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Original Research

Ranking the Notification Methods Based on Behaviors of Information Seeking for Academic Audience in Advertising Usage

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Abstract

Notification in academic environments is really important for managing the academic relationship. Notification in these environments is difference from other environments due to the differences in goals, audiences, tools, and concept of notification. However, in these environments with different academic fields to certain ways of notification are given the importance and they get their specific related information to their field just via special forms. In better words peoples' information-seeking behavior in academic environments furthermore significance differences with general ones, are different in peoples' specialty and academic group. Therefore, one effective notification strategy for scientific groups must be consistent with the patterns of information-seeking behavior of audiences. In this article at first information in different ways and channels are introduced. Then, we describe the academic atmosphere as a notification environment to the views of needs, necessities, and goals of academic notification. The more, the channels of information in terms of the impact on different groups deemed to be investigated. In the end, with identifying the features of one effective notification for academic environment, we suggest a strategy for academic environments.

Keywords: Information Seeking Behaviors, Effective Notification, Media Ranking, academic Audience.

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1. Introduction

Every activity including academic ones needs information [1]. This need for the sake of variety of reasons makes each one to go through information paths. So, he needs a pattern for getting information [2]. A pattern for getting information is a person's behavior to reach his specific result in one path or informational vessel including one or multi steps such as search, verify, concentration, categories, valuing, and extraction [3, 4].

When the amount of information has been enormously increased, a pattern of getting information must provide a path to lead to useful information packages. Buckland has categorized the information into four groups: information as cognition, information as process, information as data mining, and information as an object [5]. Based on the classification of information seeking on the content of academic and academic communication management are included in the category "Information as a process".

Information seeking basically is an individual skill, which today due to the enhancement of information propagation, the variety of possible forms of notification packages and the huge amount of issues in these channels, has been gotten a significant importance. ISB must provide a procedure for achieving the people's informational needs furthermore it must be able to solve the problems like, Inaccurate or false, worthless and irrelevant information. These problems in general and specific fields lead to some risks, dangers, and damages [6]. In addition these tools and notification paths which have made the ways of identifying the optimal strategies for informing difficult for special audiences, also in conceptual dimension every academic message which is being sent to the receiver via a channel, might be due to the background, make different meaning, conception, and understanding [7]. Thus we must have a particular attention to peoples' notification patterns in academic environments. For this reason, individuals' information-seeking in the academic environments is one of the special issues in strategies of EN [8].

The type of information needed in a scientific activity, different from any other public activities and to disseminate information channels effectively to meet the information need to be active in the academic environment [9]. When we want to imply a notification plan to academic environments, we should pay attention to the following features:

1. Notification's goals
2. Audiences
3. Notification's tools
4. The content [10].

These items require the need of extraction of different notification pattern compared to general environments.

When a notification model is supposed to be selected, we must examine the effect of notification system in point of view of achieving the considered goals and meet the needs of the audience. According to Quail media impact is divided to two categories, powerful, and limited. In powerful mode there is passivity against media system from the audience and in limited mode his activity [6]. The type of information that is to be published should be required in respect of each of these two types of effects to choose a different approach. Because using the steady notification way without paying attention to the kind of behavior that information seeker have, causes a reduction in its effectiveness. In this paper by examining the behavioral differences in information seeking within different academic groups, we try to compare ways and tools of notification for categorized audiences in academic environments [4].

Following the paper is: In the second part we describe the academic environment due to the notification. Then we discuss the classifying the channels according to the objects of this research. To evaluate different methods of informing the practical implementation of a notification plan outlines. At last by statistic analyzing the result of the implementation of a notification plan, we compare different notification methods in aspect of the impact on audiences.

2. Information Seeking Behavior of Academic Audience

Academic environments are centered on different forms of academic activities, which are generally categorized into three groups [3, 7]:

o Didactic:
   In this form of academic activities, knowledge packages are supplied to the audiences via educational channels and tools which are divided into temporary, durational, and continuous.

o Research:
   In this form of academic activity knowledge people (tutors, students, researchers, expert) attempt to solve an issue through a defined atmosphere by academic tools and based on academic resources or just merely examine a description of an atmosphere or an issue.

o Productively/ Consulting:
   Educational and research activities in one level can turn to more practical and offered to the public and industrial sectors that are non-scientific nature with a focus on the objectivity of the results and their products.

An academic activity that may one or a group of people be busy for a while on it, has three phases. These phases are: a. Definition b. Performance c. Propagation of achieved academic products. Achieving the desirable result needs managing, establishing interaction between the components and different roles, necessary notification [10]. Therefore there must be made a specific notification channel between the three components of an academic work (figure 1).
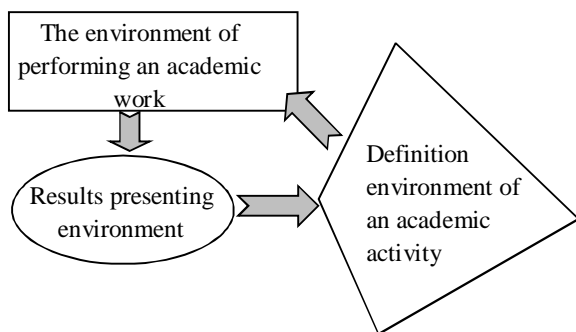

Figure 1. An academic activity environment circle

These channels must provide the exist goals for notification in academic environments, and with high level of effectiveness be leaded to reinforce academic products, commercialization of knowledge, and extend the application of knowledge.

Informing and notification of all academic spaces from related happened academic actions, developments and advances which occurred in a section of that, are really important. Scientific news to those who need it and this news has a direct impact on their academic work, is very important [11]. Inviting students, teachers and researchers to attend a special event or making an academic communication for participating in great research plans and even notification for identifying the experts in an academic issue and totally all the subjects related to academic connection management such as, introducing the scientific achievements, research paths management, designation of research goals, and etc. are the items which show the importance of notification for specific audiences in academic environments. Later we will explain more this importance. Then we describe the main goals in academic notification.

2.1. Notification Necessities in Academic Environments

Academic environments like universities, research institutes, and different research teams continuously experience difference academic changes and developments. Beside this accelerated procedure an academic management (totally or sectional) is needed to provide an effective and total strategy for total information propagating related to one sections' developments or all of the academic area. This issue goes to necessity when we know that making a base for notification in academic environment compared to more general environments is more important. The most important reasons are:

1. *The high rate of innovation in academic environment*

In these areas constantly the new scientific products are produced or the current scientific products are used newly. In these areas due to the fact that the bases of ideation and subject creation are ready, the issue, the way, and the product have the highest dynamism.

2. *Continuous effectiveness network*

Now days the result of pure science and basic are turned to practical and being able to be experienced by practical and technical experts, sometimes visual results help to get better understanding of pure concepts. Therefore the results of an academic section naturally impact

other sections' activity or get affection from the others.

3. *Technological and academic packages' variety*

Technological packages are in forms such as, knowledge product, practical model or strategy, technical advices, educational courses and so on. These packages can be presented as the academic capital in business edition and be useful for industry, service, and general sections, or can enhance the quality of current editions. This topic provides the necessity of notification for current products' audiences.

4. *The variety of academic events*

Scientific exhibitions, workshops, seminars and conferences which are represents of academic achievements with different goals try to provide propagation and exchange ideas about academic products. They should inform their audiences and by their helpings achieve their goals.

5. *The necessity of academically growth and providing a continuous academic flow*

Due to excessive specialization of scientific topics, basically academic growth has been more related to creation of a constant academic. Academic environments are leaded simply a waste of time and energy due to the scattered, without purpose, without effective and non-operating results researches. In these researches because of non-existence of clear goal or lack of identifying the used environment or propagation of academic achievement, some problems happen like attrition of study, motivation reduction, unreal academic achievements, and things like that. In here notification like a joint in academic skeleton can help to facilitate the actions, enhance the delicacy, proper setting the goals in academic activities.

Therefore identifying effective informing methods for notification the target audiences of a new subject, new occurrence, or an important event in academic environments, which the rate of innovation and paths developments and its products are much bigger than any other environments and is including potential staff, has an inevitable necessity for managing these collections.

2.2. Notification's Goals in Academic Environments

Notification's goals in today's academic environments have been changed. After the formation of scientific environment and create mechanisms for defining and implementing the activities of such subjects: The need to engage internal environment, accordantly demands of the external environment, facilitate the implementation of activities, and the effectiveness of these activities beside the enhancement of the academic products' quality. Total analysis of the circumstances leading to the redefinition of notification, which is merely, is propagation internal of academic developments and transformation to the external environments. Following we explain the two main goals of academic notification.

1. *Academic relationship management (internal environmental)*

Academic trends management and making academic relationship between different scientific sections are the crucial issues. Therefore definitely the most important goal of notification in academic environments is providing a structure for managing the academic relationship and easing the academic trends which prevent parallel working, academic trends erosion, academic achievements' quality reduction, academic motivational reduction, lack of planning for balanced scientific activities, lack of transformation of the initial achievements to mechanisms for knowledge commercialization, and etc.

2. *Introducing the capacities and academic experiences (external environmental)*

Introducing the academic capacities in order to identifying the successful experiences can boost the definition of the effective academic paths. One of the main achievements of scientific environments is having professionals on very detailed topics, accurate and diverse technical disciplines of science. These people are knowledge capital capacities, which are suppliers of society's demanding in practical and industrial plans, so they should be identified and totally and accurately. Therefore by notification and propagation of the things that we have and the academic environmental' abilities, have other environments relationships which need these abilities.

2.3. Notification's Audiences in Academic Environments

In academic activities people such as tutors, students, researchers, and experts (education/research) the centrality they are.

They are the ones who define educational/research work, manage them, perform them, and probably they try to make the achievements to practical subjects and they suggest to similar research areas and private companies [7].

Using the same methods in transforming one event in academic environments confront to some weaknesses and problems. Some parts of the problems are related to the differences in the various scientific sections. The people who are active in different fields and with different specialties, do not get their daily information related to them and their profession in a same way [9]. Also each group in an special way gives the importance to the information and take them in a serious subject. Then it is necessary for the ones who are related to managing the events, propagation of the information, and informing the audiences that follow a special way of notification for each group of them. If we wish to inform an important event, which has specific audience in academic environment, we should identify their behavioral differences in information seeking and their ways of getting the information. Otherwise, the low efficiency of information we will face and poor results of your target audience will receive [11,12].

For distinguishing the differences of academic groups firstly we categorized them in ten groups in table 1 after interviewing experts. Usually most of these categories are present in all academic centers, although it is possible that some academic centers don't have one or more sections.

In addition to scientific expertise that have been categorized within the ten sectors, the kind of the way of academic work and their products have been mentioned. For example, the working way of a person in mathematic science field is abstraction framework and the products are conceptual.

Table 1. Scientific collections, their methods and derivatives

No.	Science field	Working way	Kind of product
1	Mathematics science	Abstract	Presenting the conceptual way
2	Environments science	Experience	Presenting the product
3	Engineering science	Abstract-Experience	Presenting the product
4	Accountings science	Abstract-Postural	Presenting the way
5	Management science	Abstract-Experience-Postural	Presenting the way
6	Cognitive Science	Abstract-Experience	Presenting the way and product
7	Human science	Abstract-Experience	Presenting the way
8	Artistic science	Abstract	Presenting the product
9	Medical science	Experience	Presenting the way and product
10	Basic science	Abstract-Experience	Presenting the way and product

However, one in medical field work completely empirically, and the type of his activities' outputs is presenting objective methods and real products. Or for instance it is possible for a person in human science that the audio information be more attractive and writing tools be more effective for art field. In general, however, this would certainly include exceptions. Thus, depending on the nature of the scientific field of science itself, can be placed in one of these categories, which their information seeking behavior in getting knowledge about their profession naturally will be different from the others.

3. Categorizing the Notification's Kinds

University environments are isolated atmospheres which the behavioral rules in it are much different compared to other social environments. But in such environments are still significant differences between the treatment different groups in dissimilar areas of expertise. One of the important behaviors in these environments is the way of information seeking according to different people. A person's information seeking can be depended on multiple factors such as, cultural factors, ethnical factors, and etc. However, a specialized field effect can't be neglected in their information-seeking behavior. A person in biology compared to a person in engineering field certainly has differences due to the amount of attention to notification tools. We will review the different methods that currently exist in notification and categorize them according to their focused feature.

3.1. Notification's Different Methods

Notification tolls can be examined through the seven groups according to table 2. Then meanwhile introducing each group, we present a brief description of each one. The seven categories of information tools with multiple capabilities primarily focus on one aspect of the special privileges and the obvious (table 2).

1. Direct

It is a direct way of communication which uses the behavioral skills (linguistic, referential, implemental, movement), for transforming specific knowledge.

2. General

By focusing on one way separation, is used for transforming the information. General channels including voice, picture, and general environments are the elements of this kind of notification.

3. Written

In these media by focusing on messaging in forms like a report or an article in a magazine, the text of the announcement, a message in a written advertisement, and a headline on a poster, try to propagate a subject and notification around it.

4. Pictorial-Demonstrational

This type of media using a visual dimension to the concept of an event, an issue in the field of awareness and transmission provides such as images, three-dimensional models, photo clip, short video clips.

5. Constructional

As a reference, based on the type of media to communicate with members of the audience, constructional provides the ongoing needs of their members about the awareness of related issues. Groups, NGO's, and people's networks are known as a constructional media.

Table 2 notification tools' different groups

Media type	Channel	Focus
Direct	Lecturing, interview, oral presentation	Behavioral
General	Radio, TV, environmental advertisement	Span
Written	Magazine, Announcements and Classifieds, poster, …	Messaging
Pictorial-Demonstrational	Picture, 3D plan, clipart, Voice message	Conceptualization
Constructional	NGO, Official groups, Authorized centers, invitation letters	Recruitment
Virtual	Email, Personal Page, Social Networks, Smart Solutions	Dealing
Mobiles	Text messages, Mobile Social Networks	Availability

6. Virtual

Virtual mechanism that focuses on creating a double bed and a variety of interactive knowledge transfer deals. This platform provides a large variety of tools and smart.

7. Mobiles

Mobiles are the most available notification devises which provide a close relationship with people.

4. Evaluation of the Effectiveness of Different Notification Ways

To assess the effect of each type of media which are presented in table 2, we objectively have evaluated them in a given project. The design was conducted information to invite people to participate in a scientific poll, which the features of this plan are:

a) The audiences were students
b) The duration of implementing the plan was 14 days
c) The location of implementing the plan was University of Tarbiat Modares
d) The different notification channels, with enough time to propagation of information related to the defined poll, have been performed.
e) Participating to the plan was optional.

The following are the details of the implementation are discussed.

4.1 Notification Plan's Steps

For notification and invitation of around 700 students for participating in this academic poll, the following steps have been done:
1- Call to register at the site of the first and second call
2- Sending an invitation to all university emails
3- Send e-mail to 758 by the administrator when necessary and to respond and fix the problem
4- Sending text messages to 4500 mobile phone number for 5 times

5- Send an invitation by the scientific community
6- Environmental notification, including the installation of banners and placards and posters in most public spaces
7- Handing over daily broadcast announcements in public places frequented by people
8- Verbal invitation to students and tutors

With direct reference to the class, the students were asked to participate in this program. This work was performed in accordance with the following table:

Table 3 Direct reference

Date	Direct reference
7 April	Engineering-Sciences
8 April	Human science-Arts-Medical science

The following sections describe the various models of information is done and the cost of its implementation is also provided.

Table 4 performed notification model's sections

Cash (Rails)	Implement	Channel	Notification tools
300.000 R	Introduced in the classroom Schools	face to face	Direct
300.000 R	Call banner installation, ads on bulletin boards Schools	Outdoor advertising	General
900.000 R	Print posters and notices of paper in two cut	Announcements, posters	Written
100.000 R	Installing an image of call	Picture	Pictorial-Demonstrational
400.000 R	Send invitations to members twice	Scientific societies	Constructional

200.000 R	Tow times by computer and Informatics center to number of 6000	E-mail, Site notification	Virtual
500.000 R	Five times in the history of 27/1, 2/2, 4/2, 7/2, 8/2 each time the SMS number 4500	Message	Mobiles

It is clear that the possibility of evaluation of media's effect via general channels such as radio, TV, extensive coverage notification, in this article is not objectively issued. Because general media which focus on spreads, for specific environments like scientific centers has little degree of importance and impact. For example, a document or report in a prestigious journal Science due to having a constructional relationship with its limited audiences has much more effect than the same news in a public media with general audiences.

In implementing of the plan sufficient contents have been provided to people based on sufficient description and clear and accurate news be able to be more and better familiar with the plan and participate in it. Table 5 shows in details the schedule of implementing notification methods during fortnight.

4-2 Collection and Analysis of Statistical Data

People's call informing Plans to participate in a scientific poll was conducted during two weeks, and the statistics of the amount of seeing the plan's contents, registration for participation, and partnership in it has been recorded in table 6. The web site has been seen by 27000 viewers during two weeks. In addition, a total of 1,025 people have applied for membership in the plan which in the end 753 persons did manage to participate in scientific survey.

Table 5 schedule of implementing the notification different methods

Day	Website	Email	Email	Mobile Messages	Association	Environment	Notification	Interface
1	■	■		■				
2								
3								
4								
3			522		■		■	
4								
5	■	■	38	■				
6			12			■		
7				■			■	
8			52		■			
9								
10			70	■			■	■
11			64	■				■
12								
13								

Table 6 observation, membership, and partnership statistics

Date	Visit	Membership	Participate
1	175	73	23
2	600	132	25
3	1050	158	29
4	1500	190	41
3	1856	198	46
4	3989	242	117
5	8900	369	198
6	11860	428	253
7	16400	587	346
8	18100	661	435
9	21139	766	569
10	26615	1002	569
11	26700	1002	611
12	26720	1017	665
13	27000	1025	753

This plan has been performed in an academic environment and its results have been examined by using statistical methods like statistical mean and variance analyze. For evaluating the effect of each notification method on categorized academic groups in table 1, we simultaneously analyzed notification's plans' procedure and people's participation's changes. According to the statistics of audiences the percentage of contribution academic groups are presented in table 7.

Table 7 the statistics of contribution percentage of different groups

No	Aspect of Sci.	Number of people	number of	Percent Of	Percent participat
1	Mathematics science	261	21	03/8 %	08/0 %
2	Environments science Agriculture, Natural resources	1211	166	17/5 %	13/7 %
3	Engineering science, Chemical, Electrical & Computer, Civil & Environmental	1951	297	28/2 %	15/2 %
4	Accountings science	-	-	-	-
5	Management science	643	55	9/2 %	08/7 %
6	Cognitive Science	-	-	-	-
7	Human science	1296	85	18/8 %	06/6 %
8	Artistic science	449	26	6/5 %	05/8 %
9	Medical science	758	57	11/0 %	07/5 %
10	Basic science	341	103	05/0 %	30/2
	Sum	6901	753	100 %	10/9 %

In this plan totally 10.9 percent from statistical society have been participated. The contribution of the people's participation from each faculty, are provided in pie Figure 2.
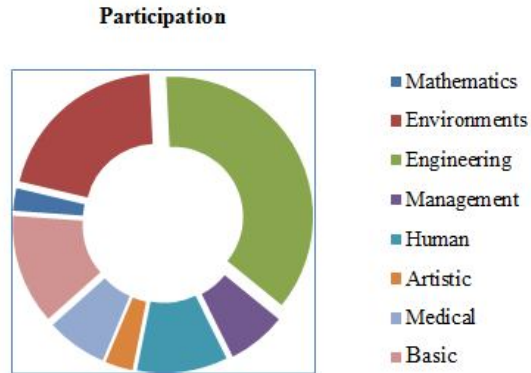

Figure 2. The percentage of the participation of each group

Participation of distribution in equal complexes based on the same location of the components is compared in Figure 3. In figure 4 different complexes participation are compared together.
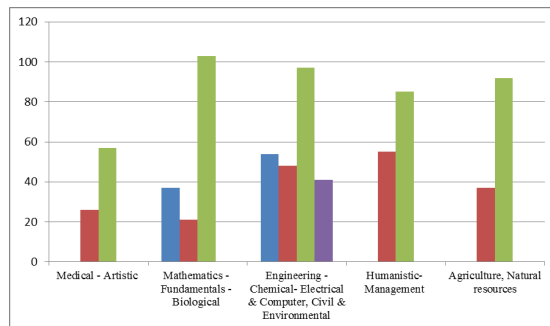

Figure 3. Place Classification and number of participants in the same place
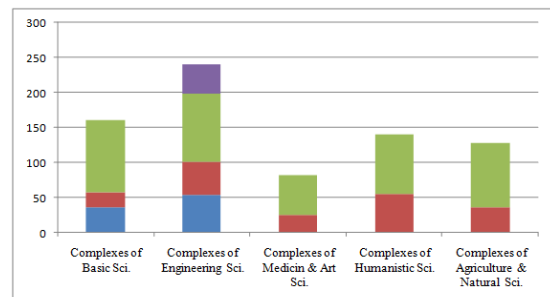

Figure 4. Comparison of participation in various complex

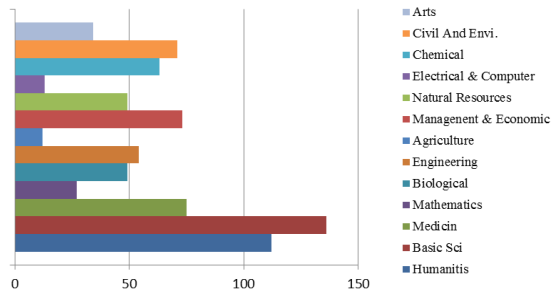Also the faculties are ranked based on the amount of participation in figure 5.

Figure 5. Ranking of schools according to the contribution

Here, according to the proportion of the population that has been set, participation of 13 schools have been compared and ranked. We have ranked the existence groups according to their participation percentage to the whole society. Since the model is used to disseminate information for all channels, they can be ranked in terms of desired information-seeking patterns. This comparison according t the amount of the participation indicates that students and teachers of basic sciences, environmental sciences and engineering sciences, pay attention more than other categories to their informational needs.
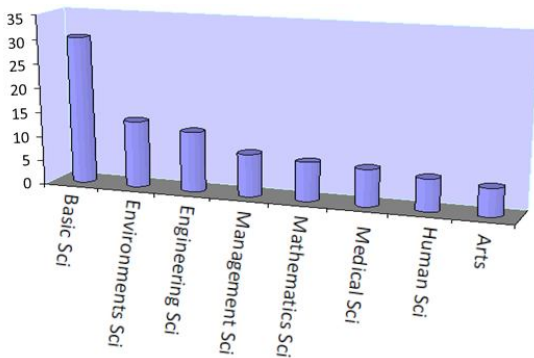

Figure 6. Ranking of science-based information seeking patterns of people

Thus we used the participation rate over the period to rate the effectiveness of information. As Figure 6 shows, participation from the day 6 to 11, were regularly ascending. With statistical variance analyze approach based on the amount of participation changes in designed plan, we can confirm the growth of participation was 53

percentage. So, the major contributions have been made at this time. Therefore, performed notification plan could not achieve the growth more than 21 percent during last three days. The growth rate of participation in the course of appeal confirms the notification model.
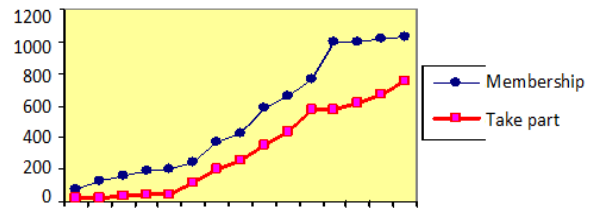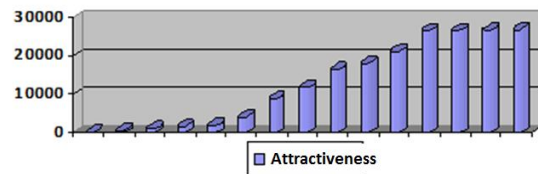

Figure 7. participation

Figure 8. The audience's attention

Compare the utility of different approaches to information and its impact in terms of information-seeking pattern leads us to this result that virtual notification ways have the largest effect on people in academic environments. In other words, information-seeking patterns in scientific environments with interactive methods are more consistent. The ranks of the influence of media on the information seeking behavior of individuals in environments are presented in Table 8.

Table 8. Ranking of media types

Rank	Type of Media	Channel
1	*Virtual*	Website
		Email
		Director Email
2	*Constructional*	Association
3	*Direct*	*face to face*
4	*Written*	Notification
5	*General*	Environment
6	*Mobiles*	Mobile Messages
7	*Pictorial-Demonstrational*	Poster

What could confirm the significance of one notification model in academic environments is optimal use of the tools that you can easily and on

a voluntary basis of information published on the information-seeking. In other words, there is a consistency between the individual and the propagation channel. Table 8 is ranking the channels of exam is based on the extent to which a set of people have access to the information. We have used the degree of A to H instead pf numbers 1 to 8.

Table 9. Ranking channel information
for each set of sciences

	Basic science	Medical science	Art science	Human science	Cognitive Science	Management	Engineering science	Environments	Mathematics
Website	A	A	A	A	A	A	A	A	A
Email	B	B	B	B	B	B	B	B	B
Association	E	C	F	E	E	C	G	G	E
Mobile Messages	H	E	D	H	C	G	E	D	G
Environment	C	H	C	C	D	H	C	H	C
Notification	D	D	E	F	H	E	D	C	D
face to face	G	G	H	G	G	F	H	E	H
Poster	F	F	G	D	F	D	F	F	F

5. Conclusions and Future Research

In this paper we showed that the subject of notification in academic environments has a high level of importance. Then we defined these environments in terms of implementing the notification ways and differentiation in the scientific aspects of information-communication was discussed. To identify the effectiveness of this approach by informing the index on which they have been classified. Likewise, the research teams in 10 categories based on the behavior of its members, we classified. In this study, we tried to by implementing a real plan in an academic environment, to evaluate the amount of effectiveness of notification different channels on defined groups. The main objective is to identify the notification tools, that they are more consistent with each set of information-seeking patterns in each specific group. The results show

that most of groups prefer the virtual channels to the other tools. After that they are interested in getting informational needs via constructed notifications. This subject leads us to this result that definition total notification plans which use all the channels for propagation of peoples' informational needs in academic environments, can have huge successes.

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