Chinese Business Review, Jan.-Feb. 2022, Vol. 21, No. 1, 19-40
doi: 10.17265/1537-1506/2022.01.004

# Crowdsourcing for Innovation and the Conduciveness of University Students—A University Case: Altinbas University

Zeynep Ayfer Bozat
Topkapi University, Istanbul, Turkey

Although the concept of innovation takes place in the list of what needs to be done in the institutions, it has started to get old and insufficient as everything getting old in time. Particularly, the lack of resources and the existence of a large number of competitors have led institutions and scientists to go one step further. The concept of open innovation has paved the way for the process of integration of innovation that occurs within the institution with the external sources. While searching for a variety of tools to use the concept of open innovation in the best and the most efficient manner, the method of crowdsourcing has stepped forward. This method is to benefit from the experience and intelligence of the crowd which is the most important factor. The purpose of this study is to introduce the concept of crowdsourcing in details and to prove that university students are a suitable type of crowd for this method.

*Keywords:* innovation, open innovation, crowdsourcing

## Introduction

Innovation continues to be one of the most popular and the most ambiguous concepts of recent times. While the necessity of innovation has been considered by all states and sectors, the best ways of innovating are constantly being explored by scientists. Innovation, in its simplest form, has been defined as transforming new ideas into the economy. However, as time progresses and technology advances, traditional innovation is no longer enough and new initiatives have been started to be tested. Scientists have been pegging away at moving innovation to a more advanced level. The purpose of this study is to determine the way innovation has progressed while defining it. The transition from innovation to open innovation, and finally to the crowdsourcing, has been narrated; a university student population from Turkey has been taken as the sample; the availability of the university student population for crowdsourcing has been investigated through the survey. Being conducted at a single university can be viewed as the limitation of the study.

## Literature Review

### The Concept of Innovation

The word innovation comes from the word “innovare” in Latin which means “renew, do something new, make a change”. Although the word “innovation” is in common usage, it has been used a lot in many articles. Definitions differ in various ways (Narayanan, 2001, pp. 1-3).

Zeynep Ayfer Bozat, Ph.D., Asst. Prof., Department of Business Administration, Faculty of Economics and Administrative Sciences, Topkapi University, Istanbul, Turkey.
Correspondence concerning this article should be addressed to Zeynep Ayfer Bozat, Topkapi University, Istanbul, Turkey.

Innovation has also been defined as transforming new ideas into the economy. A simple formulation of innovation was made in the following way: Innovation = theoretical concepts + technical innovation + commercial application.

Table 1

*Definitions of Innovation*

| Author | Definition |
|---|---|
| *Oslo Manual* (2005) | "The realisation of new or significantly improved product (goods or services) or process, a new marketing method, or a new organizational method in business practices, in a workplace organisation or in external relations". |
| Peter Drucker (1998) | "Innovation is a tool for the entrepreneur to create new wealth-producing resources or to increase the wealth-producing potential of the existing resources". |
| Tidd & Bessant (2005) | "The process that ideas are transformed into useful and used new products, processes and services". |

Schumpeter has divided the process of a product which would enter the market into three phases including invention, innovation, and diffusion (Smith, 1998, pp. 1-3): invention: the process of discovery of a new technical discipline conducted by the scientists; innovation: the process of commercialisation of an invention carried out by the entrepreneur; diffusion: the spread of innovation in the commercial use.

Today, concept of innovation reflects the entirety of three-stage process which Schumpeter referred to. According to Schumpeter, opening new markets, the presence of new production sources, Taylorism of the study, developments in the style of processing of materials, the use of new business management and organization models, briefly "things to be done differently" points to technological developments in the production of the goods and this development is covered by the concept of innovation.

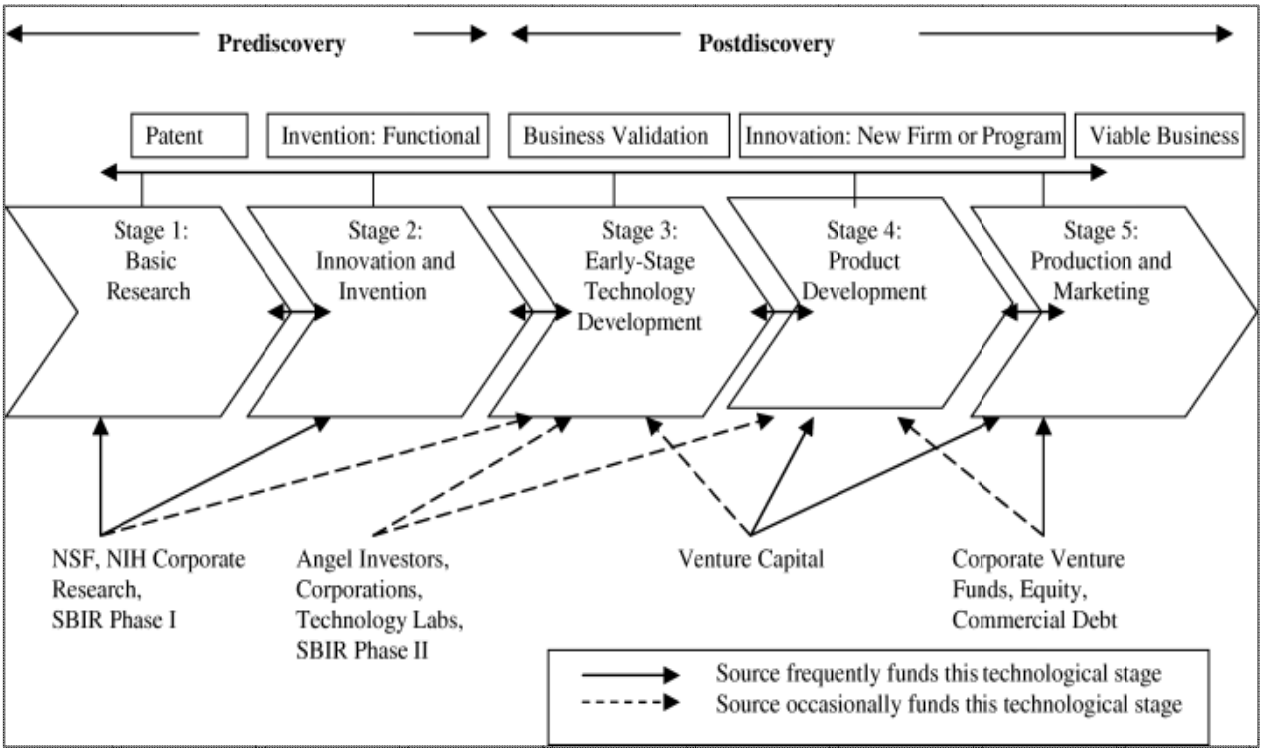


*Figure 1.* The sequential model of innovation and commercialisation. Source: Khilji, Mroczkowski, & Bernstein, 2006.

Khilji, Mroczkowski, and Bernstein (2006) have put the process of innovation and its commercialisation in a figure as above. Figure 1 illustrates how commercial competence becomes valuable and how it rules the stages after invention—that is to say, when an invention becomes available. Resources and activities should then be steered in the direction of the commercialisation of new products to build a proper business and make a profit. Talking about business innovation had started when Professor Clayton Christensen steered the businesses to follow the path of destructive innovation or sustainable innovation in order to achieve business growth at the end of the 1990s. While in a hurry to innovate, organisations have followed the path of open innovation or crowdsourcing which has been being still talked about by communities. In the previous trends of innovation, there have been methods for or methodologies for managing the development of new products along with original problem-solving methods. None of these methodologies were adapted to the internet age, nor were replicated for the mass innovation needed in the information age. Because most of the leaders have been unaware of the traditional (usual) innovation and the new methods have not been optimized, there is a need for a model for a systematically improved system to bring the change into the corporate culture and to make it ready for innovation and for collective adaptation to the information-saturated age of information (Gupta, 2011, p. 144).

**Open Innovation**

Innovation is vitally important that more and more regarded as a phenomenon worthy of social and economic research. Companies are concerned about their ability about the innovation, especially their abilities related to their competitors, because they think that their future might depend on it (Howe, 2006, p. 2).

However, the innovation process in many companies makes cough sound like a rusty old engine. Just as the internal combustion engine, because the parameters have changed completely, traditional innovation's time also is about to up (Prahalad & Mashelkar, 2010, pp. 1-3). As communication facilities and technological opportunities increase, the level of competition of the companies has also been increasing. The increasing level of competition persuades firms to differentiate the products, and this situation brings the pros of the R & D costs. The increase in the cost of production which information that is required for development within the enterprise will generate requires the flow of information from the outside. In innovation, provision of information from internal and external sources by moving beyond the traditional business association has a significant role in increasing the innovative capacity of the firm (Linton & Walsh, 2004, p. 522).

Innovation efforts may be enough in a market environment where uncertainty and variability are limited. However, if there is uncertainty and variability, if the firm enters a stranger market, or if a stranger product starts to be produced, you will need to show more effort to see the opportunities and threats before us (Chesbrough, 2004, p. 25). The increase of uncertainty and volatility in the market with the need for information forces businesses to move beyond the concept of innovation and makes internal R & D activities insufficient. This has led to the emergence of the concept of open innovation by moving beyond innovation. Open innovation is the provision of valuable information in and out of the business in order to accelerate internal innovation and is to make markets use innovation as exogenous (Chesbrough, 2006, pp. 1-3). In fact, open innovation is often defined as the use of external markets and is considered as its equivalent (Felin & Zenger, 2014).

According to Chesbrough and his friends, the array of the values of open innovation can be considered as the antithesis of the traditional vertical integration model where the firm develops inner products with internal

R & D activities, and then these products are distributed by the company. Open innovation is the range of values assumes that firms can use and should use external ideas as well as internal ideas and internal and external market paths while attaching importance to advancing the technologies of firms. While the business model states that endogenous mechanisms demand a portion of the value created, gains favour with creating value from both external and internal ideas. At the same time, open innovation assumes that the inner ideas can be marketed through external channels beside the firm's existing businesses to create added value (Chesbrough, Vanhaverbeke, & West, 2008, pp. 1-3). In terms of the shape and the time of the emergence of new solutions, the relationship between the compatibility of the external resources and things a company can do coming to end with innovation practices in the literature of innovation has come a long way (Faludi, 2014, p. 35). The scientists who deal with open innovation have focused on the need of focal organisations to go beyond the boundaries by providing information from the outside Felin and Zenger (2014), who have contended that environmental uncertainty and the complexity of the reunification of innovation and knowledge lead to the increase in the permeability of organizational boundaries and lead to the need of organisations to interact with their environment and external stakeholders in more ways. The concept of open innovation covers a wide range includingexternal actors, users, customers, suppliers, competitors, and universities. Underlie mechanisms of encouraging access to external information and open innovation coverseveral alternatives including respectively, the competitions and tournaments, alliances and partnerships, corporate venture capital, licensing, open source platforms, and various development communities (Walter, 2014, pp. 1-3).

**The Concept and the Scope of Crowdsourcing**

In the past decades, the world has experienced technological and social changes where information has spread much faster. Mankind today is faced with several daunting challenges, demanding drastic solutions: climate change, global pandemics, failing states, drug crimes, terrorism, the expansion of nuclear power, the destruction of nature. We need to find novel innovation systems in order to cope with these challenges. We must learn how to fix multi-faceted and controversial issues. In the early 20th century, Thomas Edison and General Electric have created the modern R & D lab and a series of protocols which will help to produce a technological progress which has been imitated very much, covering a century in a value. Today, mankind's most poignant problems are not technological in nature; in social, cultural, and political nature and in a global dimension. Therefore, we need to innovate steadily as Edison did. Luckily, there are new meta-innovations such as idea markets, crowdsourcingm and folksonomy that allow us to innovate between disciplines, boundaries, institutions, and ideologies (Hamel, 2014, pp. 1-3).

The creation of outsourcing processes and company networks become useless considering the new age in organisational field. In the new framework, the use of mechanisms such as crowdsourcing defined as getting the external source from the crowd and what we have defined as the capabilities of the mass related to the organization and the acquisition, the management and use of what we call "mass capital" is a response to new changes (Garrigos-Simon, Gil-Pechuán, & Estelles-Miguel, 2015, p. 3). Crowdsourcing is a concept invented by Jeff Howe in 2006 (Howe, 2006, p. 2) and has attracted considerable attention of researchers and practitioners. Unless otherwise, it refers to the use of crowds/communities to solve problems which are expected to be resolved by internal and external customers (Brabham, 2008a, p. 82). Crowdsourcing is a tool to organize and coordinate individuals in the labour force. The internet and computer software are used to contact individuals, to offer something to them and to collect the results of the work (Grier, 2013, pp. 1-3).

Crowdsourcing requires four different elements: (1) the person managing the process and generally called the crowdsourcer (individual-crowd manager managing the workforce of communities), (2) a group of people doing the job and called the crowd, (3) a market the crowd manages the contributions of communities and known as crowdmarket. Crowd-markets are usually found on the internet sites called crowdsites or platforms, (4) a communication tool for communicating with the crowd (usually the internet).

Estellés-Areolas and Gonzalez-Ladron-de-Guevara (2012) in their literature review identified eight basic elements within 40 different definitions. These elements are as follows: A clearly defined crowd is available; a task with a clear goal is available; a clearly defined remuneration to be received by the crowd is available; the crowdsourcer is clearly defined; the task/job which will be taken in return by the crowdsourcer is also clearly defined; uses an explicit call to a variable extent; uses the internet.

Grier (2013) asserts that the internet reduces the isolation that is caused by the geography and it provides the ability to reach more people with a wider range of talent.

In light of these, Estellés-Areolas and Gonzalez-Ladron-de-Guevara (2012) have made the definition of crowdsourcing as follows:

> It is an online type of activity in which tasks are taken voluntarily through a flexible open call by a variety and a number of individuals with different information who are offered by an institution, a non-profit or a profit company. Undertaking tasks with variable complexity and infrastructure and allowing participation by bringing their jobs, their money, their information and/or experiences always requires mutual benefit. While the crowdsourcer has the thing that the user has brought into the interference which is shaped depending on the type of the activity carried out and makes advantage of it through their interests, and the user satisfies one of their certain need either for economic or social recognition, self-respect, or the development of individual skills. (p.196)

The other definitions for crowdsourcing in the literature can be collected in a table as follows:

Table 2

*Definitions of Crowdsourcing*

| Author | Definition |
|---|---|
| Howe (2006) | "If it happens to be simply defined, crowdsourcing represents the action of transferring a job that is performed by a company's employees to a (and usually a large) network of people". |
| Howe (2009) | "Crowdsourcing is the action of transferring a job from a designated agent (usually an employee) who fulfils the job traditionally to an undefined, usually a large human crowd". |
| Brabham (2013) | "Crowdsourcing is an online, distributed problem solving and a production model which uses the collective intelligence of online communities to the last in order to serve certain organisational goals". |
| Oliviera et al. (2009) | "It is a form of handing over the tasks that are for intellectual asset creation to the crowd often in cooperation for the purpose of easier access to a wide range of skills and experiences". |
| Vukovic (2009) | "It is a new online, distributed problem solving and production model where people who are connected to a network, cooperate to complete a task". |
| Sloane (2011) | "It is a particular manifestation of open innovation. It is the act of transferring a task to a group of people outside of the organization, usually by making an explicit call. It is an open-source philosophy that uses a wide range of 'crowd' of developers to build the Linux operating system". |
| Whitla (2010) | "Crowdsourcing defines the process of company's organising a workforce which they divided among a kind of a crowd (usually online) by proposing to make a payment to everyone in 'the crowd' that accomplishes the task determined by the company". |
| Saxton et al. (2013) | "Crowdsourcing a sourcing model which used by organisations by using advanced internet technologies predominantly to benefit from the efforts of a virtual crowd in order to accomplish certain organisational tasks". |

Source: Sanz-Blas, Tena-Monferrer, & Sánchez-García, 2015.

Crowdsourcing, as shown in Figure 2, can be best understood at the intersection of three factors: "the crowd", outsourcing and advanced internet technologies (social networks).

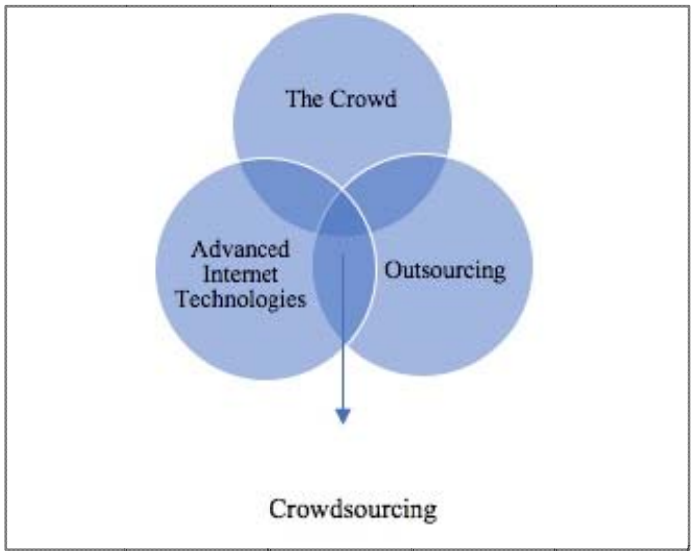


*Figure 2.* The three factors that define crowdsourcing. Source: Saxton, Oh, & Kishore, 2013.

According to Jayanti (2012), crowdsourcing can be divided into three basic types: crowdsourcing for content, crowdsourcing from the technical perspective, and crowdsourcing for the competition.

**Crowdsourcing for content.** Crowdsourcing for content organizations occurs when organisations are connected to users directly to produce content. Users are paid very little, or they do not receive any compensation and they rarely could compete for larger payments. It occurs in both for-profit and non-profit organisations.

**Crowdsourcing from the technical perspective.** It occurs when organizations want to take advantage of external sources for the technical, non-strategic processes which probably have gone to the contracted parties before.

**Crowdsourcing for competition.** It occurs when organizations persuade the very talented participants-usually in the fields of R & D, management or advertising—to compete the company's strategic or fundamental works with a technical review of the solution and the chance of a reward. Since it requires a certain level of expertise, this group of participants can be seen considered as a core workforce of highly by chance (Jayanti, 2012, p. 382).

**The Definition of Crowd**

Gustave Le Bon (2002) defines crowd in his work called "The Psychology of Communities" which was first published in 1912, as follows:

> The word "crowd", whatever it is that brings them together, represents a collection of individuals. From a psychological perspective, however, the crowd takes on another meaning. It is the emergence of new and very different characteristics by the combination of each individual that comprise it in certain circumstances, and only in these circumstances. (p. 2-3)

James Surowiecki (2005) specifies that not all the crowds are wise and highlights that the criteria located in the table below (Table 3) have separated intelligent communities from the irrational ones.

Table 3

*Intelligent Crowd Criteria*

| Criteria | Explanation |
|---|---|
| Variety of ideas | Even though it is just an unusual interpretation of the known facts, each person must have a special knowledge of self. |
| Independence | People's ideas are not determined by the opinions of other people around them. |
| Decentralization | It is possible for people to specialize and to benefit from local knowledge. |
| Getting together | Some mechanisms exist to convert the special provisions to a joint resolution. |

Source: Surowiecki, Gardner, & Audio, 2004.

Oinas-Kekkonen (2008) reflects the following eight assumptions on the wisdom of crowds based on Surowiecki's (2005) book: (1) It is possible to explain how people within a group think bodily. (2) In some cases, the groups are highly intelligent that they are cleverer than even the most intelligent people in the group. (3) For a group to be smart, three conditions are required: (a) diversity, (b) independence, and (c) decentralization. (4) The best decisions are the products of disagreement and contest. (5) Too much communication makes a group less intelligent as a whole. (6) The function of collecting information is required. (7) The right information must be delivered to the right people in the right place at the right time and in the right way. (8) There is a need to pursue experts. Lebraty and Lobre-Lebraty (2013) suggest that members of a crowd participate in the operations of crowdsourcing for two reasons: passion and interest. Crowdsourcing requires reaching a crowd that is compatible with the innovation you are trying to develop. This principle is associated with choosing the right crowdsourcing model. You must choose the right people for the right model (Howe, 2009, pp. 1-3). If someone in the group does not have the right experience, the right skills or the right connectionsin terms of the problem or task, that person cannot give anything to add value (Grier, 2013, pp. 1-3).

**The different types of crowd.** There are two types of innovation that the crowd can be benefited from (Grier, 2013, pp. 1-3):

Public crowds: Public crowd meets up with a public invitation. It can be comprised of the people who visit the website.

Private crowds: Private crowd begins with a group of people you already know.

Both types of crowd are divided into two classes more:

Open crowds: In open crowds, everyone who came can be taken as a member of the crowd.

Regular crowds: In regular crowds, membership can be limited with people who have specific experience, skills, or attitudes.

**Crowdsourcing Process**

Crowdsourcing is evaluated as a distributed problem-solving model (Brabham, 2008). In this model, the problem opens to the anonymous crowd through an open call; people come, and work on tasks, submit their solutions and they receive incentives offered on that platform. The architecture of crowdsourcing consists of three main components: platform, application, and community (L. Zhang & H. J. Zhang, 2011, p. 3). Platform will be the stage where the crowdsourcing application is conducted; the application includes all the tasks that are directed to the crowds and the crowd points out the people that will contribute to the solution of problems. A request is placed on the crowd market to source the crowd. A piece of information, an idea for a new product,

a business, a big task, and even a track of contribution can be requested. Kinds of benefits are offered in return. They can be paid for their service, they can be offered gratitude, a gift can be given, or a membership to a society may be provided (Grier, 2013, pp. 1-3).

This architecture can be modeled as in Figure 3.

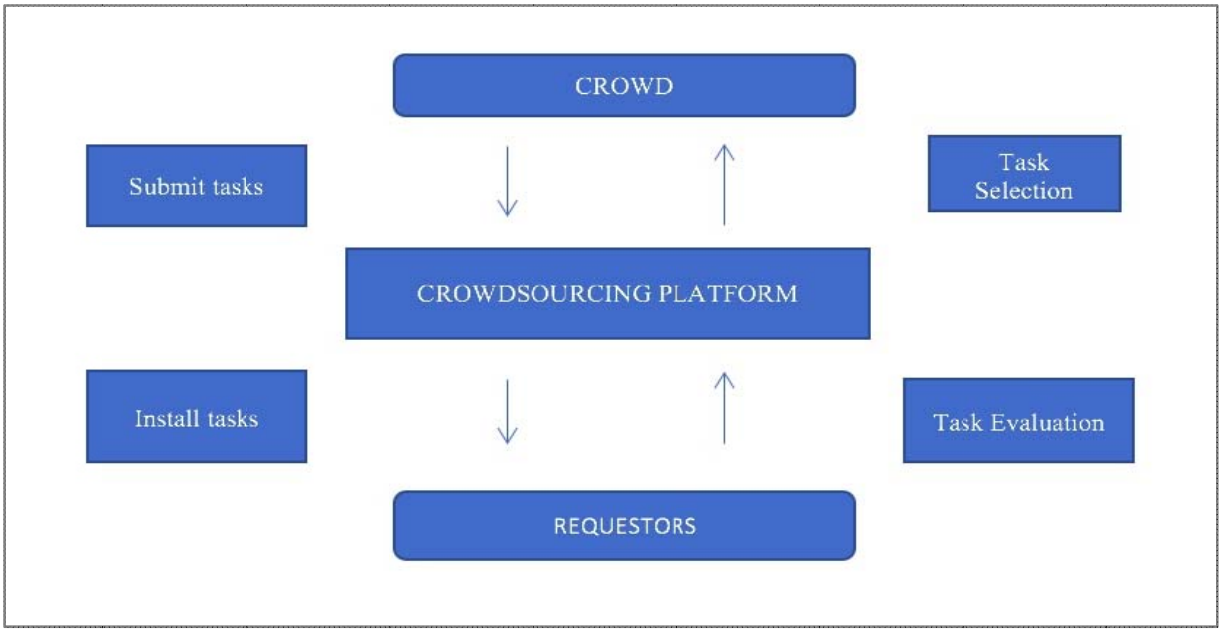


*Figure 3.* The architecture of crowdsourcing. Source: Thawrani, Londhe, & Singh, 2014.

Crowdsourcing platform acts as a link between the requestors and the crowd. It is the only way of interaction of the crowd and requestors. Requestors install the problem to the platform, pass it to the crowd; the crowd selects the problem and solves it and submits to the platform where the requesters access to the solution and evaluate it. A requestor is a formation that submits the request for a task and starts the process of crowdsourcing. Crowdsourcing platform is a reliable tool that allows these communities to successfully complete the task requests. Crowdsourcing platform may execute crowdsourcing requests in a number of different ways such as by doing ads of requests in the market, by allowing providers to bid on requests or presentation of the petitioner in the election of the winner of the competition will use a set of criteria in the format of a competition in which the requestor sets the criteria that will be used to select the winner submission. Requestors install the task on which they want the process of crowdsourcing to be executed, to the platform; they work on the selected task and submit back to the platform. The submitted solutions are evaluated by requestors (Thawrani, Londhe, & Singh, 2014, p. 250).

Just because the money was not used in the process as in the usual way, it does not mean that it's not a crowd market. Even though employees are voluntary, they receive something in return. They may be satisfied because they can use their skills, they may take pleasure in being able to be a part of a group, or they may have the feeling of being able to contribute to something bigger than they are. One of the best examples of this is Wikipedia. Almost all of the employees are composed of volunteers, and they do not work for money. Still, they are a part of a transaction in a market. They offer their contributions to the Wikipedia encyclopaedia and even if their words become an encyclopaedic fixture, they do not receive any compensation for this.

Nevertheless, each person experiences some sort of satisfaction for contributing to a common corpus of human knowledge (Grier, 2013, pp. 1-3).

**Types of Crowdsourcing**

Crowdsourcing may occur in many different ways. It can be performed with people in large groups, with small teams and even with individuals. It can be benefited from the people who live near or on the other end of the planet. Through crowdsourcing, the intellectual and creative abilities of individuals or their physical strength can be used, or you may demand money.

Grier (2013) and Estellés-Areolas and Gonzalez-Ladron-de-Guevara (2012) suggest that there are six main types of crowdsourcing: crowdcontests or crowdcasting; crowdcollaboration; crowdcontent; self-organizing crowd; crowdfunding; crowdopinion.

**Crowdcontests or crowdcasting.** It is a type of crowdsourcing similar to a contest where the problem or task is directed to the crowd and the best solution or the first solution offered is rewarded (Estellés-Arolas et al., 2015, p. 40). In this type, there is an undivided, single job and it is given to a single person to complete the job, Because that person is trusted mainly, and the best possible person is asked to do the job. Therefore, crowd members are asked to submit their best and competition is established between them. The person who makes the best submission is elected and that person is rewarded for it (Grier, 2013, pp. 1-3).

**Crowdcollaboration.** It is a type crowdsourcing where the process occurs among individuals and the crowd while the one has started the process remained on the side-lines (Estellés-Arolas et al., 2015, p. 40). Each job is divided into specific, large parts that require special skills. Each piece is given to members with these special abilities within the crowd. The one offering the job manages the process and pays those who do the job. It can be said there are two sub-types with different ultimate goals (Estellés-Arolas et al., 2015, p. 40);

***Crowdstorming.*** They are giant sized online brainstorming sessions where different ideas are produced, and the crowd supports these ideas by their votes and comments.

***Crowdsupport.*** In this type, customers settle the doubts and problems of other customers so that they do not need official customer support.

**Crowdcontent.** In its simplest form, crowdsourcing is a way of connecting organizations to potential employees via the Internet. Crowdsourcing especially appears to be a good way to assign small tasks which are called crowd-contents (Brabham, 2013, pp. 1-3). In such crowdsourcing tasks, the information or the labour force which is required to find or create content in a variety of ways is used in a non-contest way (Estellés-Arolas et al., 2015, p. 40). The job is divided into open, small tasks to involve more members from the crowd and to get the job done more quickly. Each submission is evaluated without the capabilities of potential employees who are being seen or before interviewing with them and the appropriate ones are accepted. Then the members of the crowd, who have done the job for you, are paid (Grier, 2013, pp. 1-3). It can be said that this type of crowdsourcing has got three subtypes (Estellés-Arolas et al., 2015, p. 40):

***Crowd production.*** Since tagging images and translating small texts are individual jobs, the crowd needs to create content in this type of crowdsourcing. E.g. Amazon Mechanical Turk and Wikipedia.

***Crowd investigation.*** It is a crowdsourcing type in which the crowd makes a research over the Internet for any purpose. E.g. Peer to Patent Review.

***Crowd analysis.*** It is a crowdsourcing type in which the crowd makes research not over the Internet but on multimedia documents such as video or images.

**Self-organizing crowd.** The crowd decides how to divide the job. A prize is offered for the person or the group that will do the job best. A deadline is determined, and the crowd is allowed to work. When the deadline arrives, different submissions are reviewed; the best of them is selected and rewarded (Grier, 2013, pp. 1-3). For years, it has been the most widely used format of crowdsourcing for innovation.

**Crowdfunding.** It is sort of a funding model that individuals use the Internet to contribute a relatively small amount of money in the creation of a particular product or in investing a particular business idea (Brabham, 2013, pp. 1-3). It can be defined as a resource that enables a person who starts a project to obtain financing from internet users. This funding may contain all or a part of the capital needs of the one who has started the project (Lebraty & Lobre-Lebraty, 2013, pp. 1-3). In this type, an individual, an organization, or a company demands a fund from the crowd in return for a reward (Estellés-Arolas et al., 2015, p. 40). This model at the same time works for early stage companies seeking crowd fund for angel investors and for small business loans (Brabham, 2013, pp. 1-3). The crowd is used for the purpose of raising money for a company, a charity, or an artistic work. So to say, a hat is extended to the crowd and is asked to donate or equities are sold to collect money for a company.

**Crowd opinion.** The purpose of this type is to learn the user's thoughts about a particular problem or product through votes, comments, tags, and even the sale of the shares (Estellés-Arolas et al., 2015, p. 40). It contains projects that are aimed at feedback from users about a specific topic or product which the participants contribute with their ideas or assessments. If it's done by voting, it is called crowd-voting (Estellés-Arolas et al., 2015, p. 40).

## Research Methodology

### The Aim of the Study

The aim of this study is to explain the open innovation which is a newer concept and to provide a better understanding of the concept of "Crowdsourcing" which is a tool of open innovation within the framework of innovation. Within this context, the goal of the study is to reveal the availability of university students as a crowd which is the most important source of crowdsourcing method.

### Research Method

Literature review has been made on innovation, open innovation and crowdsourcing; the qualitative part of the study has been revealed from national and international sources. The quantitative part of the study has been formed according to the survey results obtained from Altinbas University students. The scale of the survey has been formed by the researcher due to the lack of scales on this subject. The results of the survey have been evaluated by considering frequency distributions and the hypotheses were interpreted based on five variables (gender, age, class, type of academic unit, and type of education).

### The Study Sample

Altinbas University students have been appointed as the sample of this study to represent the university students in Turkey. The university was established in 2008 and accepted its first students in the academic year 2011-2012. Altınbaş University has got eight faculties (Dentistry, Pharmacy, Fine Arts and Design, Law, Economics, Administrative and Social Sciences, Engineering and Natural Sciences, Faculty of Medicine), three institutes (Physical Sciences, Social Sciences, Health Sciences), and two vocational school (Vocational School,

Vocational School of Health Services) with 23 undergraduate degree, 19 associate's degree, six Master's degree programs, and two doctorate programs.

**Hypotheses of the Study**

Hypothesis 1: There is a significant relationship between the views on intellectual activities and gender.

Hypothesis 2: There is a significant relationship between the views on intellectual activities and age.

Hypothesis 3: There is a significant relationship between the views on intellectual activities and academic unit.

Hypothesis 4: There is a significant relationship between the views on intellectual activities and class.

Hypothesis 5: There is a significant relationship between the views on intellectual activities and the type of education.

## Results

The data obtained in the study were analysed with the help of SPSS (Statistical Package for Social Sciences) 22.0 for Windows. Numbers and percentages were used for data analysis, as descriptive statistical methods. The relationship between the views on intellectual activities and descriptive properties has been tested by chi-square analysis. Findings have been evaluated at a significance level of 5% with 95% confidence interval.

Table 4

*The Distribution of Descriptive Characteristics of Students*

| | Groups | Frequency (n) | Percentage (%) |
|---|---|---|---|
| Gender | Female | 304 | 67.6 |
| | Male | 146 | 32.4 |
| | Total | 450 | 100.0 |
| Age | 18-20 | 271 | 60.2 |
| | 21-23 | 159 | 35.3 |
| | 24+ | 20 | 4.4 |
| | Total | 450 | 100.0 |
| Unit | Faculty | 202 | 44.9 |
| | Vocational school | 248 | 55.1 |
| | Total | 450 | 100.0 |
| Department | Justice | 15 | 3.3 |
| | Computer Programming | 20 | 4.4 |
| | Child Development | 57 | 12.7 |
| | Foreign Trade | 29 | 6.4 |
| | Graphic Design | 22 | 4.9 |
| | Occupational Health and Safety | 31 | 6.9 |
| | Business Administration | 10 | 2.2 |
| | Jewelry and Jewelry Design | 1 | 0.2 |
| | Health Institutions Administration | 20 | 4.4 |
| | Social Services | 33 | 7.3 |
| | Civil Aviation and Cabin Services | 13 | 2.9 |
| | Pharmacy | 4 | 0.9 |
| | Law | 31 | 6.9 |
| | Graphic Design (Bachelor) | 2 | 0.4 |

Table 4 to be continued

| | | | |
|---|---|---|---|
| | Interior Architecture and Environmental Design | 7 | 1.6 |
| | Fashion and Textile Design | 12 | 2.7 |
| | Jewelry Design | 12 | 2.7 |
| | Economy | 3 | 0.7 |
| | Business Administration (Bachelor) | 4 | 0.9 |
| | Political Science and Public Administration | 9 | 2.0 |
| | International Relations | 10 | 2.2 |
| | International Logistics Management | 2 | 0.4 |
| | International Trade | 3 | 0.7 |
| | Psychology | 12 | 2.7 |
| | Sociology | 17 | 3.8 |
| | Computer Engineering | 19 | 4.2 |
| | Electrical and Electronics Engineering | 12 | 2.7 |
| | Industrial Engineering | 7 | 1.6 |
| | Civil Engineering | 14 | 3.1 |
| | Mechanical Engineering | 7 | 1.6 |
| | Architecture | 8 | 1.8 |
| | Basic Sciences | 1 | 0.2 |
| | Medicine | 2 | 0.4 |
| | Dentistry | 1 | 0.2 |
| | Total | 450 | 100.0 |
| Class | Preparation class | 22 | 4.9 |
| | 1st year | 200 | 44.4 |
| | 2nd year | 126 | 28.0 |
| | 3rd year | 66 | 14.7 |
| | 4th year | 36 | 8.0 |
| | Total | 450 | 100.0 |

Hypothesis 1: There is a significant relationship between the views on intellectual activities and gender.

Table 5

*The Relationship Between the Views on Intellectual Activities and Gender*

| | | Female | | Male | p | |
|---|---|---|---|---|---|---|
| | | n | % | n | % | |
| Willingness to participate in intellectual activities | Yes | 255 | 83.9 | 107 | 73.3 | $X^2 = 7.037$ |
| | No | 49 | 16.1 | 39 | 26.7 | $p = 0.006$ |
| Reward expectation in intellectual activities | Yes | 231 | 90.6 | 91 | 85.0 | $X^2 = 2.355$ |
| | No | 24 | 9.4 | 16 | 15.0 | $p = 0.090$ |
| The expected reward type in intellectual activities | Material | 174 | 68.2 | 86 | 80.4 | $X^2 = 5.488$ |
| | Immaterial | 81 | 31.8 | 21 | 19.6 | $p = 0.012$ |
| The expected reward content in intellectual activities | Money | 68 | 26.7 | 49 | 45.8 | |
| | Scholarship | 65 | 25.5 | 16 | 15.0 | |
| | Book support | 6 | 2.4 | 1 | 0.9 | |
| | Food support | 7 | 2.7 | 4 | 3.7 | $X^2 = 19.981$ |
| | Computer-tablet-mobile phone | 8 | 3.1 | 5 | 4.7 | $p = 0.006$ |
| | Internship-job opportunity | 77 | 30.2 | 30 | 28.0 | |
| | Travel-vacation | 21 | 8.2 | 2 | 1.9 | |
| | Gift vouchers depend on the company's products | 3 | 1.2 | 0 | 0.0 | |

Table 5 to be continued

| | | | | | | |
|---|---|---|---|---|---|---|
| Type of companies preferred for providing ideas | Food | 39 | 15.3 | 19 | 17.8 | $X^2 = 23.296$ p = 0.000 |
| | Cloth | 93 | 36.5 | 19 | 17.8 | |
| | Informatics | 46 | 18.0 | 36 | 33.6 | |
| | Media | 51 | 20.0 | 14 | 13.1 | |
| The preference of the way of receiving the call to provide ideas | Bank | 13 | 5.1 | 7 | 6.5 | $X^2 = 6.786$ p = 0.148 |
| | Automotive | 13 | 5.1 | 12 | 11.2 | |
| | E-mail | 151 | 59.2 | 57 | 53.3 | |
| | SMS | 63 | 24.7 | 25 | 23.4 | |
| | University web site | 11 | 4.3 | 10 | 9.3 | |
| | Banner | 8 | 3.1 | 1 | 0.9 | |
| | Stand at the university | 22 | 8.6 | 14 | 13.1 | |
| Willingness to announce their names once their ideas have been approved | Yes | 221 | 86.7 | 87 | 81.3 | $X^2 = 1.705$ p = 0.127 |
| | No | 34 | 13.3 | 20 | 18.7 | |
| Preference on the way of announcement of their names | Company web site | 102 | 46.2 | 41 | 47.1 | $X^2 =$ 13.355 p = 0.010 |
| | University web site | 60 | 27.1 | 10 | 11.5 | |
| | Television ad | 31 | 14.0 | 24 | 27.6 | |
| | Paper ad | 6 | 2.7 | 2 | 2.3 | |
| | Billboard | 22 | 10.0 | 10 | 11.5 | |

There has been a significant relation between gender and willingness to participate in intellectual activities ($X^2 = 7.037$; $p = 0.006 < 0.05$). There has been no significant relation between gender and the expectation of a reward ($X^2 = 2.355$; $p = 0.090 > 0.05$). There has been no significant relation between gender and the expected reward content in intellectual activities ($X^2 = 5.488$; $p = 0.012 < 0.05$). There has been a significant relation between gender and content of the expected material reward in intellectual activities ($X^2 = 19.981$; $p = 0.006 < 0.05$). There has been a significant relation between gender and type of companies preferred for providing ideas ($X^2 = 23.296$; $p = 0.000 < 0.05$). There has been no significant relation between gender and the preference of the way of receiving the call to provide ideas ($X^2 = 6.786$; $p = 0.148 > 0.05$). There has been no significant relation between gender and willingness to announce their names once their ideas have been approved ($X^2 = 1.705$; $p = 0.127 > 0.05$). There has been a significant relation between gender and preference on the way of announcement of their names ($X^2 = 13.355$; $p = 0.010 < 0.05$).

Hypothesis 2: There is a significant relationship between the views on intellectual activities and age.

Table 6

*The Relationship Between the Views on Intellectual Activities and Age*

| | | 18-20 | | 21-23 | | 24+ | | p |
|---|---|---|---|---|---|---|---|---|
| | | n | % | n | % | n | % | |
| Willingness to participate in intellectual activities | Yes | 221 | 81.5 | 125 | 78.6 | 16 | 80.0 | $X^2 = 0.551$ p = 0.759 |
| | No | 50 | 18.5 | 34 | 21.4 | 4 | 20.0 | |
| Reward expectation in intellectual activities | Yes | 198 | 89.6 | 109 | 87.2 | 15 | 93.8 | $X^2 = 0.857$ p = 0.651 |
| | No | 23 | 10.4 | 16 | 12.8 | 1 | 6.2 | |
| The expected reward type in intellectual activities | Material | 145 | 65.6 | 102 | 81.6 | 13 | 81.2 | $X^2 = 10.821$ p = 0.004 |
| | Immaterial | 76 | 34.4 | 23 | 18.4 | 3 | 18.8 | |

Table 6 to be continued

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| The expected reward content in intellectual activities | Money | 71 | 32.1 | 41 | 32.8 | 5 | 31.2 | |
| | Scholarship | 53 | 24.0 | 25 | 20.0 | 3 | 18.8 | |
| | Book support | 5 | 2.3 | 2 | 1.6 | 0 | 0.0 | |
| | Food support | 8 | 3.6 | 3 | 2.4 | 0 | 0.0 | $X^2 = 16.935$ p = 0.260 |
| | Computer-tablet-mobile phone | 5 | 2.3 | 8 | 6.4 | 0 | 0.0 | |
| | Internship-job opportunity | 63 | 28.5 | 40 | 32.0 | 4 | 25.0 | |
| | Travel-vacation | 14 | 6.3 | 5 | 4.0 | 4 | 25.0 | |
| | Gift vouchers depend on the company's products | 2 | 0.9 | 1 | 0.8 | 0 | 0.0 | |
| Type of companies preferred for providing ideas | Food | 42 | 19.0 | 15 | 12.0 | 1 | 6.2 | |
| | Cloth | 72 | 32.6 | 33 | 26.4 | 7 | 43.8 | |
| | Informatics | 43 | 19.5 | 34 | 27.2 | 5 | 31.2 | $X^2 = 13.542$ p = 0.195 |
| | Media | 41 | 18.6 | 21 | 16.8 | 3 | 18.8 | |
| The preference of the way of receiving the call to provide ideas | Bank | 10 | 4.5 | 10 | 8.0 | 0 | 0.0 | |
| | Automotive | 13 | 5.9 | 12 | 9.6 | 0 | 0.0 | |
| | E-mail | 125 | 56.6 | 74 | 59.2 | 9 | 56.2 | |
| | SMS | 56 | 25.3 | 30 | 24.0 | 2 | 12.5 | |
| | University web site | 14 | 6.3 | 7 | 5.6 | 0 | 0.0 | $X^2 = 20.837$ p = 0.008 |
| | Banner | 5 | 2.3 | 1 | 0.8 | 3 | 18.8 | |
| | Stand at the university | 21 | 9.5 | 13 | 10.4 | 2 | 12.5 | |
| Willingness to announce their names once their ideas have been approved | Yes | 188 | 85.1 | 106 | 84.8 | 14 | 87.5 | $X^2 = 0.082$ p = 0.960 |
| | No | 33 | 14.9 | 19 | 15.2 | 2 | 12.5 | |
| Preference on the way of announcement of their names | Company web site | 86 | 45.7 | 51 | 48.1 | 6 | 42.9 | |
| | University web site | 51 | 27.1 | 15 | 14.2 | 4 | 28.6 | |
| | Television ad | 32 | 17.0 | 22 | 20.8 | 1 | 7.1 | $X^2 = 11.878$ p = 0.157 |
| | Paper ad | 5 | 2.7 | 3 | 2.8 | 0 | 0.0 | |
| | Billboard | 14 | 7.4 | 15 | 14.2 | 3 | 21.4 | |

There has been no significant relation between age and willingness to participate in intellectual activities ($X^2 = 0.551$; $p = 0.759 > 0.05$). There has been no significant relation between age and the expectation of a reward ($X^2 = 0.857$; $p = 0.651 > 0.05$). There has been a significant relation between age and the expected reward content in intellectual activities ($X^2 = 10.821$; $p = 0.004 < 0.05$). There has been no significant relation between age and content of the expected material reward in intellectual activities ($X^2 = 16.935$; $p = 0.260 > 0.05$). There has been no significant relation between age and type of companies preferred for providing ideas ($X^2 = 13.542$; $p = 0.195 > 0.05$). There has been a significant relation between age and the preference of the way of receiving the call to provide ideas ($X^2 = 20.837$; $p = 0.008 < 0.05$). There has been no significant relation between age and willingness to announce their names once their ideas have been approved ($X^2 = 0.082$; $p = 0.960 > 0.05$). There has been no significant relation between age and preference on the way of announcement of their names ($X^2 = 11.878$; $p = 0.157 > 0.05$).

Hypothesis 3: There is a significant relationship between the views on intellectual activities and academic unit.

Table 7

*The Relationship Between the Views on Intellectual Activities and Academic Unit*

| | | Faculty | | Vocational school | | p |
|---|---|---|---|---|---|---|
| | | n | % | n | % | |
| Willingness to participate in intellectual activities | Yes | 158 | 78.2 | 204 | 82.3 | $X^2 = 1.155$ p = 0.170 |
| | No | 44 | 21.8 | 44 | 17.7 | |
| Reward expectation in intellectual activities | Yes | 143 | 90.5 | 179 | 87.7 | $X^2 = 0.691$ p = 0.255 |
| | No | 15 | 9.5 | 25 | 12.3 | |
| The expected reward content in intellectual activities | Material | 124 | 78.5 | 136 | 66.7 | $X^2 = 6.141$ p = 0.009 |
| | Immaterial | 34 | 21.5 | 68 | 33.3 | |
| Type of companies preferred for providing ideas | Money | 50 | 31.6 | 67 | 32.8 | $X^2 = 8.855$ p = 0.263 |
| | Scholarship | 40 | 25.3 | 41 | 20.1 | |
| | Book support | 1 | 0.6 | 6 | 2.9 | |
| | Food support | 5 | 3.2 | 6 | 2.9 | |
| | Computer-tablet-mobile phone | 7 | 4.4 | 6 | 2.9 | |
| | Internship-job opportunity | 42 | 26.6 | 65 | 31.9 | |
| | Travel-vacation | 13 | 8.2 | 10 | 4.9 | |
| | Gift vouchers depend on the company's products | 0 | 0.0 | 3 | 1.5 | |
| | Food | 26 | 16.5 | 32 | 15.7 | |
| | Cloth | 47 | 29.7 | 65 | 31.9 | |
| | Informatics | 41 | 25.9 | 41 | 20.1 | $X^2 = 5.095$ p = 0.404 |
| | Media | 30 | 19.0 | 35 | 17.2 | |
| | Bank | 5 | 3.2 | 15 | 7.4 | |
| The preference of the way of receiving the call to provide ideas | Automotive | 9 | 5.7 | 16 | 7.8 | |
| | E-mail | 93 | 58.9 | 115 | 56.4 | |
| | SMS | 33 | 20.9 | 55 | 27.0 | $X^2 = 2.627$ p = 0.622 |
| | University web site | 11 | 7.0 | 10 | 4.9 | |
| | Banner | 5 | 3.2 | 4 | 2.0 | |
| | Stand at the university | 16 | 10.1 | 20 | 9.8 | |
| Willingness to announce their names once their ideas have been approved | Yes | 129 | 81.6 | 179 | 87.7 | $X^2 = 2.610$ p = 0.072 |
| | No | 29 | 18.4 | 25 | 12.3 | |
| Preference on the way of announcement of their names | Company web site | 65 | 50.4 | 78 | 43.6 | $X^2 =$ 25.765 p = 0.000 |
| | University web site | 15 | 11.6 | 55 | 30.7 | |
| | Television ad | 26 | 20.2 | 29 | 16.2 | |
| | Paper ad | 1 | 0.8 | 7 | 3.9 | |
| | Billboard | 22 | 17.1 | 10 | 5.6 | |

There has been no significant relation between unit and willingness to participate in intellectual activities ($X^2 = 1.155$; $p = 0.170 > 0.05$). There has been no significant relation between unit and the expectation of a reward ($X^2 = 0.691$; $p = 0.255 > 0.05$). There has been a significant relation between unit and the expected reward content in intellectual activities ($X^2 = 6.141$; $p = 0.009 < 0.05$). There has been no significant relation between unit and content of the expected material reward in intellectual activities ($X^2 = 8.855$; $p = 0.263 > 0.05$). There has been no significant relation between unit and type of companies preferred for providing ideas ($X^2 = 5.095$; $p = 0.404 > 0.05$). There has been no significant relation between unit and the preference of the way of receiving the call to provide ideas ($X^2 = 2.627$; $p = 0.622 > 0.05$). There has been no significant relation between unit and willingness to announce their names once their ideas have been approved ($X^2 = 2.610$; p =

0.072 > 0.05). There has been a significant relation between unit and preference on the way of announcement of their names ($X^2 = 25.765$; $p = 0.000 < 0.05$).

Hypothesis 4: There is a significant relationship between the views on intellectual activities and class.

Table 8

*The Relationship Between the Views on Intellectual Activities and Class*

| | | Prep. | | 1st year | | 2nd year | | 3rd year | | 4th year | | p |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | n | % | n | % | n | % | n | % | n | % | |
| Willingness to participate in intellectual activities | Yes | 18 | 81.8 | 165 | 82.5 | 100 | 79.4 | 49 | 74.2 | 30 | 83.3 | $X^2 = 2.462$ |
| | No | 4 | 18.2 | 35 | 17.5 | 26 | 20.6 | 17 | 25.8 | 6 | 16.7 | $p = 0.652$ |
| Reward expectation in intellectual activities | Yes | 17 | 94.4 | 147 | 89.1 | 86 | 86.0 | 46 | 93.9 | 26 | 86.7 | $X^2 = 2.811$ |
| | No | 1 | 5.6 | 18 | 10.9 | 14 | 14.0 | 3 | 6.1 | 4 | 13.3 | $p = 0.590$ |
| The expected reward type in intellectual activities | Material | 14 | 77.8 | 111 | 67.3 | 70 | 70.0 | 40 | 81.6 | 25 | 83.3 | $X^2 = 6.462$ |
| | Immaterial | 4 | 22.2 | 54 | 32.7 | 30 | 30.0 | 9 | 18.4 | 5 | 16.7 | $p = 0.167$ |
| The expected reward content in intellectual activities | Money | 5 | 27.8 | 58 | 35.2 | 25 | 25.0 | 18 | 36.7 | 11 | 36.7 | |
| | Scholarship | 10 | 55.6 | 45 | 27.3 | 16 | 16.0 | 6 | 12.2 | 4 | 13.3 | |
| | Book support | 0 | 0.0 | 5 | 3.0 | 1 | 1.0 | 0 | 0.0 | 1 | 3.3 | |
| | Food support | 1 | 5.6 | 2 | 1.2 | 5 | 5.0 | 2 | 4.1 | 1 | 3.3 | $X^2 = 47.993$ $p = 0.011$ |
| | Computer-tablet-mobile phone | 0 | 0.0 | 4 | 2.4 | 3 | 3.0 | 3 | 6.1 | 3 | 10.0 | |
| | Internship-job opportunity | 2 | 11.1 | 44 | 26.7 | 37 | 37.0 | 16 | 32.7 | 8 | 26.7 | |
| | Travel-vacation | 0 | 0.0 | 7 | 4.2 | 10 | 10.0 | 4 | 8.2 | 2 | 6.7 | |
| | Gift vouchers depend on the company's products | 0 | 0.0 | 0 | 0.0 | 3 | 3.0 | 0 | 0.0 | 0 | 0.0 | |
| Type of companies preferred for providing ideas | Food | 2 | 11.1 | 31 | 18.8 | 13 | 13.0 | 8 | 16.3 | 4 | 13.3 | |
| | Cloth | 7 | 38.9 | 48 | 29.1 | 34 | 34.0 | 12 | 24.5 | 11 | 36.7 | |
| | Informatics | 5 | 27.8 | 33 | 20.0 | 19 | 19.0 | 16 | 32.7 | 9 | 30.0 | $X^2 = 19.366$ $p = 0.498$ |
| | Media | 2 | 11.1 | 32 | 19.4 | 19 | 19.0 | 7 | 14.3 | 5 | 16.7 | |
| The preference of the way of receiving the call to provide ideas | Bank | 2 | 11.1 | 9 | 5.5 | 8 | 8.0 | 0 | 0.0 | 1 | 3.3 | |
| | Automotive | 0 | 0.0 | 12 | 7.3 | 7 | 7.0 | 6 | 12.2 | 0 | 0.0 | |
| | E-mail | 8 | 44.4 | 94 | 57.0 | 60 | 60.0 | 31 | 63.3 | 15 | 50.0 | |
| | SMS | 4 | 22.2 | 47 | 28.5 | 21 | 21.0 | 7 | 14.3 | 9 | 30.0 | $X^2 = 15.084$ $p = 0.518$ |
| | University web site | 3 | 16.7 | 6 | 3.6 | 7 | 7.0 | 3 | 6.1 | 2 | 6.7 | |
| | Banner | 0 | 0.0 | 3 | 1.8 | 2 | 2.0 | 3 | 6.1 | 1 | 3.3 | |
| | Stand at the university | 3 | 16.7 | 15 | 9.1 | 10 | 10.0 | 5 | 10.2 | 3 | 10.0 | |
| Willingness to announce their names once their ideas have been approved | Yes | 17 | 94.4 | 141 | 85.5 | 88 | 88.0 | 38 | 77.6 | 24 | 80.0 | $X^2 = 4.732$ $p = 0.316$ |
| | No | 1 | 5.6 | 24 | 14.5 | 12 | 12.0 | 11 | 22.4 | 6 | 20.0 | |
| Preference on the way of announcement of their names | Company web site | 10 | 58.8 | 60 | 42.6 | 44 | 50.0 | 18 | 47.4 | 11 | 45.8 | |
| | University web site | 5 | 29.4 | 35 | 24.8 | 24 | 27.3 | 2 | 5.3 | 4 | 16.7 | $X^2 = 35.060$ $p = 0.004$ |
| | Television ad | 0 | 0.0 | 30 | 21.3 | 15 | 17.0 | 6 | 15.8 | 4 | 16.7 | |
| | Paper ad | 0 | 0.0 | 6 | 4.3 | 1 | 1.1 | 1 | 2.6 | 0 | 0.0 | |
| | Billboard | 2 | 11.8 | 10 | 7.1 | 4 | 4.5 | 11 | 28.9 | 5 | 20.8 | |

There has been no significant relation between year and willingness to participate in intellectual activities ($X^2 = 2.462$; $p = 0.652 > 0.05$). There has been no significant relation between year and the expectation of a reward ($X^2 = 2.811$; $p = 0.590 > 0.05$). There has been no significant relation between year and the expected reward content in intellectual activities ($X^2 = 6.462$; $p = 0.167 > 0.05$). There has been a significant relation between year and content of the expected material reward in intellectual activities ($X^2 = 47.993$; $p = 0.011 <$

0.05). There has been no significant relation between year and type of companies preferred for providing ideas ($X^2$ = 19.366; p = 0.498 > 0.05). There has been no significant relation between year and the preference of the way of receiving the call to provide ideas ($X^2$ = 15.084; p = 0.518 >.0.05). There has been no significant relation between year and willingness to announce their names once their ideas have been approved ($X^2$ = 4.732; p = 0.316 > 0.05). There has been a significant relation between year and preference on the way of announcement of their names ($X^2$ = 35.060; p = 0.004 < 0.05).

Hypothesis 5: There is a significant relationship between the views on intellectual activities and the type of education.

Table 9

*The Relationship Between the Views on Intellectual Activities and the Type of Education*

| | | Scholar | | Fee-paying | | p |
|---|---|---|---|---|---|---|
| | | n | % | n | % | |
| Willingness to participate in intellectual activities | Yes | 319 | 80.8 | 43 | 78.2 | $X^2$ = 0.204 p = 0.384 |
| | No | 76 | 19.2 | 12 | 21.8 | |
| Reward expectation in intellectual activities | Yes | 282 | 88.4 | 40 | 93.0 | $X^2$ = 0.824 p = 0.269 |
| | No | 37 | 11.6 | 3 | 7.0 | |
| The expected reward type in intellectual activities | Material | 228 | 71.5 | 32 | 74.4 | $X^2$ = 0.162 p = 0.420 |
| | Immaterial | 91 | 28.5 | 11 | 25.6 | |
| The expected reward content in intellectual activities | Money | 103 | 32.3 | 14 | 32.6 | $X^2$ = 7.877 p = 0.344 |
| | Scholarship | 66 | 20.7 | 15 | 34.9 | |
| | Book support | 7 | 2.2 | 0 | 0.0 | |
| | Food support | 10 | 3.1 | 1 | 2.3 | |
| | Computer-tablet-mobile phone | 12 | 3.8 | 1 | 2.3 | |
| | Internship-job opportunity | 97 | 30.4 | 10 | 23.3 | |
| | Travel-vacation | 22 | 6.9 | 1 | 2.3 | |
| | Gift vouchers depend on the company's products | 2 | 0.6 | 1 | 2.3 | |
| Type of companies preferred for providing ideas | Food | 49 | 15.4 | 9 | 20.9 | $X^2$ = 9.294 p = 0.098 |
| | Cloth | 99 | 31.0 | 13 | 30.2 | |
| | Informatics | 74 | 23.2 | 8 | 18.6 | |
| | Media | 60 | 18.8 | 5 | 11.6 | |
| | Bank | 19 | 6.0 | 1 | 2.3 | |
| | Automotive | 18 | 5.6 | 7 | 16.3 | |
| The preference of the way of receiving the call to provide ideas | E-mail | 185 | 58.0 | 23 | 53.5 | $X^2$ = 5.119 p = 0.275 |
| | SMS | 74 | 23.2 | 14 | 32.6 | |
| | University web site | 17 | 5.3 | 4 | 9.3 | |
| | Banner | 9 | 2.8 | 0 | 0.0 | |
| | Stand at the university | 34 | 10.7 | 2 | 4.7 | |
| Willingness to announce their once their ideas have been approved | Yes | 269 | 84.3 | 39 | 90.7 | $X^2$ = 1.212 p = 0.194 |
| | No | 50 | 15.7 | 4 | 9.3 | |
| Preference on the way of announcement of their names | Company web site | 126 | 46.8 | 17 | 43.6 | $X^2$ = 6.282 p = 0.179 |
| | University web site | 64 | 23.8 | 6 | 15.4 | |
| | Television ad | 46 | 17.1 | 9 | 23.1 | |
| | Paper ad | 5 | 1.9 | 3 | 7.7 | |
| | Billboard | 28 | 10.4 | 4 | 10.3 | |

There has been no significant relation between type of education and willingness to participate in intellectual activities ($X^2 = 0.204$; $p = 0.384 > 0.05$). There has been no significant relation between type of education and the expectation of a reward ($X^2 = 0.162$; $p = 0.420 > 0.05$). There has been no significant relation between year and the expected reward content in intellectual activities ($X^2 = 6.462$; $p = 0.167 > 0.05$). There has been no significant relation between type of education and content of the expected material reward in intellectual activities ($X^2 = 7.877$; $p = 0.344 > 0.05$). There has been no significant relation between type of education and type of companies preferred for providing ideas ($X^2 = 9.294$; $p = 0.098 > 0.05$). There has been no significant relation between type of education and the preference of the way of receiving the call to provide ideas ($X^2 = 5.119$; $p = 0.275 > 0.05$). There has been no significant relation between type of education and willingness to announce their names once their ideas have been approved ($X^2 = 1.212$; $p = 0.194 > 0.05$). There has been no significant relation between type of education and preference on the way of announcement of their names ($X^2 = 6.282$; $p = 0.179 > 0.05$).

## Conclusion

The tests which have been held through to the hypotheses have been carried out under consideration of five variables: gender, age, unit (vocational school, faculty), class, and education type. Considering the test results with the variable gender, it has been revealed that there is a significant relationship between the views on intellectual activities and gender. In other words, either female students are more outgoing than male students or they are more willing to prove themselves. However, the expectation of reward has no connection with gender differences because actually, all of the students are in expectation of a reward without gender difference and their reward expectations are materialistic. However, the content of the award varies according to gender. Female students have preferred more of the opportunity for internship and job, while male students have tended towards money. It may be considered that female students are seeking to ensure to find a job after graduating because it is more difficult for them to find a job compared to male students. Considering the type of company, female students have preferred mostly clothing companies, while male students have preferred informatics companies. So, it would not be wrong to say that the gender difference in their choices in normal life has been reflected to their choices here, as well. While men more likely tend to informatics, women generally tend to clothes and fashion. Considering the way of taking calls, both genders have preferred to receive the call via e-mail or text message. It can be said that this result is directly proportional with the young population's use of technology today. Since mobile phones or internet are the most used communication tools, it is normal to have such a result.

Once their ideas are approved, both genders have been willing to have their names announced. Considering the way of announcing their names, both genders have also preferred the Internet and they have wanted their name to be announced on the company's website. Since Internet is the most common communication, this has affected the choice here. Considering the results based on the second variable, the age factor, it is clear that this factor is not affective on joining intellectual activities. So, a large majority of these three ranges of age have replied this as "yes". Like gender, in age factor, regardless of the range, there is expectation of reward and in a way; this can be interpreted as the need to be satisfied. It can be said that that's why there is award in the skeletal structure of the method of crowdsourcing. People need to be paid off their hard work and efforts in a way. The age factor seems to be more important within the context of reward.

While younger students have tended to mostly non-material rewards of, as the age has increased, the rate has decreased. The content of the material reward has been classified under three headings regardless of age:

money, scholarship, and internship-job opportunity. This can be explained with the desire of the university students to secure their future after graduating because they concern for their future. They have financial concerns about their future in this period of their lives. No difference by age has appeared according to the type of company. The effect of the age factor in the preference of receiving the call has been observed. Although receiving a call via e-mail is the first preference of all three age groups, as the range of age has grown, the second preference has shifted through banners. The Internet can be the reason of preference of the students whose ages are 18-20. The students whose age is over 24 may have preferred the printed visual communication tools. All three age groups have been willing to have their names announced. It can be interpreted as the will to receive the reward in return their efforts. Considering the announcement of the name, age has not been an important factor. All of the three age groups have given the priority to company's website. Considering the third variable, the unit (vocational school/faculty), it is seen that there is no difference in the will to participate in intellectual activities. Students of both units have shown a high percentage of will to participate. The unit has made no difference in expectation of reward; students have emphasized their expectations of the reward. Considering the content of the reward, students of vocational school have preferred mostly non-material rewards while students of faculties have preferred mostly material rewards. The unit has not been an influential factor in the choice of content of the material reward. Both faculty and vocational school students have respectively made choice of the same three: money, internship-job opportunity, and scholarship. Here, too, as in the age variable, it is possible to say that most of university students are in need of financial support. In the same way, no unit difference has been observed in the choice of the type of company. The same sort has been seen in both groups: clothing, informatics, and media. So, this shows that students have been affected by the same things and have made their preferences in the same direction. Since students' interests have not differed according to the unit, their preferences have resulted in the same direction.

Considering the preference of the way of receiving the call to provide ideas, it has been observed that the unit has not been a distinctive element. Most of the students have chosen to take the call via text message or e-mail. Given the technology they use to communicate today, it has not been surprising that their preferences have been in this way. Students of both units have been eager about the announcement of their names. However, a difference has been observed between units about the way of the announcement of their names. While students of both units have determined company's website as their first choice, they have been differed in the second preferences. Second choice of faculty students has been television commercial, while the second choice of vocational school students has been the school's web site. In this sense it can be said that faculty students are more eager about the announcement of their names. When the results have been assessed according to the fourth variable which is the class, no difference in the will to participate intellectual activities has been observed again. Likewise, the expectation of reward has not differed in this variable; the vast majority of students have reward expectancy. The preference for content of the award also has been on material rewards for all classes. However, there has been a difference in preference of the content of material reward between the classes. While the first choice of preparation class students has been scholarship, the choices of 1st year students have been on money, then scholarship. For 2nd year students the internship has been their priority; for 3rd and 4th year students, money has been their priority. While the students at the beginning stage of school have preferred scholarships and internships to be able to learn their professions better and to have a better education, the needs of the 3rd year and 4th year students who prepare to embark on life have been more of material. In addition, if we consider 2nd year as the graduating class for vocational school students, the result

through first choice as internship is not surprising, because internship is essential for vocational school students in order to get a job. There is no difference between the classes regarding the type of company to provide ideas because students generally tend to same things. Trends focus on clothing and informatics companies. Trends of university students have been reflected to their preferences in general.

The choice of receiving the call to provide an idea has also been the same for all years. The first choice of all classes has been e-mailing, then SMS. The communication preferences of students in their daily lives have also been reflected in here. In other words, it can be said that preferences have been formed through the Internet or mobile communication. Year has not been a distinctive element about the announcement of their names; all students of all years wish their names to be announced which reflects their desire for the introduction of their efforts, appreciation, and approval. However, there is a difference regarding the way of the announcement of their names. While the first choice of the preparation year, 1st year and 2nd year students have been the company's web site and the second choice of them is school's web site; the second choice of 3rd and 4th year students has been billboard. So, while preparation year, 1st, and 2nd year students keep their desire for recognition more limited, 3rd and 4th year students have been more anxious about the recognition. When the results related the last variable, which is the type of learning (scholarship/fee) examined, it has been observed that the type of education does not have a distinctive impact on willingness to participate in intellectual activities. Likewise, it does not have a distinctive impact on the expectation of reward; the vast majority of students have been in expectation of reward and the type of the reward has been determined as material. Considering the needs of a student, this seems perfectly normal. The content of the expected material reward has centred upon the same preferences: money, internship-job opportunity, and scholarship. As mentioned in the previous variables, material needs are the needs students need the most during their education life; therefore, it is natural for the choice to be this way. Type of companies preferred for providing ideas does not differ according to this variable either. Clothing and informatics companies have been the priorities in preference of companies. The type of education has not been a distinctive element in the preference of the way of receiving the call to provide ideas. As with other variables, the choice of receiving a call has been in the form of e-mail and SMS. Willingness on names to be announced once their ideas have been approved has not changed for this variable either; the vast majority of students are eager to announce their names. There has been no difference in the way of the announcement of the name in terms of the type of education. Company's web site has been the first choice of the students.

As a result, elements that give the same results have emerged according to the variables such as gender, age, unit, class, and type of education. Willingness to participate in intellectual activities has been high for all variables and that has proven that university student community is to be a good crowd for crowdsourcing. University students have shown that they would volunteer for such an activity. When companies make such a demand, participation can be expected to be high. As for this study, it is also obvious that a true crowd has been chosen to be measured. However, when the university students have been chosen a target crowd, it should be noted that the other element is the expectation of reward that does not differ according to variables. "The reward" which is one of the important elements of crowdsourcing is important for this crowd as well. The award will be presented to students who must be specified clearly. Thus, the participation may be even higher. Another factor which is common to all the variables is the way of receiving the call. As noted earlier, the ways the students prefer to communicate nowadays have a major impact on the way students have preferred to receive the calls. Since their communications are through the Internet or mobile communication. It should be

another important evidence for choosing the university students as the target crowd, because crowdsourcing is a method that is executed over the internet and university students' community is a very convenient crowd to this method.

The last element not differed according to variables has been their willingness for their names to be announced. Students have been in favour of announcing their names once their ideas have been approved, no matter what they want to be liked, appreciated, and recognised.

## References


Bon, L. G. (2002). *The crowd: A study of the popular mind*. Scotts Valley: CreateSpace Independent Publishing Platform.

Brabham, D. C. (2008a). Crowdsourcing as a model for problem solving. *Convergence: The International Journal of Research into New Media Technologies, 14*(1), 75-90. Retrieved from https://doi.org/10.1177/1354856507084420

Brabham, D. C. (2008b). Moving the crowd at iStockphoto: The composition of the crowd and motivations for participation in a crowdsourcing application. *First Monday, 13*(6), 1-22. Retrieved from https://doi.org/10.5210/fm.v13i6.2159

Brabham, D. C. (2013). *Crowdsourcing (The MIT Press essential knowledge series)*. Cambridge: The MIT Press.

Chesbrough, H. (2004). Managing open innovation. *Research-Technology Management, 47*(1), 23-26. Retrieved from https://doi.org/10.1080/08956308.2004.11671604

Chesbrough, H. (2006). *Open business models: How to thrive in the new innovation landscape* (1st ed.). Boston: Harvard Business Review Press.

Chesbrough, H., Vanhaverbeke, W., & West, J. (2008). *Open innovation: Researching a new paradigm* (Illustrated ed.). Oxford: Oxford University Press.

Drucker, P. F. (1998). The discipline of innovation. *Leader to Leader, 1998*(9), 13-15. Retrieved from https://doi.org/10.1002/ltl.40619980906

Estellés-Arolas, E., & González-Ladrón-de-Guevara, F. (2012). Towards an integrated crowdsourcing definition. *Journal of Information Science, 38*(2), 189-200. Retrieved from https://doi.org/10.1177/0165551512437638

Estellés-Arolas, E., Navarro-Giner, R., & González-Ladrón-de-Guevara, F. (2015). Crowdsourcing fundamentals: Definition and typology. In *Advances in crowdsourcing* (pp. 33-48). Retrieved from https://doi.org/10.1007/978-3-319-18341-1_3

Faludi, J. (2014). Fifty shades of Innovation. From open toward user and open collaborative innovation. An overview. *Budapest Management Review, 45*, 33-43. Retrieved from https://core.ac.uk/download/pdf/33182573.pdf

Felin, T., & Zenger, T. R. (2014). Closed or open innovation? Problem solving and the governance choice. *Research Policy, 43*(5), 914-925. Retrieved from https://doi.org/10.1016/j.respol.2013.09.006

Garrigos-Simon, F. J., Gil-Pechuán, I., & Estelles-Miguel, S. (Eds.). (2015). From crowdsourcing to the use of masscapital. The common perspective of the success of Apple, Facebook, Google, Lego, TripAdvisor, and Zara. In *Advances in crowdsourcing* (pp. 1-14). Retrieved from https://doi.org/10.1007/978-3-319-18341-1

Grier, D. A. (2013). *Crowdsourcing for dummies* (1st ed.). Hoboken: For Dummies.

Gupta, P. (2011). Leading innovation change—The Kotter way. *International Journal of Innovation Science, 3*(3), 141-150. Retrieved from https://doi.org/10.1260/1757-2223.3.3.141

Hamel, G. (2014). *Simdi Ne Yapiyoruz*. New York: Optimist.

Howe, J. (2006). The rise of crowdsourcing. *Wired, 14*(6), 1-4. Retrieved from https://www.wired.com/2006/06/crowds/

Howe, J. (2009). *Crowdsourcing: Why the power of the crowd is driving the future of business* (0 ed.). New York: Currency.

Jayanti, E. (2012). Open sourced organizational learning: Implications and challenges of crowdsourcing for Human Resource Development (HRD) practitioners. *Human Resource Development International, 15*(3), 375-384. Retrieved from https://doi.org/10.1080/13678868.2012.669235

Khilji, S. E., Mroczkowski, T., & Bernstein, B. (2006). From invention to innovation: Toward developing an integrated innovation model for biotech firms. *Journal of Product Innovation Management, 23*(6), 528-540. Retrieved from https://doi.org/10.1111/j.1540-5885.2006.00222.x

Lebraty, J., & Lobre-Lebraty, K. (2013). *Crowdsourcing: One step beyond* (1st ed.). London: Wiley-ISTE.

Linton, J. D., & Walsh, S. T. (2004). Integrating innovation and learning curve theory: An enabler for moving nanotechnologies and other emerging process technologies into production. *R and D Management, 34*(5), 517-526. Retrieved from https://doi.org/10.1111/j.1467-9310.2004.00359.x

Narayanan, V. K. (2001). *Managing technology and innovation for competitive advantage* (1st ed.). Hoboken: Pearson.

OECD and Statistical Office of the European Communities. (2005). *Oslo manual*. Retrieved from https://www.oecd-ilibrary.org/science-and-technology/oslo-manual_9789264013100-en

Oinas-Kukkonen, H. (2010). Social networks and information systems: Ongoing and future research streams. *Journal of the Association for Information Systems, 11*(Special Issue), 61-68. Retrieved from https://citeseerx.ist.psu.edu/viewdoc/download?doi = 10.1.1.212.3327&rep = rep1&type = pdf

Oinas-Kukkonen, H. (2008). Network analysis and crowds of people as sources of new organisational knowledge, In A. Koohang et al (Ed.), *Knowledge management: Theoretical foundation* (ss. 173-189). Santa Rosa, CA: Informing Science Press.

Oliveira, F., Ramos, I., & Santos, L. (2010). Definition of a crowdsourcing innovation service for the European SMEs. In *Current trends in web engineering* (pp. 412-416). Retrieved from https://doi.org/10.1007/978-3-642-16985-4_37

Prahalad, C. K., & Mashelkar, R. A. (2010). Innovation's Holy Grail. *Harvard Business Review*. Retrieved from https://hbr.org/2010/07/innovations-holy-grail

Sanz-Blas, S., Tena-Monferrer, S., & Sánchez-García, J. (2015). Crowdsourcing: An application of promotional marketing. In *Advances in crowdsourcing* (pp. 147-161). Retrieved from https://doi.org/10.1007/978-3-319-18341-1_12

Saxton, G. D., Oh, O., & Kishore, R. (2013). Rules of crowdsourcing: Models, issues, and systems of control. *Information Systems Management, 30*(1), 2-20. Retrieved from https://doi.org/10.1080/10580530.2013.739883

Sloane, P. (2011). The brave new world of open innovation. *Strategic Direction, 27*(5), 3-4. Retrieved from https://doi.org/10.1108/02580541111125725

Smith, K. (1998). *Science, technology and innovation indicators, a guide for policy makers*. Retrieved from https://nifu.brage.unit.no/nifu-xmlui/bitstream/handle/11250/226472/Idea5.pdf?sequence = 1

Surowiecki, J., Gardner, G., & Audio, R. H. (2005). *The wisdom of crowds: Why the many are smarter than the few and how collective wisdom shapes business, economies, societies and nations*. London: Abacus, Little Brown Book Group

Thawrani, V., Londhe, N. D., & Singh, R. (2014). Crowdsourcing of medical data. *IETE Technical Review, 31*(3), 249-253. Retrieved from https://doi.org/10.1080/02564602.2014.906971

Tidd, J., & Bessant, J. R. (2005). *Managing innovation: Integrating technological, market and organizational change*. Hoboken: Wiley and Sons Publications.

Vukovic, M. (2009). Crowdsourcing for enterprises. In *2009 congress on services—I* (pp. 686-692). Retrieved from https://doi.org/10.1109/services-i.2009.56

Walter, F. (2014). Attracting top contributors to an open innovation project. *Harvard Business Review*. Retrieved from https://hbr.org/2014/05/attracting-top-contributors-to-an-open-innovation-project

Whitla, P. (2009). Crowdsourcing and its application in marketing activities. *Contemporary Management Research, 5*(1), 15-28. Retrieved from https://doi.org/10.7903/cmr.1145

Zhang, L., & Zhang, H. J. (2011). Research of crowdsourcing model based on case study. In *ICSSSM11* (pp. 1-5). Retrieved from https://doi.org/10.1109/icsssm.2011.5959456