Assessing the *Bashaar* Website as a Communication Tool among Scientists, Teachers, and Students

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Abstract

Bashaar is an Israeli academic website that allows teachers and students to pose questions and receive responses from leading university professors in their field of expertise. Our assessment objectives were to explore and analyze the usage of the *Bashaar* website and to investigate teachers' and students' attitudes towards the usage of the website. The research population included 63 science teachers and students who posted questions and responded to a feedback questionnaire. Research tools included open- and close-ended parts of the questionnaire, and interviews of the director, an expert, and the initiator of the Bashaar website. Analysis of the interviews established that the main reasons behind constructing this website were to encourage students to elect a scientific or engineering career, narrow the gap between students, especially from the periphery, and professors, and provide teachers and students with a framework for inquiring about complex topics. Most of the teachers and students were highly satisfied from the professors' responses to their questions and indicated the website role in providing expert thoughts on complex questions. The assessment of the participants' responses showed that overall the website strengthened the communication among scientists, teachers, and students, and contributed to deepening the scientific knowledge of both teachers and students.

Key Words: academic-community relationship, web-based learning, scientific literacy

Introduction

The rapid development in the scientific and technology era poses new challenges for teachers in general and for science teachers in particular. The overall goal of the current approach of science teaching is to foster independent learning, where the teacher no longer serves as a knowledge supplier, but rather an advisor in constructive and complex learning environments. Such learning environments require that teachers be able to receive interesting and inquisitive questions, to which they may answer. In many cases, these questions are interdisciplinary, requiring integration of knowledge and deep understanding of several academic domains. In other cases, this type of questions may arise during designing lesson plans or while professors teach their own students. The *Bashaar* website, founded in 2003, is one of the academic websites in Israel, which aims to strengthen the relationship between the academia, teachers, and students. This website was developed by the academic community to contribute to the development of a scientific society in Israel in general and for the benefit of teachers and students in particular. *Bashaar* website gives teachers and students the opportunity to address subject-specific questions directly to leading faculty members in their respective fields of expertise**.**

Theoretical Background

Over the last decade, the Internet has expanded into nearly every social, educational, and commercial domain. Employed in a variety of contexts, from research, communication, and military applications to casual browsing, the Internet systems continue to evolve (O'Neill, Lavoie &Bennett, 2003). One of website success measure is satisfaction, because a satisfied user will use the website again (Schaupp, Fan & Belanger, 2006).

In the last decade, integrating technology into science teaching has become one of the main factors in educational reforms (Dori & Sasson, 2008). The effectiveness and popularity of the Internet have encouraged integration of web-based learning activities into the curricula of schools and universities (Tsai & Tsai, 2003).

In order to implement effective learning processes for students and educate them to become scientifically literate, a student must understand the relationship between everyday life and culture and the scientific culture as presented in his/her school. To

cross this cultural border, students should have personal experiences with a community of scientists and examine the similarities and differences between their own identity and the identity of a scientist (France and Bay 2010).

Fostering students' question posing capabilities or asking for solutions to real-world problems is a strategy for improving students' problem-solving abilities. As students' question posing skills improve, the number and complexity of questions asked increases. Teachers who learn how to analyze their students' questions can use this process for assessing students' understanding of a subject and their higher order thinking skills (Dori & Herscovits, 1999; 2005).With the rapid progress of the information society, many systems have been developed that supports web-based learning and creates environments, which allow learners to study anywhere and anytime. Web-based learning system, which allows question posing, may improve the learners' cognition, serve as a motivational factor for learning, and improve users' understanding of the subject.

Research objectives

The research objectives were to explore, analyze, and assess the usage of the *Bashaar* website and to investigate teachers' and students' attitudes towards the usage of this website.

Research settings

The *Bashaar* website contains two main components: a pool of questions and a pool of articles. The question pool includes more than 2,600 questions and answers, sorted by 17 disciplines. Every answer to a question, which has been published on the website, is also sent to the mailbox of the asker. The publication of the answers on the website gives an opportunity to every interested person to benefit from reading them.

Unlike most similar websites, *Bashaar* website covers most of the disciplines of science and engineering and a few of humanities, and it does not focus on specific area. Other sites, for instance, Newton[1] website serves only science fields; The

[1] http://www.newton.dep.anl.gov/

NASA[2] website serves fields related to astronomy, and The Science Answer[3] website only serves science-related topics.

Participants

The research population included 63 participants: the initiator of the *Bashaar* website, its director, a scientist and 60 website users – 43 teachers and 17 students.

Tools and methodology

Research tools included: interviews with the website leaders and users' feedback questionnaire.

In the interview with the initiator of the Bashaar website we asked three categories of questions: rationale of the Bashaar website, operation of the website, and feedback on the website activity. The interview with the director of the Bashaar website consisted of questions in three categories: contribution of the website, management of the website, and publishing the website. The faculty member, who has been responding to questions posted on the website, we also posed questions in three categories: academia-community relations, challenges in composing answers, and getting some feedback.

The feedback questionnaire contained ten questions sorted into five categories: (a) motivation, (b) satisfaction from the question posting process, (c) scientific literacy contribution, (d) website usages, and (e) suggestions for website improvements.

Findings

The analysis of the interview with the initiator of the *Bashaa*r website showed that three factors led for the establishment of the website. The first one was to encourage the students to study scientific and engineering professions. The second factor was to break down the barriers between students from 'the periphery' and professors and researchers, and provide better accessibility for the community at large to people from the academia. The third factor was to provide teachers and students with a framework to ask complex questions and receive expert responses.

The process of receiving questions from the website users, as described in the interview of the director of *Bashaar* website, is comprised of three main steps:

[2] http://science.nasa.gov/ask-a-scientist/

[3] http://answers.ask.com/Science

When the user posts the question on the website, the director reads it and makes a decision whether to send the question to an appropriate expert or to answer the question by adding a link. The latter occurs when the question is very simple or general. After receiving the answer, the director publishes the answer on the website, along with the name of the responding expert. The director also sends the answer via e-mail to the question asker.

The director emphasized that users sometimes send feedback in which they express gratitude for the support they had received, which led to expanding and deepening their knowledge. However, currently, there is neither an assessment process of the answer level nor feedback to the expert who answers the question.

The analysis of the interview with the faculty member who answered questions to the *Bashaar* website pointed out two difficulties the experts might encountered while they compose the answers: (1) adjusting the answer level to the users' capabilities and age; (2) making a decision about the extent to which they should expand the answer. There is also a need to get feedback from the user on the answer given by the experts in order to improve the answers if required.

The results of the feedback questionnaire are presented below and sorted specific categories. A. Motivation – This category in the questionnaire consisted of the two questions. The first question was related to the publicity of the *Bashaar* website, while the second question focused on motivating factors of using the website:

How did you get to know about the *Bashaar* website? From a friend, a newspaper, the Internet, other (circle your choice). What is the motivating factor that led you to contact the *Bashaar* website? Please explain.

The distribution of the answers to the first question is presented in Figure 1. The finding shows that most of the teachers have come to know about the *Bashaar* website from the Internet and from other sources, including conferences and training courses. Most of the students (61%) learned about the website from their teachers.

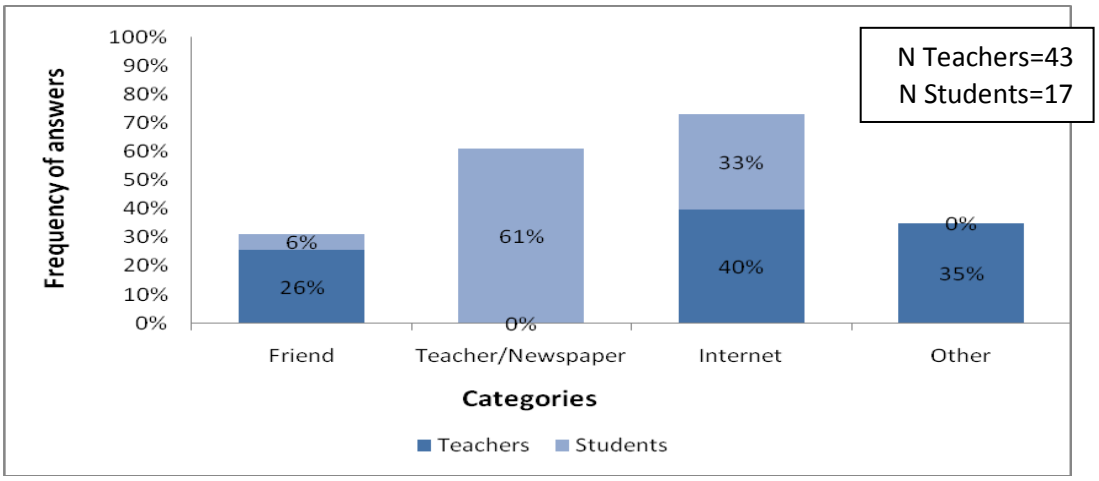

Figure 1: The frequency of the answers regarding the publication of *Bashaar* website

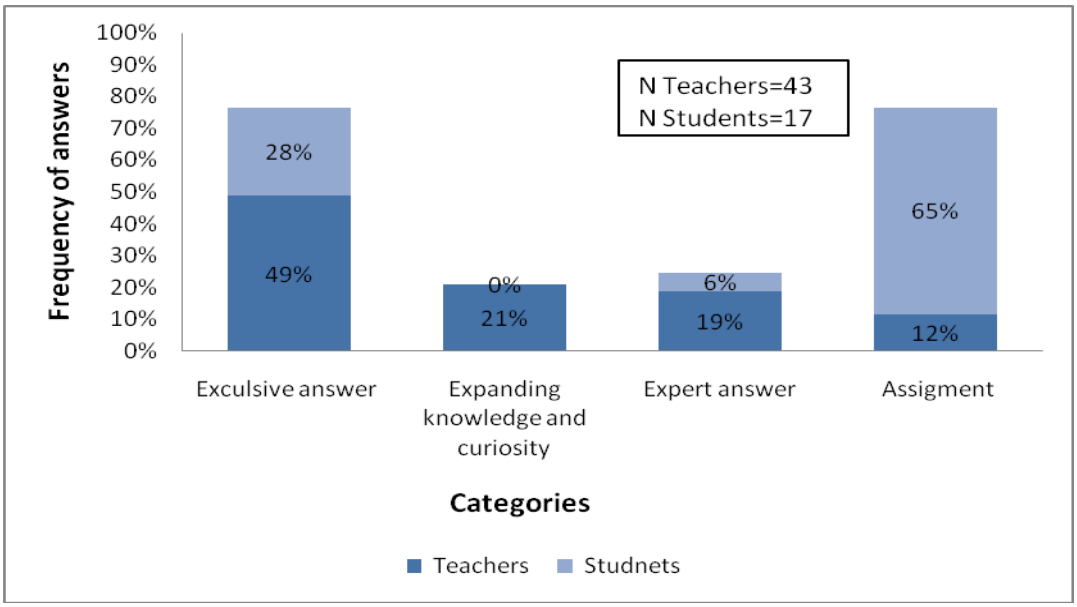

Figure 2: Distribution of answers regarding the motivation for using *Bashaar* website

Analysis of the motivation for posing questions revealed four main factors: exclusive answer, expanding knowledge and curiosity, expert answer, and assignment. The distribution of these motivation factors is presented in Figure 2, which shows that the main motivating factor for teachers to use the *Bashaa*r website is to get an exclusive answer, while the main motivating factor for students was to prepare school inquiry assignments. Another main difference between teachers and students is in the use of the website to expand knowledge: 21% of the teachers used the website because of curiosity or in order to expand their knowledge, but there were no students who used the website for this reason. Teachers were found to be more aware than students of the

fact that experts composed the answers to their questions and that they received answers from a reliable source.

B. Satisfaction from the question posing process – The feedback questionnaire consisted of three questions that related to the assessment of the *Bashaar* website:

Q1: Regarding the time that passed from sending the question to the *Bashaar* website until you have received an answer to your question, do you think the response time was: short/ reasonable/ long/ too long (circle your choice). Please explain.

Q2: Did the response you received answered your question? Not at all/ to a small extent/ to a large extent/ absolutely (circle your choice). Please explain.

Q3: In your opinion, the level of the answer you received is: low/ reasonable/ high (circle your choice). Please explain why

Figure 3 presents the frequency of the answers to Q1 regarding the time that passed from sending the question to the *Bashaar* website until receiving an answer.

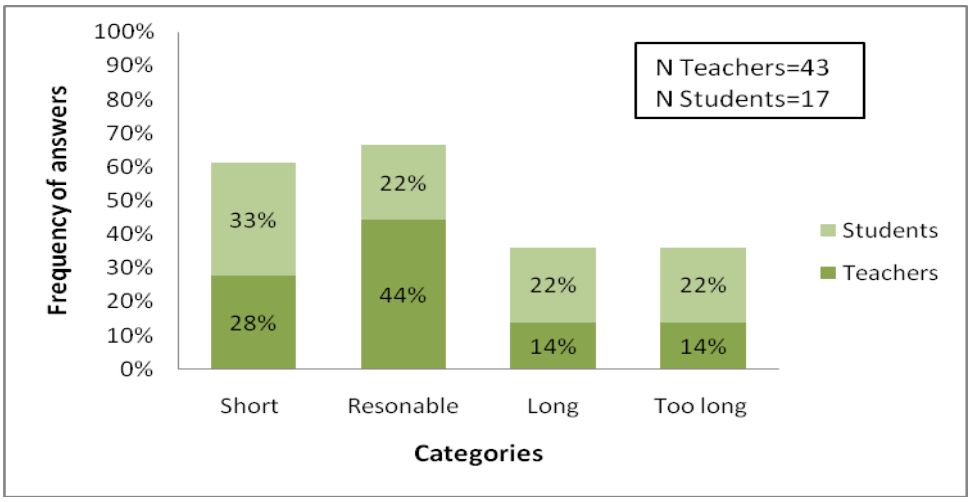

Figure 3: Frequency of answers regarding response duration

The time elapsing from sending the question to the *Bashaar* website until receiving an answer was reasonable for about half of the teachers and short for about one third for the students. Figure 4 presents the frequency of the answers to Q2, which relates to the satisfaction from the answer received. Figure 4 shows that most of the teachers and students were satisfied from the answer they received to a large extent or more. Figure 5 presents the frequency of the answers to Q3, which was related to the level of the answer to the question the user had posed.

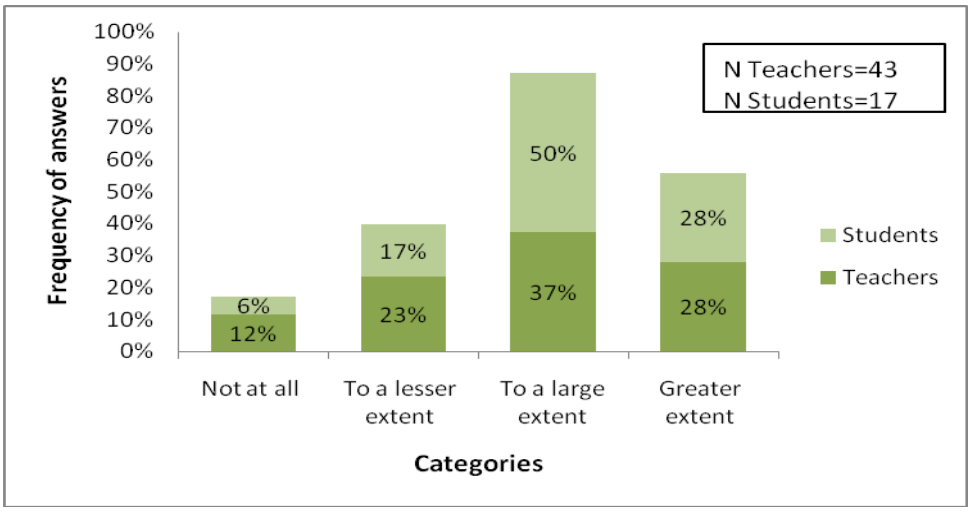

Figure 4: Distribution of satisfaction from the answer, which was received

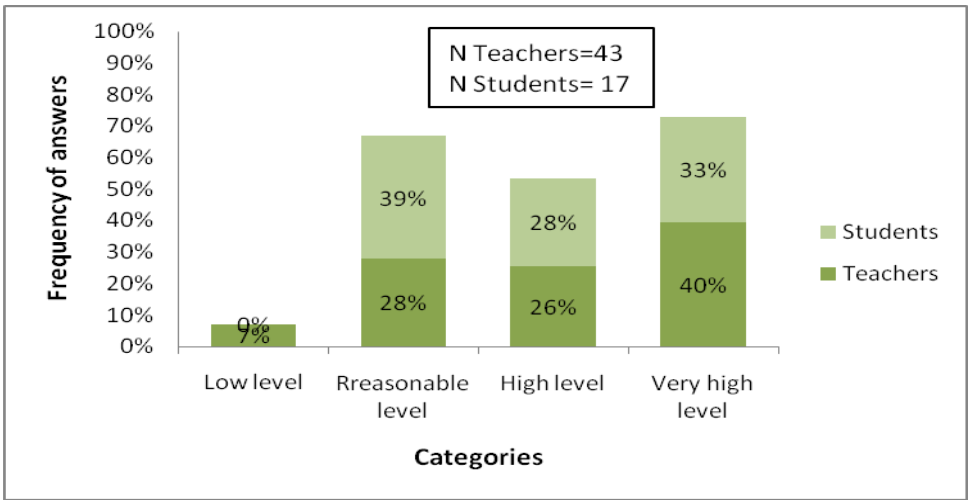

Figure 5: Distribution of users' answers regarding the level of the answer to the question they posed

The results showed that more than half of the teachers and students claimed that the answer they had received via the *Bashaar* website was a high-level response or more.

Discussion

The website provides teachers and students with a framework that they can use when they seek answers to complex questions. The *Bashaar* website enables maintaining contact between experts, teachers, students, and the general public. This academia-community relationship enables knowledge transferring from experts to teachers and students. This relationship has a potential for enhancing the scientific literacy of both teachers and students who have been using the website.

The responses to the questionnaires showed that most of the website users were satisfied and motivated to reuse the website. Indeed, website satisfaction is one of the factors affecting website success, which implies that a satisfied user will reuse the website (Schaupp et al., 2006). Pre- and in-service teachers adopted positive attitudes toward the website contribution. They noted that the main benefits of the website are accessibly to information, the website as an assisting framework, getting answers from an expert, and fostering the development of their students' scientific literacy.

Research contributions and suggestions

The research has a contribution both in the theoretical and practical domains. In the theoretical domain, the research contributes to the body of knowledge of scientific literacy while using websites for teaching and learning.

In the practical domain, the study can encourage more science and engineering teachers to implement it in their classrooms, and provide science educators with a tool for encouraging both students' and teachers' self-designed questions.

We suggest getting feedback on the answer received from the experts for two reasons: (1) It provides the director with an indication about users' satisfaction; (2) It provides the experts with feedback on their answers, so they can better understand if their answer was clear and suitable for the asker.

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