PERCEIVED BENEFITS AND ACTUAL USE OF TECHNOLOGY IN ACADEMIC TEACHING — EVIDENCE FROM AN ENGINEERING COLLEGE

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Abstract

This study focuses on the degree and manner of Higher Education instructors' use of technology in their classroom. It explores the reasons for Information and Communication Technology (ICT) integration, as they are perceived by instructors. To this end, 32 instructors, who attended a professional development session, were asked on several aspects of ICT integration in teaching, using a paper and a pencil questionnaire.

Respondents indicated the high importance of ICT integration in academic teaching and reported use of technology in a way that changes traditional academic pedagogy. However, respondents' reasoning of the importance of ICT integration focused on enhanced efficiency, alignment with current trends and generating interest in class sessions. Moreover, almost thirty percent expressed resistance to the integration of ICT in academic teaching.

These results suggest contradictions between the beliefs and actions of the instructors regarding the integration of ICT in their teaching. Plausible explanation and limitation of the study are discussed in the concluding section of the paper.

Keywords: Information and Communication Technology, Higher Education, Instructors Perspective.

1 INTRODUCTION

In the past few decades, profusion of researches examined the possible added value of Information and Communication Technology (ICT) integration into higher education teaching (e.g.[1], [2]). The impending benefits identified by researchers are divers and numerous. For example, Garrison and Kanuka ([3]) outline the possible potential of ICT in academia and the necessary administrative and management changes that would lead to enhanced effectiveness and efficiency of meaningful learning experiences. Laurillard ([4]) offers a cost-benefit model for productive technology use to facilitate affordable personalized learning.

Nonetheless, most of the studies examining the integration of ICT into education focus on the pedagogical aspects and indicate them as most significant. Among the numerus benefits identified are the personalization of education (i.e, student centered customized learning process, e.g. [5]), the ability to generate a more meaningful and effective learning process (i.e. better learning outcomes, e.g. [6]) and higher students satisfaction (e.g. [7]). However, these promises are yet to materialize. The majority of courses in academic institutes around the globe are taught nowadays in a traditional way, with one instructor in front of a class of dozens of students in a physical classroom. Most of these courses are accompanied by a website, which is mainly used for posting learning materials (presentations, hand-outs, readings, etc.) and administrative purposes (e.g. posting grades, announcement) ([8], [9]).

The actual use and factors influencing use of technology in academic institutes is extensively examined in research ([9]). For example, Usluel et al. ([10]) examined the use of approximately 800 Turkish instructors of technology and found higher use of the technology for administrative purposes then instructional use. Keengwe et al. ([11]), citing others, suggests lack of resources (equipment, time, technical support etc.) as barriers to instructors’ use of technology in teaching. Zhao et al. ([12]) describe similar findings, and suggest instructors’ needs to believe the use of technology will be possible and beneficial for them. Surprisingly, little attention is devoted in research to this matter, i.e. to the perceived benefits of the integration of ICT into academic teaching by instructors in academic institutes. Croteau et al. ([13]) explored the perception of instructors and found that their belief about
the contribution of ICT to students learning was correlated to their computer proficiency. Collis and Wende ([14]) surveyed over 700 academic staff from seven countries in three continents. They did not explore instructors' perception regarding learning, but focused on efficiency, and revealed instructors think technology increase their efficiency in finding resources for courses more than it does for other tasks (managing administrative data about students, routine tasks relating to instructors' teaching, giving feedback etc.). Similarly, Mahdizadeh et al. ([9]) examined the added value of technology as perceived by instructors focused on functionality (i.e. asked for teachers' opinion of the added value of specific technologies) and explored its pedagogical impact frugally. Park et al. ([15]) explored acceptance and use of Learning Management System (LMS) based on the Technology Acceptance Model (TAM,[16]). They operationalized perceived usefulness and motivation to use the technology with questions regarding various areas such as interaction elevation, increased students' performance, efficiency and keeping up with current trends.

This study focuses on the use of technology by instructors in their teaching vis-à-vis benefits of this use, as they perceive it. In other words, the degree and manner of instructors' use of technology in their classroom, as reported by them, as well as the reasons for ICT integration, as the instructors perceive it.

2 METHODOLOGY

Shamoon College of Engineering (SCE), established 15 years ago, is the largest engineering college in Israel with nearly 5,500 students, in six engineering departments. SCE has approximately 160 full time faculty and 400 part time teachers and teaching assistants.

As part of the preparation to the new academic year (2017), instructors from all six departments were invited to a professional development session, focused on best practices in academic teaching and the integration of ICT into teaching. The session was defined as mandatory. However, as was done in previous occasions, no actions were taken to enforce attendance and there were no obvious consequences to those not attending. Thirty two instructors, who attended the four hours session, were asked to fill out a survey, adapted from Martin ([17]). Specifically, the survey was translated to Hebrew (the mother tongue of the respondents) and some non-relevant question were eliminated (e.g. a question regarding teaching discipline and question about the specific technologies used by the instructors that are not relevant to the institute).

3 RESULTS

Most of the 32 respondents (53%) hold a Master's degree, and close to a third (34%) hold a PhD. Half of the respondents have more than ten years of academic teaching experience. Respondents indicated the importance of ICT integration in academic teaching, with an average of 3.37 on a 4 point Likert scale (standard deviation 0.55). Over ninety percent of the respondents indicate that the issue is important (37.5% of the respondents indicated it as very important and 53.1% as important). Regarding past use of technology in their teaching, close to ninety percent (87.5%) reported using ICT in various ways (e.g. course administration, inside and outside class interaction). More than half (54%) reported use of technology in a way that changes traditional academic pedagogy (online forums and quizzes, interactive games in class, etc.).

Most of the respondents' reasoning for the importance of ICT integration focused on non-pedagogic aspects (see Table 1). Close to a quarter (23%) of the respondents suggested that the main contribution of ICT in academic teaching is enhanced efficiency. For example, one instructor suggested that technology saves time, while another pointed the increased availability and accessibility. Other instructors (23%) indicated that ICT usage in teaching is required in order to align with current trends and generating interest in class sessions. For example, one respondent noted that it is imported to adjust the teaching to students' life style and another simply described the reason to use technology as "promotion for promotion". The most common category of reason to use ICT in academic teaching was to generate interest in class (as indicated by 27% of the respondents). As one instructor stated, technology 'wakes up the students'. Less than fifth of the respondents' explanations addressed the learning process, some of them used very general terms ('it helps the student') and others referred to a more specific added value as the clarity of the material and motivation. None of the instructors referred in their answers to the impact of ICT integration on learning outcome (i.e. better understating of course material, higher academic achievements, etc.)
Table 1. Respondents’ reasons for the importance of ICT integration in academic teaching

<table>
<thead>
<tr>
<th>Category of Reason</th>
<th>Number of responses</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase interest in class</td>
<td>7</td>
<td>27</td>
</tr>
<tr>
<td>Fit the generations’ style</td>
<td>6</td>
<td>23</td>
</tr>
<tr>
<td>Administrative efficiency</td>
<td>6</td>
<td>23</td>
</tr>
<tr>
<td>Help the students</td>
<td>5</td>
<td>19</td>
</tr>
<tr>
<td>Help the teachers</td>
<td>2</td>
<td>7.7</td>
</tr>
<tr>
<td>Total</td>
<td>26</td>
<td>100</td>
</tr>
</tbody>
</table>

Close examination of the answers to the reasons why instructors think it is important to integrate technology into academic teaching revealed hidden resistance to the integration by almost thirty percent (29%) of the respondents. For example, one instructor indicated he would like to see researches or statistics on the impact of technology on success of students and understanding of the materials taught. Another indicated it helps convey ideas, but it is not necessary, and yet another suggested it might help but the same achievement and goal can be reached without technology.

4 CONCLUSIONS

The results found reveal interesting reality. Most of the respondents indicated the importance of ICT integration into academic teaching, and act upon these perceptions by integrating ICT in their classes. Moreover, most of them use technology to enhance their pedagogy (for example, use online quizzes and games). These actions are in contradiction to the reasons for the integration as indicated by the majority (two third) of the respondents who focus their reasoning on the contribution of ICT to higher education as a marketing and administrative tool.

This interesting gap is in reverse direction to gaps often found during transformation, which begins with a change in the declarative level before it is exhibited in actions. This may be due to the very gradual bottom up nature of the process of ICT integration in higher education. Moreover, most of the instructors performing this integration are researchers with limited formal pedagogic knowledge and education. It is likely they practice what they feel will benefit their students, without consciously analysing the pedagogical meaning and implication of their actions.

This research presents interesting findings, but is limited in two aspects. First, the small sample (32 respondents), may create bias. Moreover, the selection of the respondents was not random, since only instructors who chose to participate in the professional development session participated in the study. These participants may have greater interest in teaching in general and in technology specifically, compared to their colleague, as they chose to devote their time to the professional development session.

REFERENCES


