perceived ease or unease of the behavior) all contribute to ones intentions. The intention expresses the readiness to finally execute the behavior.

Figure 4.2 depicting attitudes, norms and control in relation to intentions and behavior:

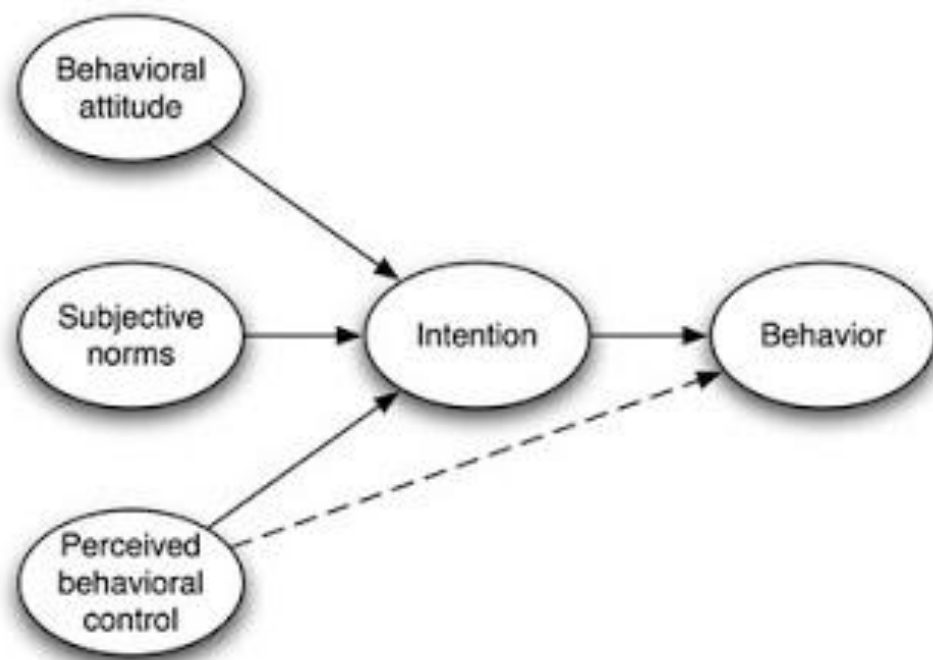


Figure 4.2 Ajzen's Theory of Planned Behavior (The Public Health Models 2011)

Glasman & Albarracín (2006) add that attitudes must be stable in the long-term in order for them to influence behavior.

Attitudes and behavior do not always align. This kind of inconsistency can create a feeling of discomfort in a person's mind called cognitive dissonance (Festinger 1957). Festinger goes on to present that individuals will try to reduce this feeling of discomfort by changing attitudes, minimizing the importance of these inconsistencies or finding factors to outweigh the contradicting ones.

Stone and Cooper (2000) suggest that the process of dissonance occurs when a person realizes that standards they have set for themselves are not met regarding the behavior they are performing.

One can imagine that these kinds' inconsistencies regarding attitudes and behavior are common amongst the workforce. Working individuals cannot decide every behavior they must perform based on their own attitudes.

3.3 Attitudes and values

The values we have, direct how we live our lives as well as influence our perceptions. Values are not necessarily of the same worth nor are they always consciously constructed (Naagarazan 2006, 3). Scientists have traditionally spoken of personal and cultural values.

Personal values have an impact on the attitudes we form and therefor, in the end affect our behavior. It has been suggested that people who let their values guide their actions, reach their goals more readily (Gardner et al. 2007, 103). This suggests that having a true understanding of what inner values you possess, may steer your actions in the most efficient direction.

Every culture has a set of values that it instills in its members. Some cultural values are very universal and may be shared by most countries. But some are more unique and form a cultures so-called value system. (Solomon et al. 2010, 198)

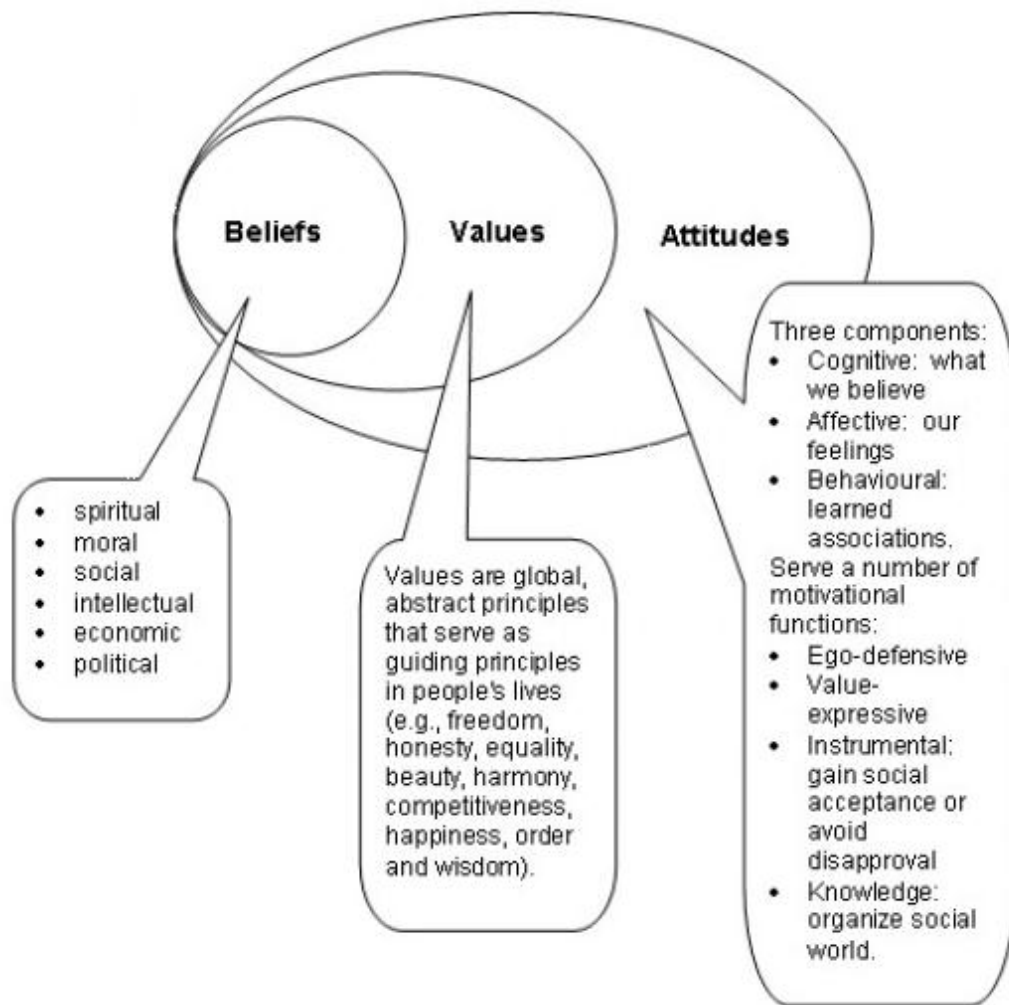


Figure 4.3 The construction of beliefs, values and attitudes (HubPages 2010)

One can observe from the figure 4.3 how our beliefs effect our values and attitudes, and values effect attitudes. When comparing values and attitudes, one may notice that values are even more difficult to express. Then again, attitudes and the behavior they promote may reveal underlying values.

3.4 Measuring attitudes

Attitudes can be examined focusing on either implicit (indirect) or explicit (direct) measures. The implicit attitudes are not visible and are difficult to determine whereas the explicit ones are more readily uncovered. Explicit measures in-

volve a subject answering a questionnaire in a self-report manner. The implicit measuring happens when a subject is asked to perform a task, and attitude is evaluated based on the performance. (Payne et al. 2008)

3.4.1 Explicit measuring

The purpose of using questionnaires with explicit measuring is to find out a subject attitudes accurately (McLeod 2009). The challenge of these measures and scales is something called *social desirability effect* (Arnold et al. 1991, 136). This effect means that subjects might not be willing to divulge their true opinions. In the follow is a presentation of three (3) scales using explicit measuring.

A Likert scale is used to process general feelings about subject matter (Jamieson 2004). The scale was developed (Likert 1932) to find out participants agreement or preference towards a matter.

Figure 4.4 shows the different options in a Likert scale.



Figure 4.4. Sample scale of a Likert scale (SurveyGizmo n.d.)

The Thurstone scaling was developed and presented by Louis Thurstone (1929). The method uses statements of an object, ranging from negative to positive (neutral included) to clarify a participants agreement with those state-

ments. Based on the answers, an evaluation of the respondent's attitudes is made. (Oxford Reference 2013)

Below is an example of a Thurstone Scale:

1. Achieving success is the only way for my child to repay my efforts as a parent.
Agree _____ Disagree _____
2. Going to a good college and getting a good job are important but not essential to my child's happiness.
Agree _____ Disagree _____
3. Happiness is more likely if a person has attained his/her educational & material goals.
Agree _____ Disagree _____
4. The customarily valued trappings of success are not a hindrance to true happiness.
Agree _____ Disagree _____

Figure 4.5. A Thurstone scale example (Research Design 1999)

The semantic differential method was introduced by Osgood et al. (1967). The evaluation of attitudes was not a top priority of this method, but it has recently been adopted for the assessment of attitudes. The function of the method is that it presents polar opposite adjectives with a point rating scale (5-7) between them. The subject is then presented with something which to evaluate on the scale. (Osgood & Zella n.d.)

An example of The Semantic Differential Scale is presented in figure 4.6:

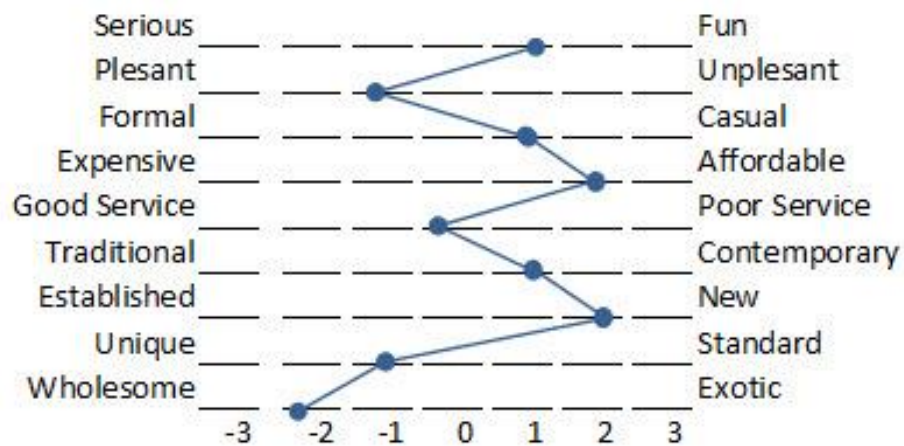


Figure 4.6. A Semantic Differential Scale (Web Surveys 2011)

As seen in figure 4.6, the Semantic Differential scale makes it possible to calculate a mean (or median) of the overall opinion or attitude held by the subject. It can be positive, negative or neutral.

3.4.2 Implicit measuring

To avoid a subject intentionally giving a dishonest answer (social desirability effect), techniques requiring a subject to project true attitudes indirectly may be used in the questions. An unclear stimulus is presented to the subject after which the subject is asked to interpret this stimulus. The implicit methods have been under scrutiny because of their lack of objectivity, as well the fact they do not clearly state to the subject what is being studied. (McLeod 2009) In the following is a brief description of two (2) commonly used implicit measuring scales.

The Rorschach Inkblot test is one of the most commonly used psychological test methods. The subjects are presented with inkblots and based on what they see, evaluations are made about their attitudes, beliefs and thought processes. (Strack 2006, 473)

Figure 4.7 presents one of Rorschach's inkblots:



Figure 4.7. Rorschach inkblot (BBC 2012)

The test has been criticized for numerous reasons (BBC 2012);

1. Objectivity problems: A psychologist will most certainly project their own values when evaluating results.
2. Validity issues: The test was originally created to study schizophrenia, not the personality of subjects.
3. Reliability: Two testers may conclude two different sets of thoughts concerning the same person. This is because of the lack of formal structure in the evaluation.

Thematic Apperception Test (TAT) entails showing the subject four to six different provocative and ambiguous pictures, based on which they must answer the following four questions:

1. What is happening?
2. What has led up to this situation?
3. What is being thought?
4. What will happen?

By answering these questions, the subjects will theoretically project their own opinions and attitudes in the process. (Solomon 2010, 185)

In the purpose of studying attitudes, this seems to be the most unreliable since it is very difficult the examine consistency.

Below is an example of a picture used in the Thematic Apperception Test:



Figure 4.8. A Thematic Apperception Test image (Thematic Apperception Test Images 2011)

When attempting to describe attitudes of a larger group (for example students), it is most reliable and consistent to use explicit measures.

3.5 Do attitudes predict behavior?

The relations between attitudes and behavior may be strong or weak, based on the attitude, the behavior, the person and the situation. This relation determines how likely it is that an attitude predicts behavior. (Fazio & Roskos-Ewoldsen 2004.)

Regardless, it has been presented that attitudes effect behavior relatively loosely. Reasons for this may be:

- Social pressures (such as laws) may force a person to act against their own attitudes
- Limitations of a person's abilities to behave a certain way
- It has been indicated that further studies should be made in order to truly understand the correlation between attitudes and behavior
- Behavior has been studied short-term, instead of taking a more reliable long-term approach

(Arnold et al. 1991, 142)

Martin Fishbein (1975) created the *theory of reasoned action* (see Solomon 2010, 289) which goes on to support these assessments on how attitudes effect relevant behavior. The theory differentiates intentions and behavior. This is due to the fact that many things can alter possibilities to express a behavior, despite it being an intention. Other people may also influence our behavior. The opinions of others may be held in such high regard that it alters our behavior dramatically. (Solomon 2010, 291)

It is difficult to evaluate how people may act, based on their attitudes or beliefs.

3.6 Work and organizational attitudes

This portion will separate three (3) key work attitudes; (i) organizational commitment, (ii) job involvement and (iii) job satisfaction. It is beneficial for manag-

ers and employees alike to understand these work attitudes, as they play a big role in the work environment.

The lines between formal (like those formed by an organization) and informal (for example friends) groups have blurred, and this has resulted in the rise of challenging issues concerning group dynamics (Kreitner & Kinicki 2010, 275-277). The people currently entering the workforce feel more at ease with ambiguous boundaries, but for work environments like these to work, it requires the revolution of work methods and managing.

3.6.1 Organizational commitment

The attitude of organizational commitment effects commitment and identification an employee feels. By identifying with a work community, an employee feels a connection and a similarity of goals. The stronger the commitment, the harder the employee will strive to work in order to achieve organizational goals. (Kreitner & Kinicki 2010, 166.)

One of the most commonly used models in this area of discussion is *the model of organizational commitment* (Meyer & Allen 2007). The model is based on three components which effect commitment. These related components are influenced by a variety of different issues.

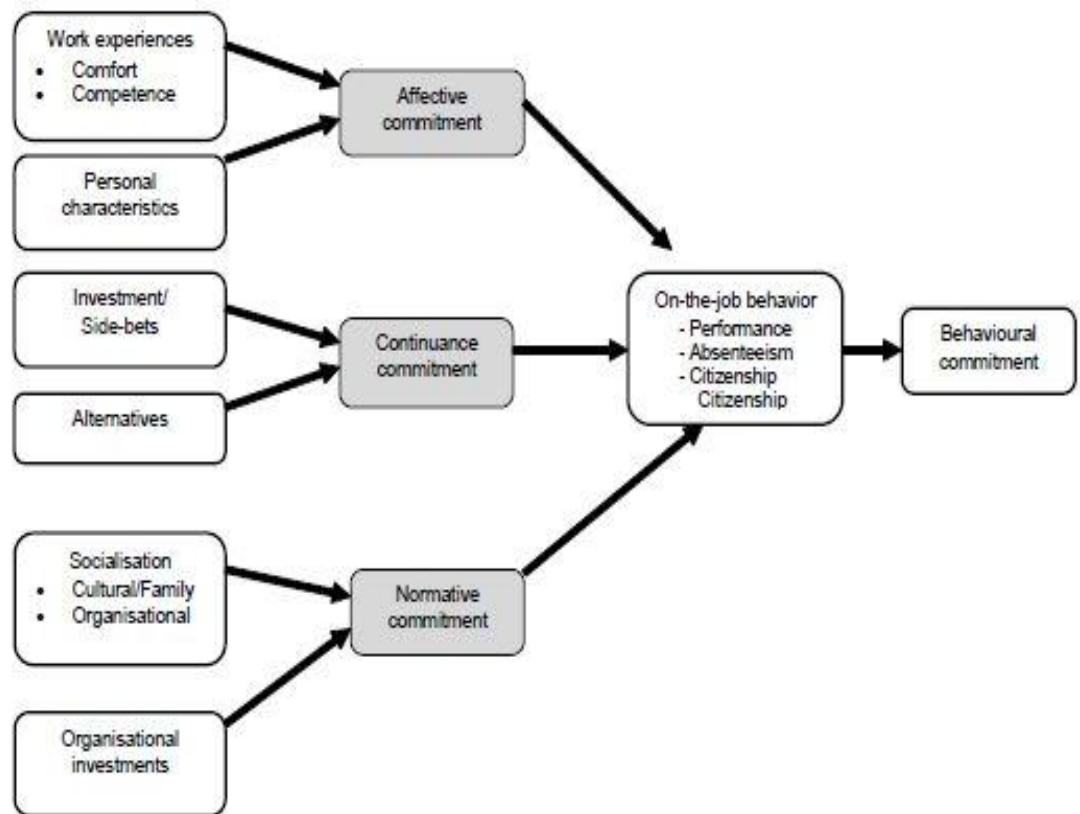


Figure 4.9 The organizational commitment model (Sajhrm 2010)

The three components depict the different perspectives from which an individual's commitment can be examined. They are

- Affective: includes a person's individual characteristics, experience and values
- Normative: includes socialization and psychological contract
- Continuance: includes lack of alternatives and investments

All of these matters influence an employee's work behavior and consequently commitment to an organization. (Jaros 2007)

This model is similar to the models discussed earlier. It generalizes and has a narrow outcome in describing the subject. Based on the issues effecting its components, it seems the model is mainly interested in the intentions of an employee to stay in an organization.

3.6.2 Job involvement

Job involvement is similar to organizational commitment, and in many respects there are aspects that overlap both attitudes.

The difference is that this perspective also takes into account the aspects surrounding doing the actual job. It considers how preoccupied an employee is with their job, how engaged or distracted they are and how concerned they are with matters surrounding their work (Chughtai 2008).

It has been suggested that the higher the job involvement, the more effort put in. Brown & Leigh (1996) have hypothesized a model which suggests that the greater the job involvement, the higher the effort (time and energy) exerted.

3.6.3 Job satisfaction

Job satisfaction is the attitude concerning, how content an individual is with their job. Visser & Coetzee (2005) assess the effects of the two different forms of job satisfaction; cognitive and affective. Affective job satisfaction is the feelings an individual has about their job in a general sense, whereas the cognitive focuses on satisfaction of separate areas of the job. Visser & Coetzee prove in their studies that different consistencies of affective or cognitive job satisfaction effect job performance. This suggests that there is a direct correlation between job satisfaction and performance.

Kreitner and Kinicki (1997, 2010) review the five (5) predominant models of job satisfaction:

1. Need fulfillment: job satisfaction is derived from how well an employee can fulfill their needs
2. Discrepancies: the satisfaction is influenced by whether expectations of an employee are met

3. Value attainment: satisfaction is gained when an employee may fulfill their work values
4. Equity: how fairly an employee perceives they are treated at work influences their satisfaction
5. Genetic components: an employee's genetic factors effect satisfaction, as well as personal traits

Fulfillment seems to be a crucial aspect effecting job satisfaction. Many arguments (if not all) presented above influence us in our job satisfaction at some point of our careers.

4 ATTITUDES CONCERNING OPEN INNOVATION

Open innovation has become increasingly popular amongst organizations. For this reason many studies have been conducted to understand the attitudes of employees towards this method of knowledge and technology transfer.

It is necessary to distinguish between attitudes of employees in a company and the general public. Additionally, companies founded based on open innovation strategies and companies shifting their more traditional closed innovation methods to open innovation, can have different insights regarding open innovation.

4.1 Social attitudes towards innovation in Europe

How a new product or service succeeds depends on how readily consumers are willing to adapt and diffuse the technology. The extent to which consumers are willing to receive innovations has a direct correlation with demand for innovations. (European Commission 2012)

A study conducted about innovation drivers and barriers, made for European Commission by Unu-Merit (2012), describes four main factors which influence the attitude of consumers towards innovation:

4.1.1 Social environment:

Friends, relatives and other inspirational individuals influence what a person perceives to be subjective norms. These norms guide how a consumer forms their attitudes and behavior, also regarding new technologies. Image also plays a significant role in that, adopting certain innovations can be a reflection on personal status.

4.1.2 Personal innovativeness

The element of high personal innovativeness requires willingness to take risks and to try new technologies.

4.1.3 Demographics

The group usually calling out for products developed on innovation are (usually) young men with high-level education (The Innobarometer 2005).

4.1.4 Cultural environment

The cultural element can enhance innovative behavior through support and reward. It has been assessed that Hofstede's cultural dimension can predict to some extent how different countries may embrace innovation (European Commission 2012).

The cultural dimensions of Hofstede are:

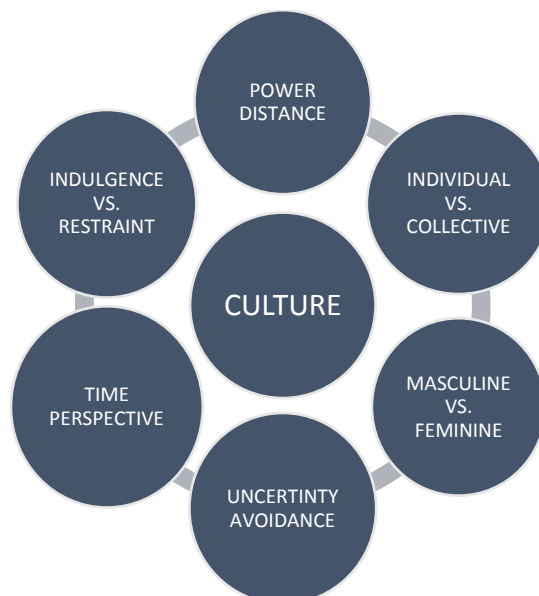


Figure 5.1. Hofstede's Cultural Dimensions (The Hofstede Center n.d.)

The power distance dimension measures how much hierarchy and inequality a culture will tolerate. Cultures with high power distance, that is strong hierarchical formation (for example in the work place), will not be as active in the production of innovation as a culture with low power distance. This is because innovation requires a certain amount of horizontal execution in order to thrive. (European Commission 2012)

The individualistic vs. collectivistic dimension measures how a society values group action and loyalty versus a more individualistic approach. It has been suggested that individualistic cultures are more open to innovation because a new product may be a means to distinguish oneself from others (European Commission 2012).

The masculine vs. feminine dimension measures prevailing characteristics of a culture. It portrays the values and different roles between the different genders. Masculine being more assertive and feminine more nurturing. Masculine high cultures are more likely to seek out and purchase innovative products, as they may be viewed as status enhancing (European Commission 2012).

The uncertainty avoidance dimension measures how much a culture can stand uncertainty, for example new and unexpected situations. It is suggested that low uncertainty avoidance cultures are more open to new products such as those utilizing innovation. In contrast high uncertainty avoidance cultures seem to steer away from new things as they pose risks (European Commission 2012).

The last two dimensions were not included in the study (European Commission 2012).

4.2 Corporate culture

The expectations directed at the present workforce have developed largely. An organization and the workforce it employs is expected to be fast, efficient and flexible (Kreitner & Kinicki 2010, 17). High education and internationality are also increasingly required traits of employees in Finland (Tulevaisuus 2030). It is not only the expectations towards employees that have changed, the employees also demand more from their employer and work environment. The younger workforce puts more emphasis on jobs being enjoyable and supporting their personal life (Tuppurainen 2009, 22).

Lichtenthaler et al. (2011) present that the implementation of open innovation strategies may be hindered by negative corporate culture attitudes towards the matter. Golightly et al. (2012) concur that the culture and attitudes an organization holds has a huge impact in the success of open innovation strategies, adding that particularly old traditional companies seem to encounter more of these challenges. A common reason for the negative attitudes and reactions is, that a company may have to completely change its long established habits and strategies in order to implement open innovation (Mortara et al. 2009).

Mortara et al. (2009) suggest that it is difficult, if not impossible, to change the deepest levels of a corporate culture. But an effort can be made in shifting attitudes present in the more shallow levels.

4.2.1 Not-invented-here syndrome

A main influencer of the negative attitude held by a corporate culture towards open innovation is the not-invented-here syndrome. This syndrome describes a social culture making an effort to avoid the use of external resources and over-protecting internal assets (Wikipedia 2013). A similar disposition being the not-soled-here syndrome of similar characteristics. These kinds of attitudes are problematic because they can hinder communication and delay the making of decisions (Trott 2012, 94). Lindegaard (2013) mentions that people may feel

threatened by open innovation and act protective over their own innovations. Mortara et al. (2009) suggest that leaders can reduce negative attitudes by demonstrating the potential found in external resources and involving employees in the decision-making process. Heikkilä & Heikkilä (2000, 31) suggest that a way to involve people in the decision making is to open a dialogue between employees and commit people to common goals.

4.2.2 From R&D to C&D

Huston & Sakkab (2006) present how shifting a company's research strategies from R&D models to a C&D model, a connect and develop model, requires increasing the corporate culture's proudly-found-elsewhere attitudes. The problem with the C&D model is, that it may create mixed feelings and attitudes amongst the resident R&D experts. As O'Connor (2006) observes, the tasks of the R&D department can in some cases appear to be more of the assembling nature, rather than actual developing of technologies. This kind of role ambiguity and shift away from traditionally recognized tasks, may create a negative and uncertain atmosphere. It is necessary to bear in mind, that when the R&D structure is modified towards a more innovation-friendly format, it must be consistently kept on that chosen path. Trott (2012, 95) illustrates that continuity is an important attribute of R&D and that without continuous efforts to sustain a chosen research structure, creativity might diminish.

4.3 The attitudes of the individual concerning open innovation

Lee and Wong (2006) suggest that there are two main contributors to an individual's performance in innovational tasks; the attitudes held by the individual and the organization's reward system. They go on to propose, that individuals with positive attitudes towards elements of innovation, will more likely succeed in innovational endeavors. Heikkilä (2010, 41) stresses the need for a creative

outlook in individuals working amongst innovation, yet warns of the conflicts creativity may bring about. He adds that overtly creative individuals may have the habit of questioning established habits in an organization and this may cause friction.

4.3.1 Rewarding to boost innovation

The issues of intellectual property rights, control and incentives highly influence the attitudes individuals hold towards open innovation. Properly compensating individuals for their efforts provides enough incentive to overcome some attitudinal barriers but not all. Scientific freedom and furthering the possibility of publishing are also considered valuable incentives to improve attitudes concerning open innovation. (West & Gallagher, see Chesbrough et al. 2006, 86-87)

4.3.2 Uncertainty might hinder creativity

Due to the new and complex dynamic of open innovation, structural elements are not as defined as in more traditional business models. Communicational problems, language barriers and a lack of decision-making metrics can hinder the proper function of an individual in an innovation team (Wilson 2010). Unease in performing work tasks create negatives attitudes and increases lack of motivation.

4.4 Motivation influencing attitudes

Arnold et al. (1991, 171) define motivation as the direction a person steers their actions, and consequently how much effort and time they are willing to spend on performing these actions. Solomon et al. (2010, 179) specify that behind motivation are motives which are goal-oriented and vary in strength. Mitchell (1982) proposes that motivation is not as simple as just a particular behavior, it

is more the internal and external powers which affect the behavior. Statt (1990) concurs by expressing that motivation is a process, in which drive and needs result in behavior to satisfy those needs. Motivation may be influenced by the environment in which a person acts, or it may be driven by a person's internal elements such as needs and satisfaction (Kreitner & Kinicki 2010, 212).

4.5 Motivation concerning open innovation

West & Gallagher (2006) present how remembering motivation and incentives in open innovation is crucial. They divide incentives for participating in innovation into two categories; 1. Innovations benefit the innovator and others, without providing the innovator with loss. 2. Innovators also benefit from sharing their innovations with competitors if it broadens the market. (Chesbrough et al. 2006, 86-88.)

Motivations may be divided into intrinsic and extrinsic. Financial gains and the possibility to acquire experience are common extrinsic motivations, whereas the intrinsic are formed from more abstract elements like identity or challenge. (Boudreau & Lakhani 2011)

It has been noted that motivating individuals to produce innovations is very similar to motivating outside corporate partners to participate in the outflow/inflow behavior. Motivation is often promoted using financial returns, but since intellectual property is usually concerned, upholding motivation may not be that straightforward. (West et al., See Chesbrough 2006, 288-289.) Birkinshaw et al. (2011) argue that social rewards are more useful in the promotion of creativity because innovation generates intrinsic benefits. They continue to add that offering extrinsic rewards may actually hinder an individual's motivation, as it may be seen as an attempt to manipulate the mind.

5 METHODOLOGY

5.1 Research methods

Methods in research may be divided into two categories; qualitative and quantitative. Both methods produce different kind of data regarding orientation, approach and perspective. (Ghauri & Grønhaug 2010, 105)

The qualitative analysis method focuses on the more ambiguous data, such as data collected through open questions. This kind of data is non-numeric and is very difficult to analyze in a standardized way. It is also unavoidable that the researcher will influence the data by interpretations and perspectives they hold. (Saunders et al. 2007, 482-484)

Quantitative data is numeric and relies on analyzing statistical relations and comparisons. It is common that before quantitative data is analyzed, it gives away very little information regarding the subject matter. (Saunders et al. 2007, 414-415)

This thesis uses both quantitative and qualitative data in order to achieve objectives of:

- Describing students' attitudes regarding open innovation
- Finding out which factors influence these attitudes
- Presenting what kind of measures can be taken to attract employee candidates

The thesis starts by reviewing qualitative data, in the form of a theoretical framework. Additionally, a survey was conducted to collect quantitative data to help support research and analyzing.

5.2 Research strategy

Formulating a clear research strategy is very useful when conducting research. The mission of the strategy is to help reach objectives and answer the research questions. (Saunders et al. 2007, 141)

The strategy chosen for this thesis, was to conduct a survey. This was decided, because it was the most logical way to review attitudes and ideas students have concerning open innovation. The objective was to collect quantitative data and use the theoretical framework to help interpret it.

The survey was conducted in the form of a questionnaire (see appendix). Questionnaires help to explain the variability and therefore are commonly used to inquire attitudes and opinions (Saunders et al. 2007, 362). The survey tool used was the web based Survey Monkey.

5.2.1 Sample group

For practical matters, in order to try to understand students' attitudes concerning open innovation, it was decided to focus on international business student of Turku University of Applied Sciences (TUAS). The number of responders' ended up being 32 students. This was a relatively positive amount, considering that summer break had started at the time of inquiry.

5.3 Data collection

The qualitative data, for the theoretical framework, was collected using various sources. The books reviewed for the background information were from several different libraries and the online library of TUAS, Nelli Portal. Additionally, articles and reviews were collected from numerous sources including; Google Scholar, The Harvard Business Review, Wikipedia and DuckDuckGo.

The link to the survey was sent to all international business students of TUAS. Additionally the link was presented in Facebook, through different forums set up for IB students.

5.4 Credibility of the research findings

The issue of credibility should always be considered when conducting research. As Saunders et al. (2009, 156) present, planning and performing research properly can reduce the possibility of false information, but you can never be certain that interpretation is done correctly.

From the participant's angle, threats to reliability may occur two different ways. Participant error takes place based on that studies done at different times may yield different answers. Participant bias may occur when subjects are concerned about how their answers may be interpreted. (Saunders et al. 2009, 156) The prospect of participant error or bias is quite unlikely in this study, due to the fact that instead of answering questions about their current work, students answered questions about a new method of business. Observer error and observer bias, meaning that researchers conduct and interpret differently (Saunders et al 2009, 157), is a relevant concern when analyzing the reliability of this study. The highly structured questionnaire was made in an effort to diminish this concern.

The sample group size was small, but considering the population, it was adequate. A population is the whole group from which the sample is taken (Saunders et al. 2009, 212). The population for this research was the international business students of Turku University of Applied Sciences. It would have been useful to broaden the research sample to international business students in other schools as well.

6 RESEARCH ANALYSIS

In the following is an overview of the answers collected through the survey. Each question is followed by a brief analysis. A more thorough chapter containing results will follow later.

6.1 Demographics of respondents

1. Please indicate your gender:

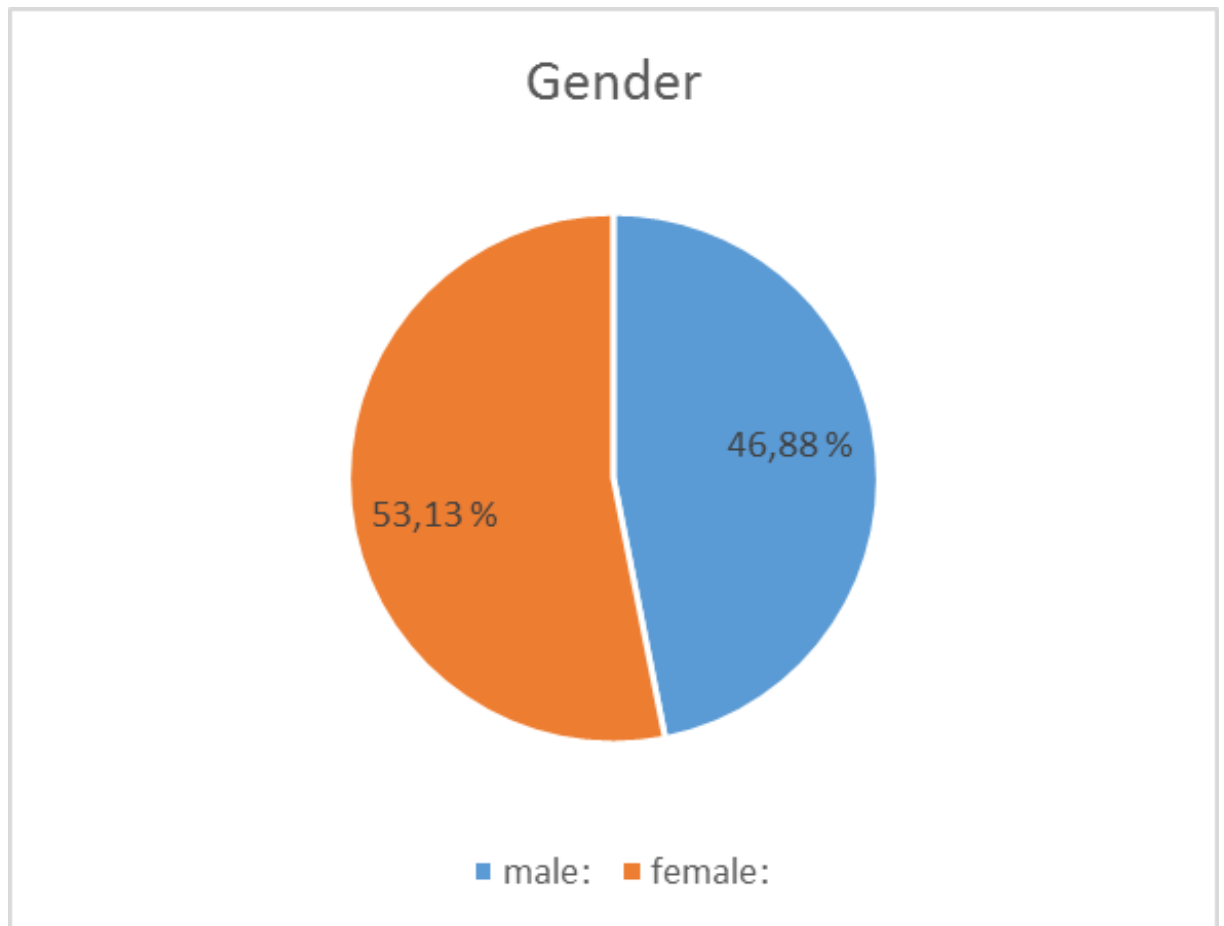


Figure 6.1. Gender of respondents

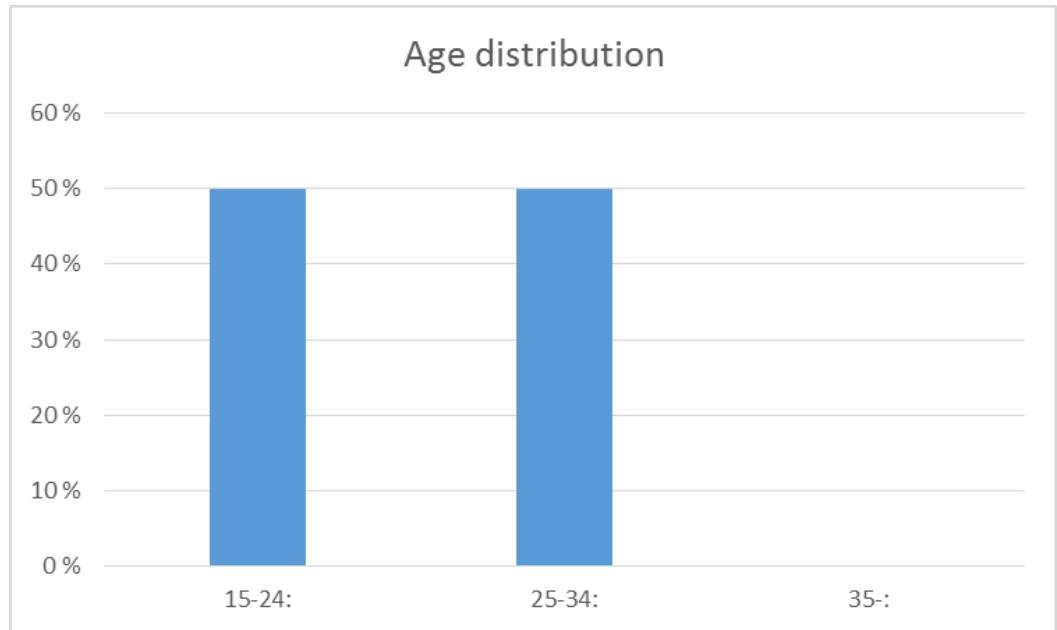
2. Please indicate your age:

Figure 6.2. The age distribution of respondents

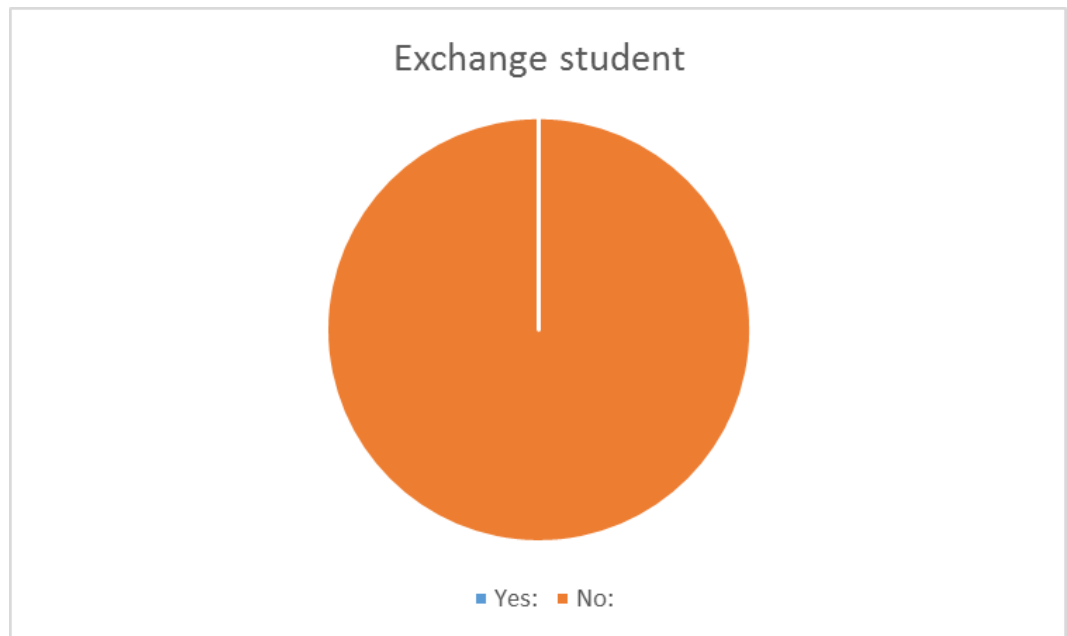
3. Are you an exchange student?

Figure 6.3. Exchange student status

6.2 Questions concerning open innovation

4. Which of the following aspects do you find most appealing (positive) about open innovation? (You may choose several)

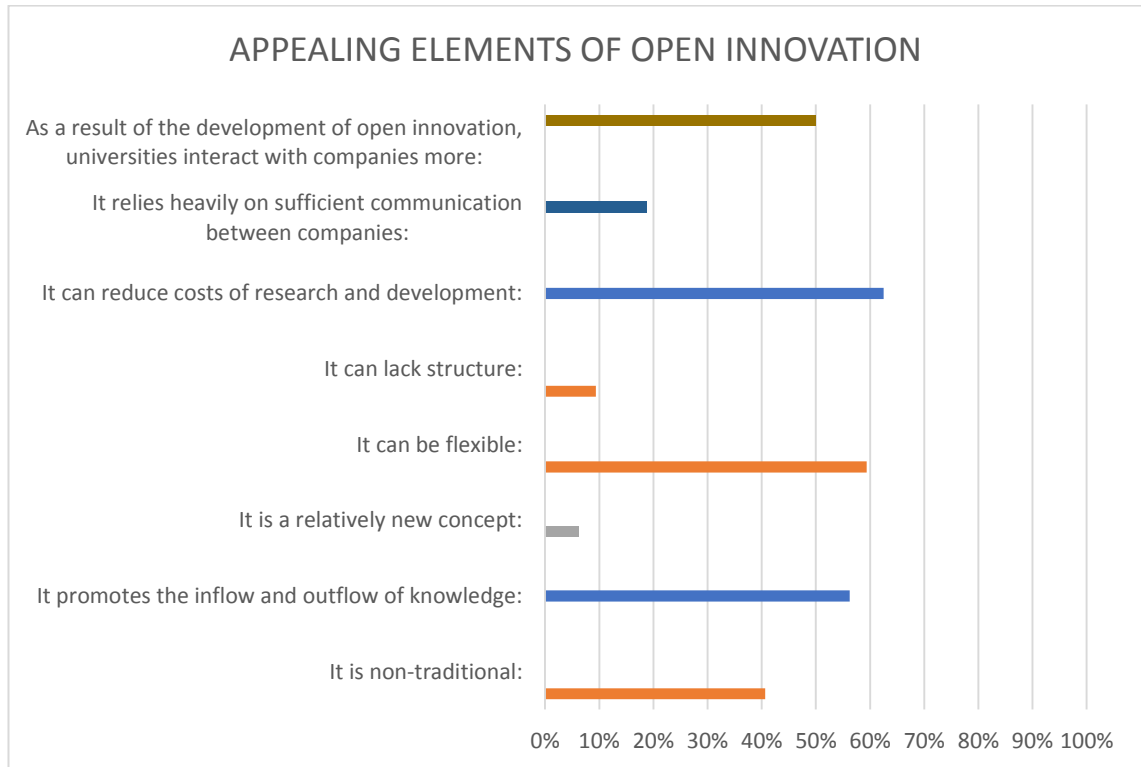


Figure 6.4. Elements students find appealing concerning open innovation

The element that the students find most appealing about open innovation is that it can reduce R&D costs (62,5%). This may indicate that most of the respondents are looking at this element from a management perspective, because from the perspective of the R&D department this might not be that appealing. As presented earlier, increasing the utilization of outside technologies can create negative feelings amongst resident researchers (Huston & Sakkab 2006).

Other highly appealing elements are the flexibility (59,4%) accompanying open innovation and the inflow and outflow of knowledge (56,3%). These attitudes suggest, that students value freedom and do not feel uncomfortable with the concepts of ambiguous boundaries and technology transfer.

5. Which of the following do you find to be the most unpleasant aspects of open innovation? (You may choose several)

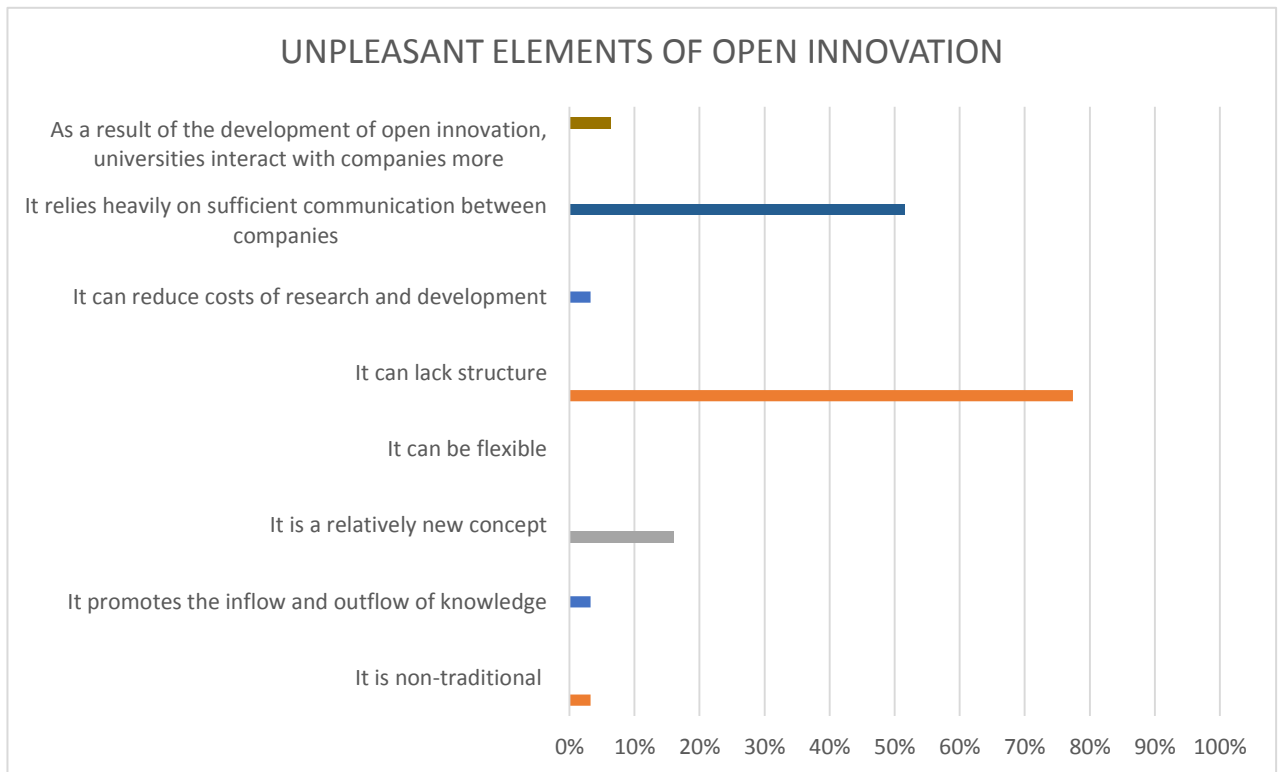


Figure 6.5. Elements students find unpleasant concerning open innovation

By far the most unappealing element of open innovation is found to be its lack of structure. This is quite interesting, considering that in order for innovation to actually happen, it requires (to a large extent) lack of structure. This suggests that even though students have a relatively positive view of open innovation, they feel uneasy with the organization style that may accompany it. Another element which stood out in this result, was reliance of communication between companies. This indicates that not-invented-here attitudes may exist amongst people who are yet to work in an open innovation environment.

6. Do you have anything specific that comes to mind, when considering open innovation? (optional)

Regarding this question, almost all of the answers raised the issue of open innovation being a new and developing method of transferring knowledge. Therefore it is considered to be difficult to define for now. Additionally, the issue of profit dividing and property rights came up, because in open innovation it may be difficult to define who creates what.

7. "A disruptive (negative) element of open innovation is the possible lack of structure"

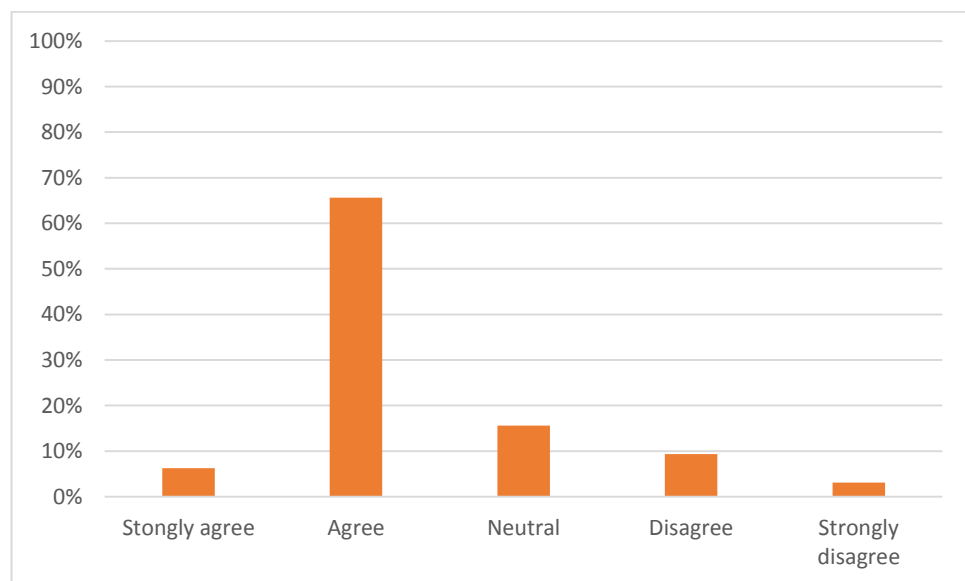


Figure 6.6. "Lack of structure is disruptive element concerning open innovation"

The result in question 7 proves that students feel uncomfortable with a lack of structure. A large 65,63% agree with the statement presented (and 6,25% strongly agree). This is fascinating considering how many work environments are shifting towards more horizontal models. But not all of the respondents feel that a lack of structure is unbeneficial. 9,38% disagree with the statement and 3,13 strongly disagree.

8. "An appealing (positive) element of open innovation is the possibility of creating something other companies can utilize"

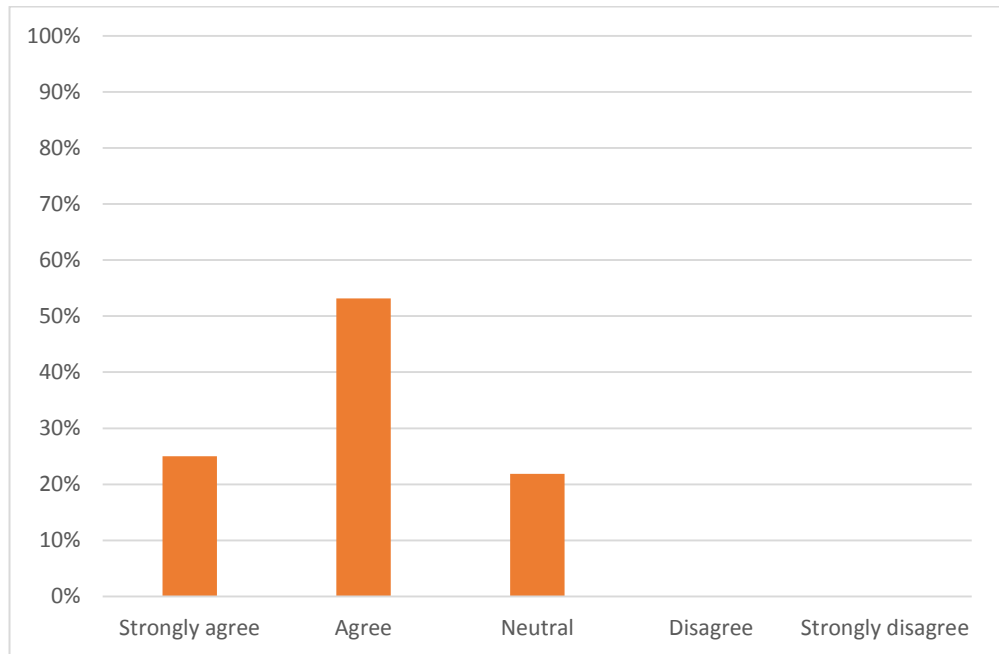


Figure 6.7. "Creating something other companies can utilize is appealing".

The students find the prospect of creating something that may be used elsewhere to generally be appealing. 53,13% of the respondents agree to the statement in question 8, and 25% strongly agree. This supports the notion that benefiting from idle technologies by selling or licensing them is looked upon with a positive attitude. The neutral opinions (21,88%) may indicate unwillingness to necessarily part from knowledge even though the prospects may be appealing.

9. Would you consider working for a company which would require you to use open innovation?

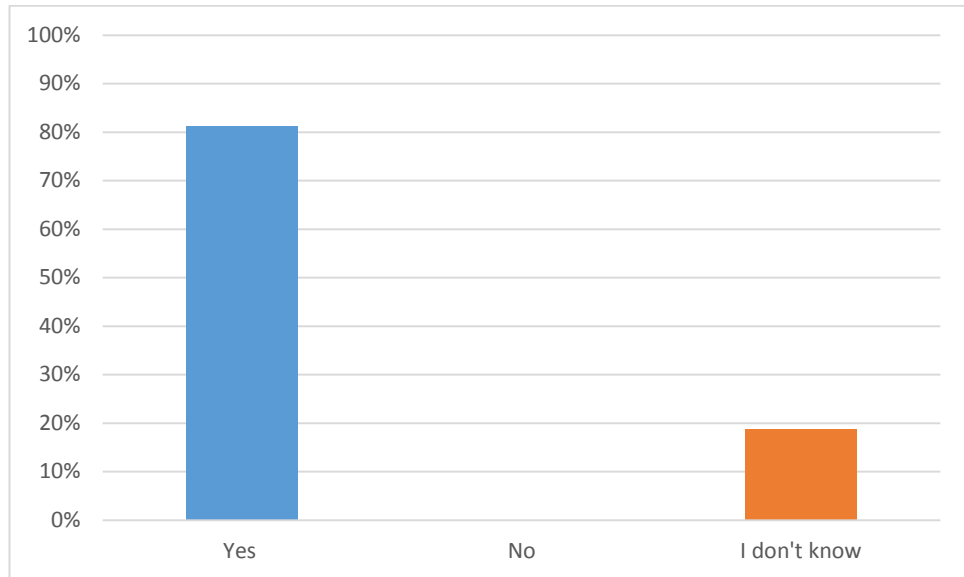


Figure 6.8. Would work for a company using open innovation

A majority of the students, 81,25%, would work in a company which would require them to use open innovation. 0% answered that they would not work in such a company, but 18,75% were not sure. This indicates that overall attitudes are positive regarding open innovation.

7 RESULTS AND CONCLUSION

This thesis sought out to find what kinds of attitudes students' have regarding open innovation, and what would be effective ways of attracting future employees based on these attitudes.

The research questions and objectives were:

1. What attitudes do students express towards open innovation environments?

→ Objective: To describe the attitudes and perceptions that students hold towards open innovation environments and try to determine where these attitudes stem from.

2. What are the components which have an effect on these attitudes?

→ Objective: To identify factors which influence attitudes and to try and determine whether some factors are more influential than others.

3. What kind of incentives could be used to increase motivation to work in an open innovation environment?

→ Objective: To establish what kind of incentives may attract employee candidates.

7.1 Main findings

Some of most prominent attitudes that students' had regarding open innovation were concerning the reducing of R&D costs, the flexibility of open innovation and the collaboration between universities and companies. These elements of open innovation were looked upon with a positive attitude.

The favorable attitudes towards reducing R&D costs, suggest that the influence of education in management has been present. As presented in chapter four, the shifting of R&D functions towards more of a “connect and develop” disposition may spark negative feelings amongst scientists and researchers (Huston & Sakkab 2006). But since the study was conducted on business and administration students, the perspective is different. For the subjects in question, managing costs and developing business models can be of higher priority.

The prospect of universities collaborating with companies more is also found appealing. Education background and cultural values of government and business interaction support this attitude. Also the statement of Kreitner & Kinicki (2010) that a modern employee is expected to be flexible, may influence expectations students reflect on themselves. Students in this day and age take it as a given that educational institutes and companies collaborate. This result may also indicate, that students value the chances for innovation that the collaboration may offer them. It would be highly interesting to follow up on these attitudes once the students have entered their career life. It would be fascinating to see if attitudes take a stronger shift to the not-invented-here syndrome, once the subjects are observing open innovation from a different perspective.

An intriguing finding of the research was, that the subjects found the flexibility of open innovation to be appealing yet found lack of structure disruptive. These attitudes may indicate strong influence of the social environment (see 4.1.1). The norms of our society help to mold our opinions and attitudes. Open innovation has been viewed as being a modern and efficient approach to business. But for students, after several years of guidance and instruction from teachers and the school environment, they may feel uneasy with the lack of structure that the freedom of open innovation can bring. This finding supports the theory that a lack of proper structure and decision-making metrics may cause unease amongst employees (Wilson 2010).

The reliance on comprehensive communication between companies was found as a disruptive element of open innovation. This was interesting when considering how much communication goes on constantly via social medias. Most cer-

tainly the attitude is not present due to a lack of communicational skills rather it may indicate a dislike of sharing possibly confidential information of a company with outsiders. This finding indicates that the not-invented-here syndrome presented in chapter four can already be appearing amongst students.

The research brings up valuable elements to take into account when developing incentives. Since attitudes of individuals and an effective rewarding system are main contributors to individual performance in innovation (Lee & Wong 2006), the recruiting process and reward system planning are crucial factors in developing efficient innovation.

The results of this research suggests that the development of flexible yet structured work environments will promote positive attitudes and further desirable outcomes. That is, allowing employees freedom and independence without forgetting to indicate structural design and expectations. The implementing of flexibility and freedom to develop innovation and connect with outsiders should be done incrementally, first relying on a more structured approach. Additionally, making an effort to create a work environment where the flow of knowledge is seen as an invaluable resource, is a necessity.

The use of intrinsic and extrinsic incentives should be thoroughly reviewed. This research suggests that since the positive attitudes are high regarding flexibility and collaboration, incentives appealing to social elements should be utilized.

7.2 Suggestions for Further Research

Very few studies have been made to examine the attitudes of individuals concerning open innovation. At the moment, studies and research have focused more on open innovation from the perspective of the organization or management.

In order to develop these work environments and structural elements that accompany open innovation, a true knowledge of the factors influencing the individuals behind open innovation is paramount. Especially since it has become increasingly common that companies are founded with an open business model in mind.

An intriguing research perspective could be studying the changes in attitude that come about from individuals transitioning from university to the business world.

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APPENDIX 1. QUESTIONNAIRE COVER LETTER

Dear fellow students,

I am Minna Darwish of Ninbos11, and I am writing my thesis about students' attitudes towards open innovation.

I would be truly grateful if you take a couple of minutes of your valuable time to fill out these 9 questions!

The survey is here:

<http://www.surveymonkey.com/s/N6FLRBK>

The survey is anonymous.

Thanks in advance and have a great summer!

Best regards,

Minna Darwish

APPENDIX 2. QUESTIONNAIRE FORM

Student's attitude towards open innovation

This survey is designed to find out students' attitudes towards open innovation.

A brief description of open innovation:

Open innovation challenges the traditional vertically organized developing of ideas and products. It places an emphasis on the inflow and outflow of knowledge between organizations. It has been expressed that even the most advanced organizations should create a dialogue with external knowledge resources in order to capitalize on innovation. (Chesbrough et al. 2006, 1-3).

1. Please indicate your gender:

- Male
 Female

2. Please indicate your age:

- 15-24
 25-34
 35-

3. Are you an exchange student?

- yes
 no

4. Which of the following aspects do you find most appealing (positive) about open innovation? (You may choose several)

- | | |
|--|---|
| <input type="checkbox"/> It is non-traditional | <input type="checkbox"/> It can lack structure |
| <input type="checkbox"/> It promotes the inflow and outflow of knowledge | <input type="checkbox"/> It can reduce costs of research and development |
| <input type="checkbox"/> It is a relatively new concept | <input type="checkbox"/> It relies heavily on sufficient communication between companies |
| <input type="checkbox"/> It can be flexible | <input type="checkbox"/> As a result of the development of open innovation, universities interact with companies more |

5. Which of the following do you find to be the most unpleasant aspects of open innovation? (You may choose several)

- | | |
|--|---|
| <input type="checkbox"/> It is non-traditional | <input type="checkbox"/> It can lack structure |
| <input type="checkbox"/> It promotes the inflow and outflow of knowledge | <input type="checkbox"/> It can reduce costs of research and development |
| <input type="checkbox"/> It is a relatively new concept | <input type="checkbox"/> It relies heavily on sufficient communication between companies |
| <input type="checkbox"/> It can be flexible | <input type="checkbox"/> As a result of the development of open innovation, universities interact with companies more |

6. Do you have anything specific that comes to mind, when considering open innovation?

7. "A disruptive (negative) element of open innovation is the possible lack of structure"

- Strongly agree Agree Neutral Disagree Strongly disagree

8. "An appealing (positive) element of open innovation is the possibility of creating something other companies can utilize"

- Strongly agree Agree Neutral Disagree Strongly disagree

9. Would you consider working for a company which would require you to use open innovation?

- Yes No I don't know