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THE APPLICATION OF CROWD SOURCING IN EDUCATIONAL ACTIVITIES

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Abstract

Purpose—*This paper analyses the role of crowdsourcing use in educational activities. In recent decades, the rapid growth of innovative Internet-based information and communication technologies created a new field of opportunities for educational organizations to reach their goals. Crowdsourcing, as defined by Jeff Howe (2006), is the act of taking a job traditionally performed by a designated employee and outsourcing it to an undefined, generally large group of people in the form of an open call. The newness of the term indicates that there is not significant literature on the subject of how this operating method is utilized in educational activities. The objective of this paper therefore is to take an exploratory look at how educational organizations are using crowdsourcing as part of their activities at the present time, and to suggest how the practice of crowdsourcing may spread to other educational activities as time goes on.*

Design/methodology/approach—*The paper presents a conceptual model of crowdsourcing application in educational activities. The model is supported by analysis and synthesis of scientific literature and case studies.*

Findings—*Analysis of literature and case studies allowed the creation of a conceptual model which shows the use of crowdsourcing in educational and supporting tasks of organizations. This tool will be helpful for future research on the subject, since it provides a framework of the analysis.*

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Research limitations/implications—*The model presented here is a conceptual model and needs to be validated empirically.*

Practical implications—*For practical purposes, the variables proposed in the model would provide a more comprehensive framework for the assessment of crowdsourcing use in education activities and work as a guide for crowdsourcing strategies.*

Originality/Value—*Although the relevant literature consists of many partial and indirect insights and indications in the direction as conceived by the model, the full model as such is original. The authors' primary contribution is in perceiving the holistic picture of the research subject.*

Keywords*: crowdsourcing, social innovation, social technologies, educational activities.*

Research type*: conceptual paper.*

1. Introduction

In recent decades, the rapid growth of innovative Internet based information and communication technologies created a new field of opportunities for organizations to reach their goals. One of the alternatives is—crowdsourcing. Crowdsourcing, as defined by Jeff Howe (2006), is the act of taking a job traditionally performed by a designated employee and outsourcing it to an undefined, generally large group of people in the form of an open call. Educational organizations have many tasks that are essential, but that require time and energy that could be used to focus on instruction, crowdsourcing can be the answer.

The article analyses possible role of crowdsourcing use in educational activities. The newness of the term "crowdsourcing" indicates that there isn't any significant literature on the subject of how this operating method is utilized not only in educational activities, but also in other types of enterprises. The objective of this paper therefore is to take an exploratory look at how educational organizations are using crowdsourcing as part of their activities at the present time, and to suggest how the practice of crowdsourcing may spread to other educational activities as time goes on.

2. Theoretical Background: Roots and Principles of Crowdsourcing

Crowdsourcing is a relatively recent concept that involves many different practices and approaches. This diversity leads to the blurring of the limits of what is crowdsourcing and what this word means. Also, there is a close relation between co-creation, user innovation and user generated activities. Estelles-Arolas and Gonzalez-Ladron-de-Guevara (2012) tackled this problem in their article "Towards Integrated Crowdsourcing definition". By analyzing existing definitions of crowdsourcing they have extracted

common elements and characteristics of any crowdsourcing initiative and based on this presented consistent definition of crowdsourcing. After reviewing 209 documents (journal papers, books, working papers, etc.) the authors found 40 original definitions. From the textual analysis of these definitions and the revision of the literature eight main characteristics were identified: the crowd, the task at hand, the recompense obtained, the crowdsourcer or initiator of the crowdsourcing activity, what is obtained by them following the crowdsourcing process, the type of process, the call to participate, and the medium. Proposed definition was tested on 11 case studies and was adjusted to fit them all. Unfortunately, its length and complexity makes it unusable. Because of that I will use in this paper the definition proposed by the creator of crowdsourcing Howe (2006):

"Crowdsourcing represents the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call."

Before moving on, the roots of crowdsourcing must be discussed. Although the term "crowdsourcing" didn't enter modern vocabulary until article in *Wired* magazine by Jeff Howe (2006), the general idea has been around forever. For example, think about sayings such as "Two heads are better than one," "None of us is as dumb as all of us" or the concept of democracy when everyone can decide the future of a state or company.

To some degree, Howe was inspired by James Surowiecki's 2004 best-seller *The Wisdom of Crowds*. Surowiecki's title was a long-awaited response to an 1841 book by Charles Mackay called *Extraordinary Popular Delusions and the Madness of Crowds*. Mackay's book posited the theme that people acting individually can be pretty smart, but collectively they turn into a mindless herd, a theory largely unchallenged for over 150 years until Surowiecki's book. Surowiecki (2004) made extensive research on collective judgment and crowd intuition. Based on empirical investigations—such as estimating the weight of an ox, to the Columbia shuttle disaster, to gaming sports betting spreads—the author finds that "under the right circumstances, groups are remarkably intelligent, and are often smarter than the smartest people in them" and this "wisdom of crowds" is derived not from averaging solutions, but from aggregating them. In other words, "the many are smarter than the few," because as the famous philosopher Levy (1997) said "No one knows everything, everyone knows something, all knowledge resides in humanity." According to the Surowiecki—you are more likely (but not guaranteed) to get a better estimate or decision from a group of diverse, independent, motivated people than you are from a single or even a couple of experts.

Also, important in explaining crowdsourcing is the Diversity Trumps Ability Theorem proved by professor at University of Michigan, Scott E. Page, who proved his Diversity Trumps Ability in 2007 and his book titled *The Difference: How the Power of Diversity Creates Better Groups, Firms, Schools and Societies.* The author uses mathematical modelling and case studies to show how variety in staffing produces organizational strength and more efficient solutions. The research revealed—diverse groups of people bring to organizations more and different ways of seeing a problem and, thus, faster/better ways of solving it. The essence of this theorem is "a randomly selected collection of problem solvers outperforms a collection of the best individual problem

solvers." The Diversity Theorem represents the core of crowdsourcing—the notion a crowd of people acting in concert can make a better decision than any individual could ever have managed. By drawing in as many contributors as possible, crowdsourcing brings the necessary diversity into the co-creation process.

Internet technologies made it easier for individuals to share knowledge to reach certain goals—from creating online encyclopaedia to designing a logo for a corporation or solving scientific problems. The web provides the perfect technology capable of aggregating millions of disparate, independent ideas in the way markets and intelligent voting systems do, without the dangers of "too much communication" and compromise (Surowiecki, 2004).

Crowdsourcing can be used in various ways. The main idea of it—sharing of knowledge, expertise, time and resources—sounds humanitarian, something that can be helpful for society in reaching positive goals. There are number of tools which help to use crowdsourcing online. The foundation of social media is peer share and approval. The excitement of the "social media share" is to demonstrate knowledge or expertise and a preference for the product or service with others within the social network. And this is what can drive crowdsourcing—people wanting to show their expertise solving issues together.

3. Crowdsourcing in Educational Activities: Proposed Conceptual Model

The paper presents a conceptual model of crowdsourcing application in educational activities and needs to be validated empirically. The model is supported by the analysis and synthesis of the scientific literature and case studies.

A traditional educational organization, for example Universities, is populated by students, teachers, researchers, administrators and staff, and possesses a certain legal status by maintaining a relationship with accreditation bodies and government. Just like any other organizations, educational organizations have their fair share of problems. These problems come in all shapes and sizes and can sometimes seem unrelenting. The usual method of attack for solving these problems involves sending out surveys, forming committees, setting up forums, and hiring consultants. A new way for solving issues could be—crowdsourcing.

Since virtual relationships are now possible and have become commonplace outside of educational settings, management of the educational organizations should take into consideration workforce found in the crowd. First of all, networks of all sorts (Facebook, Ning, Twitter), webcams, Skype, etc. have changed the very definition of presence. Second, technology has changed who is part of the team. Many of the functions related to infrastructure can be subcontracted or otherwise outsourced. For example, instead of giving lectures in person, an instructor may deliver lectures via podcast

There are so many ways to use crowdsourcing within organization, so the author of the research divided ways to apply it into to two groups: educational tasks and supporting tasks. The medium of the Web enables to harness collective intellect among a population in ways face-to-face communication cannot, due to limitations of time, place, etc. This chapter argues that the crowdsourcing model, a successful, Web-based, distributed problem solving and production model for business, is an appropriate model for enabling educational organizations in their processes. Crowdsourcing has emerged as a vital aspect of education on the web, because it promotes the openness and sharing of resources and knowledge contributed by communities.

3.1. Crowdsourcing Educational Tasks

Educational activities have significantly evolved over the past decade due to the emergence of Web 2.0 and 3.0 internet technologies that facilitate new learning forms in adaptive online environments. New communication tools have begun to change how society understands and approach teaching and learning, giving us new opportunities to connect with, manipulate, and share learning content and providing a means for a more social learning experience. Evolved internet technologies enable learners and educators to co-create learning.

Crowdsourcing in the development and use of educational materials allows web-tools to leverage collaboration and produce materials using help of user groups and other stakeholders. Such community-based design can help capture, refine, carry out, systematize or evaluate aspects of online learning materials. This chapter is designed to explore existing practices that educational organizations use while employing crowdsourcing.

First use of crowdsourcing can be noticed in *data collection and analytics*. Most notable works are collaboration between scientific organizations and students of Universities or just general public. NASA's Clickworkers is a project which involves space enthusiasts to categorize crater patterns on Mars. One can mention a number of Universities that crowdsource part of their research, for example: Screensaver Project (Oxford University with the National Foundation for Cancer Research), SETI (Search for Extraterrestrial Intelligence), Quake-Catcher Network Turn your laptop into a seismic sensor (QCNLive). Most important aspect of crowdsourcing is that which involves students and young researchers in solving big and important problems. San Francisco State University associate professor of biology Gretchen LeBuh created the Great Sunflower Project with leftover grant money in 2008.

The University of Alabama is allowing the public to participate in two projects for their library. They allow users to "tag" or "transcribe" materials from existing collections, meaning that from the comfort of their own computer users can tag people, places and accidents in the material. This helps to create *crowdsourced content*. Crowdsourced content is also used in creating *programmes for classes* and *textbook design*. Writing and publishing a complete book is and has been a difficult process for one or few persons to cope with. With the help of crowd sourcing, non-professional enthusiasts have the

opportunity to participate with others in the creation of new types of books. Hundreds of people with an interest in literacy and lesson design could choose areas of interest and create amazingly interesting, deep, connected, and focused lessons.

A good example of a crowdsourced textbook is the project led by Professor E. Gehringer from North Carolina State University (US). The project involved 120 students who worked together to create a textbook for computer science and computer engineering class. Participants experienced peer reviewed writing and the use of wikis in the process. As is pointed out by Gehringer (2011), in the project the group used open software Expertisa and were guided by deadlines and expectations for review and revision, wiki workspace and coordinated writing of sequential chapters, different types and stages of feedback including anonymous peer reviews, and instructor and teaching assistant editing. As it was pointed out by the creator of this project, the most important factor why educational organizations need wiki textbooks is feel of ownership students get after participating in such projects. They get more involved and learn more because of that. A global project was led by Professor Charles Wankel from St. John's University. This project of creating a textbook *Project Management for Instructional Designers* involved hundreds of co-creators from 90 countries. Similar projects keep popping up around the globe.

There are a lot of advantages to crowdsourcing a book—up-to-date texts, case studies and results, minimized cost, interactive learning and involvement of the students—but one must keep in mind that crowdsourced projects require time and effort in coordinating the collaborative writing and review process to ensure that the end product is beneficial to learners and maintained moving forward. Nevertheless, crowdsourcing is emerging as a way in which professors, teachers and other content experts are not only creating textbook content, but also managing the collaborative writing process of multiple contributors and customizing products for use in their courses. New tools and knowledge available online will allow to apply crowdsourcing in even more educational activities.

3.2. Supporting Tasks

As was pointed out in the previous section, crowdsourcing can play a powerful role within educational organization. Use of crowdsourcing can keep organizations forefront of education innovation, prepare students for the online world challenges, and most importantly to stimulate closer communication between students, faculty and administration and beyond the campus with other institutions and groups. But crowdsourcing can only be helpful in solving on-campus problems that educational organizations face. Crowdsourcing can help find solutions for on-campus issues and provide fresh feedback or even ideas on how to solve problems differently.

Firstly, it is important to mention that crowdsourcing strategies in non-educational organizations are used to reach their goals. Because of the newness of the concept there is no taxonomy created for uses of crowdsourcing, but most commonly mentioned strategies in scientific literature are: *crowd wisdom, crowd creation, crowd funding,*

crowd democracy and crowd reviews. Crowdsourcing can be used for problem solving as well innovation because of that it can play a key role in getting the whole organizational body co-working together on the issues central to the institute. This section will provide examples of how these strategies can be used for supporting tasks of educational organizations.

California State University Fullerton (US) looked to its community to suggest strategic initiatives for the institution's future simply through the medium of email. Community was asked to suggest possible strategic initiatives for the development of University and propose initiatives that will result in specific projects that match our strengths with our opportunities. This is a perfect example for use of *crowd wisdom* and *crowd democracy* for issues resolution. Head of educational organizations not always have the relevant insight that students often have into their campus and educational needs. Another example of crowd wisdom use could be Indiana University initiative to change costly tech-support help desk by allowing computer users to answer each other's questions instead.

Carleton University (US) is using crowdsourcing tools, including text messages, voicemail, and the Internet to capture the local history of the Pontiac region through its community. Project called HeritageCrowd is creating database for online historical exhibits, using information from the inhabitants who actually reside in the region. Positive outcome and mass participation proved that people find it amusing contributing to academic work as a community. Such projects are clear example of *crowd creation* used in educational organization when without help of the community the University would have to hire people to conduct surveys on topic to get information for historical exhibitions.

Crowd funding is an especially topical subject for educational organization since they often have limited funds for their projects or even students. Globally, underprivileged, but well-performing students often do not have a chance to go to college since it costs a lot. For this reason, a platform named Takeashine helps students get donations through crowdfunding. Crowdfunding allows more potential graduates to get higher education diploma, since the public is comfortable with donating small amounts of money for a good cause.

Crowdsourcing became a famous concept mainly because huge corporations started to outsource their *marketing* campaigns while asking the crowd to create commercials, logos or even names of the products or services. The Unigo platform was created to fulfil the marketing need of educational organizations. With the help of this tool graduate students can create reviews and profiles on their schools or universities. These profiles are much more useful and exciting for future students or their parents when they are making a decision where to study.

This section showed variety of ways universities are using crowdsourcing as a tool. One of the primary advantages of crowdsourcing is the ability to reach and engage a broader intelligence pool with broader set of mind organizations can develop something new and very exciting for the whole community. One must keep in mind, that crowdsourcing should become part of organization's culture and not some last minute

"life west" when other tools do not work. Community and especially students want to feel their input is valuable, respected and changes are made according to the input of the crowd.

4. Discussion and Conclusions

People want to participate and to collaborate on important projects. The positive outcomes of universities, colleges and high schools using crowdsourcing show that the best person to do a job is the one who most wants to do that job. How many retired professors, teachers, educators, and other professionals would still like to contribute? How many people love education, have valuable skills and expertise, but work in fields outside of education? These and many similar questions are what drive crowdsourcing for education. After a study of possible ways to use it in educational activities one must follow up with a discussion of why organizations should crowdsource their activities.

Most important of all the benefits is that crowdsourcing offers a bunch of benefits to the students that participate. For example, crowdsourcing give students real world experience in coming up with creative solutions to important problems. Students can apply classroom knowledge to real world problems and learn the ins and outs of their chosen fields from a practical perspective. Also this alludes to the quality of the solutions needed. The students know the community and therefore have a better shot at creating solutions that truly fit the community's needs. Students involvement also leads to positive PR. Educational organizations can gain positive reputation while involving not only the students but community in decision making process. It is important to note that more and more of society at large, and consequently many students, are demanding an educational system that works for and with them. So, a student-centred learning environment should be the priority of educational organization.

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MINIOS IŠTEKLIŲ NAUDOJIMAS ŠVIETIME

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Santrauka.

Tikslas *– spartus interneto technologijų vystymasis per paskutinius kelis dešimtmečius organizacijoms suteikė daug naujų galimybių pasiekti savo tikslus. Ypatingai daug galimybių atvėre socialinių tinklų atsiradimas ir išplitimas visuomenėje. Viena iš alternatyvų organizacijoms yra minios išteklių naudojimas. Pagal Jeff Howe (2006), minios ištekliai (angl. crowdsourcing) yra veiksmas, kai užduotį, kurią anksčiau atlikdavo organizacijos darbuoto-*

jai, atviru šaukimu pateikiamas grupei anoniminių sprendėjų. Šios koncepcijos esmė yra didelis informacijos ir žinių kiekis, kurio aprėpti negali vienas žmogus ar kelių žmonių grupė, todėl krepiamasi pagalbos į minią.

Švietimo įstaigos turi daug svarbių funkcijų (pvz.: patalpų priežiūra, rinkotyra ir t. t.), reikalaujančių daug laiko ir energijos, kuri galėtų būti panaudota švietimui ir mokymui. Taip pat mokslo įstaigos ne visada turi pakankamai lėšų ar idėjų, kaip atlikti funkcijas. Minios išteklių naudojimas šiuo atveju gali padėti.

Termino naujumas indikuoja, kad nėra pakankamai mokslinės literatūros šaltinių, kaip minios ištekliai gali būti panaudojami švietimo įstaigų veikloje. Todėl šio straipsnio tikslas yra pateikti apžvalgą veiklų, kaip švietimo organizacijos naudoja minios išteklius atlikdamos savo funkcijas ir jas susisteminti į koncepcinį modelį, kuris padėtų atskleisti šios priemonės panaudojimo potencialą švietime.

Metodologija – *straipsnis pristato koncepcinį modelį, kuris nurodo, kaip minios* ***resursai*** *yra naudojami švietimo įstaigų veikloje. Šis modelis yra paremtas mokslinės literatūros ir atvejų analizių nagrinėjimu ir sinteze.*

Rezultatai *– literatūros ir atvejų analizė leido sukurti koncepcinį modelį, kuris išskiria pagrindines ir šalutines švietimo įstaigų veiklas bei funkcijas, kuriose naudojamasi minios resursais. Šio įrankio naujumas neleidžia susidaryti išsamaus naudojimo galimybių vaizdo, tačiau pirminis modelis suteikia pagrindą tolesniam temos nagrinėjimui.*

Tyrimo ribotumas *– pateiktas modelis yra koncepcinis ir turi būti empiriškai išbandytas.*

Praktinė reikšmė *– pristatytas modelis gali būti naudojamas kaip įrankis tolesnei empirinei analizei ir veikti kaip vadovas švietimo institucijoms panaudojant minios išteklius veikloje. Pateiktų pavyzdžių gausa padėtų organizacijoms rasti kelius į problemų sprendimą naudojant šią priemonę.*

Orginalumas/vertingumas *– nors straipsnyje gausu dalinių ir netikslių įžvalgų bei išvadų, šis modelis yra pirmasis indėlis mokslinėje literatūroje į temos nagrinėjimą bei pateikia holistinį nagrinėjamos temo vaizdą.*

Tyrimo tipas: *koncepcijų pristatymas.*

Raktažodžiai: *minios ištekliai, socialinė inovacija, švietimo įstaigos.*