

THE UTILIZATION OF WEB-BASED TECHNOLOGY AS PREDICTOR OF FACULTY INSIGHTS OF SUPPORT FOR THE IMPLEMENTATION OF ELEARNING

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ABSTRACT

This study investigates the level of implementation of web-based instructional technology (WBIT) by the in-teaching faculties of English Language departments as factor related to faculty perception of institutional mechanisms and its partial significance as condition supporting the implementation of e-learning in university education. Using a sample of 160 in-teaching faculties at selected Islamic Azad Universities (IAU) across Iran, faculty perceptions of support mechanisms were examined.

The findings of the present study reveal that factors such as stages of apprehension about using WBIT and levels of use offer a justification of the perception variations. Making a profile of faculty WBIT utilization is predicted to provide insight for the development of strategies and administrative practices vital for eLearning to succeed in university education.

Keywords: E-learning, Web-based instructional technology (WBIT), Faculty insight, Implementation of WBIT

INTRODUCTION

For the last three decades higher education institutions have been forced to undergo thorough transformation and revitalization. Parallel to society, a factor that has played a crucial role in transforming higher education is the advance of information technology (IT). The potential for use of IT in education has been increasingly recognized and higher education faculties have begun to use this technology in different ways in their teaching. Instructors today regularly include electronic technologies that extend instructional resources to their students: threaded discussion boards, websites, chat rooms, email, newsgroups, etc. Moreover, because the use of mobile technologies that join with web-based resources is becoming a more common practice, the lines differentiating web-based and face-to-face classroom teaching are becoming less distinguishable.

In 2000, 90% of all institutions that offered distance education courses used asynchronous internet courses as their main technology for instructional delivery (A. Associates, 2000) while around 54% of higher education face-to-face classes used e-mail, 39% used internet resources, and 28% had a website. In addition, approximately one-fifth of all college courses now use electronic course management tools (e.g., Blackboard). Faculty members are concerned with the availability of institutional support, such as resources to advance course redesign, training in the use and application of distance technologies, training in teaching methods, technical consulting, teaching assistants, graphic work, and editing.

The literature depicts that universities provide limited instructional support and it is often perceived as inadequate by faculty (D.C. Ensminger, D.W. Surry, B.E. Porter, and D. Wright, 2004 & CA Granger, ML Morbey, H. Lotherington, RD Owston, and HHWideman, 2002 & J. Lee 2002).

Particularly, the literature shows that faculties perceive the need for administrative support and faculty load and agreed that the most important barriers are the lack of institutional motivations for teaching web-based courses, the lack of ample support systems, the idea that web-based delivery is not proper for all courses, and the lack of recognition from the administrators and peers in the form of credit towards tenure and promotion (L. O Quinn and C. Michael, 2002 & S.K. Rockwell, J. Schauer, S.M. Fritz, and D.B. Marx, 1999 & M. Newman T. Gammill, 2005). In this sense, the lack of administrative support and limited incentives are recounted by the literature as the most frequent environmental factors perceived by faculty, administrators, and staff as obstacles in the implementation of WBIT.

REVIEW OF RELATED LITERATURE

Despite the fact that research recognizes staff development and resource allotment as important factors in the implementation of technological innovations, they are never seen as adequate conditions. Empirical research has found only a small positive impact of professional development activities on implementation of large-scale innovations (F. Geijsel, P. Sleegers, R. van den Berg, and G. Kelchtermans, 2001) and has shown that casual activities such as "just in time learning" and "coaching" are regarded by faculty as most influential (CA Granger, ML Morbey, H. Lotherington, RD Owston, and HHWideman, 2002). Research has also shown that concurrence with the principles of web-based strategies and positive attitudes toward the implementation of web-based technologies do not inevitably correspond to the degree in which faculty actually teach according to those principles (F. Geijsel, P. Sleegers, R. van den Berg, and G. Kelchtermans, 2001).

Also, recognizing that feelings of uncertainty negatively affect the implementation of innovations the existence of leadership as a condition for managing successful implementation of technology has achieved more attention during the last decade (P.S. Owen and A. Demb, 2004).

Particularly, transformational leadership has shown positive effects on the implementation of innovations (F. Geijsel, P. Sleegers, R. van den Berg, and G. Kelchtermans, 2001). A condition often declared is the role of leadership in rousing a common vision about what change means, sharing decision making, supporting change, and modeling the way (R. Albury, 2001 & W. H. Gmelch, 2004 & R. Roepke, R. Agarwal, and T.W. Ferratt, 2000 & C. Romm and N. Pliskin, 1999).

Ely found eight circumstances required for implementing an innovation (i.e., dissatisfaction with status quo, knowledge and skills, resources, time, incentives and rewards, participation, and leadership). Although proved to be present in successful implementations, has neither been clear the role of the setting in which the innovation is implemented nor a hierarchy among the conditions (F. Geijsel, P. Sleegers, R. van den Berg, and G. Kelchtermans, 2001 & CA Granger, ML Morbey, H. Lotherington, RD Owston, and HHWideman, 2002). The evaluation of a technology implementation model by L. Sherry, S. Billig, F. Tavalin, and D. Gibson (2000) suggested that factors that support faculty in the implementation process vary on each stage of implementation.

According to L. Sherry, S. Billig, F. Tavalin, and D. Gibson (2000) while in the first steps the technical support and accessibility to technology is significant, in later stages of implementation leadership and administrative support becomes key factors. L. Sherry, S. Billig, F. Tavalin, and D. Gibson (2000) also recognized that during the advance stage of evaluation, new capacities appeared, leading to new needs and the requirement of new strategies.

Faculty Support and Implementation of E-learning

Research constantly finds that policy is not sufficient to move efficiently from innovation to change; real change is always personal and organizational change always painstaking (R. Evans & Jossey-Bass, 1996). Despite the fact that web-based technology is progressively more being used by university education, the teaching and learning transformation across the curriculum has not yet occurred. Annand (2007) illustrated the technological change predicament: The commonly silent effort underway within the academy to establish the appropriate means to utilize technology – using it to either basically change the way education is delivered to students, or using it to enhance the traditional way that university education has been conducted by replicating the classroom in an electronic environment – is far from be resolved. If creatively employed, considerable transformative change may be realized within recent academic structures (D. Annand, 2007). The extent and nature of web-based applications in university education is still different and in many cases is limited to a few isolated examples (e.g., email communication and posting assignments) (M.M. Groves and P.C. Zemel, 2000 & S.J. Vodanovich and C. Piotrowski, 2005).

“It is still unclear whether resistance to change within the academy constitutes anything other than rearguard action” (D. Annand, 2007); however, L. Sherry, S. Billig, F. Tavalin, and D. Gibson, (2000) suggest that the lack of more highly developed applications of web-based resources in the academia might be due to the lack of competence and proper training in such advanced applications.

Others suggest that obstacles are found in the areas of administrative and technical support (J. Lee, 2002). Yet others have found that factors supporting faculty in the implementation process differ on each stage of implementation (L. Sherry, S. Billig, F. Tavalin, and D. Gibson, 2000).

While including WBIT into instruction obviously depends on faculty members’ skills and experiences, knowing what the appropriate mechanisms are to support faculty in skills development, may depend more on the thoughts and perceptions of the faculty members involved in the implementation procedure than on other demographic variables. This study suggests exploring behavioral and psychological constructs as factors that may manipulate the way faculty perceive the efficacy of support systems.

METHODOLOGY

This cross-sectional study employed quantitative methods which were supported by survey methodology. Using a sample drawn from in-teaching faculties of the English Department in selected Islamic Azad Universities across Iran, level of implementation of web-based instructional technology (WBIT) was investigated as factor associated with faculty perceptions of institutional mechanisms and its relative significance as circumstances supporting the implementation of eLearning. An ANOVA with a Bonferroni-test adjusted, based on number of dependent variables and sample size, was carried out in order to determine how faculty perceptions of conditions supporting the implementation of WBIT varied across levels of implementation.

Instrumentation

Conditions supporting the implementation were used as principle variables and operationalised using D. P. Ely's, (1990) eight conditions that facilitate innovations. Levels of implementation were assigned to each participant based on measures of Levels of Use of technology (LUT) and Stages of Concern (SC) grounded in the Concerns-Based Adoption Model (CBAM).

Faculty members were assigned to one of two categories of SC (self, task, impact), and one of three categories of LUT (preparation, focus on use, focus on improvement). A factorial ANOVA was carried out with SC, LUT, as the independent variables, and eight conditions as dependent variables (i.e., dissatisfaction with the status quo, knowledge and skills, resources, time, rewards, participation, leadership, commitment). Table I shows a summary of variables.

Table: 1
Summary of Variables Used in the Study.

Conditions Supporting Implementation of WBIT (DVs)
C1. Dissatisfaction with status quo C2. Knowledge and Skills C3. Resources C4. Time C5. Incentives and rewards C6. Participation C7. Leadership C8. Commitment
Predictors: (IVs) 1. Concerns level (SC) -Self - Task - Impact 2. Levels of use of technology (LUT) - Nonuse / Preparation - Focus on Use - Focus on Improvement

Data Collection

The data was collected through a questionnaire, consisting of 70 questions, distributed in five multiple choice sections. After deletion of cases with missing values for stages of concern, data from 482 participants were available for analysis.

RESULTS

Descriptive statistics provided the participants' perception mean responses and standard deviations for the eight dependent factors (Ely's conditions). Overall perception mean responses revealed the relative importance of each condition as perceived by faculty. Knowledge and Skills (M = 6.548, SE = 2.947), and Time (M = 6.553, SE = 3.072) were perceived by faculty as the two most important conditions apart from the concern stage or level of use of WBIT; while Incentives and rewards (C5) was found the least important condition overall (M = 3.521, SE = 2.588).

Results of Multivariate Main Effects

SPSS multivariate tests offered significant results of faculty perceptions of conditions for the successful implementation of WBIT. Particularly, a Factorial MANOVA showed statistically significant multivariate main effects for Levels of Use, Wilk's Lambda = .958, $F(15, 702) = 2.948$, $p = .065$.

Univariate tests illustrated significant main effects of Levels of Use for Leadership ($F=6.220$, $df = 2$, $p=.008$), Participation ($F=5.153$, $df= 2$, $p=.019$), and Commitment ($F=8.995$, $df =2$, $p=.001$). Results of univariate and post hoc analysis per condition for the significant main effects are provided as follow.

Leadership

The obtained mean values for the dependent variable Leadership (C7) of faculty in preparation ($M=4.356 \pm .456$), focus on use ($M=4.296 \pm .192$), and focus on improvement ($M=5.147 \pm .219$) demonstrate the perception of faculty regarding the condition Leadership which is understood as the level of ownership and support given by the leaders, including providing encouragement and serving as role models stakeholders in the implementation of WBIT.

Multiple Comparisons Post Hoc revealed significant mean differences among faculty members in focus on improvement as compared with faculty members in focus on use. Faculty members in the highest LUT (i.e., focus on improvement) perceived the need for leadership significantly more important than those faculty members in focus on use. There weren't any significant differences between faculty members in preparation and focus on use.

Participation

The obtained mean values for the dependent variable Participation (C6) of faculty in preparation ($M=5.137 \pm .322$), focus on use ($M=5.030 \pm .149$), and focus on improvement ($M=4.399 \pm .192$) illustrate the perception of faculty regarding C1 which is understood as the level of stakeholders' involvement in the decision making process to accept and implement WBIT. Results suggested that once the LUT focus on improvement is met, the need for participation decreases in importance as a condition for implementation.

Lower levels of LUT were significantly more related to higher ranks of Participation as an important condition. Multiple Comparisons Post Hoc tests revealed significant mean differences only for faculty members in focus on improvement as compared with faculty members in focus on use. Faculty members in the focus on use perceived the need for participation significantly more important than those faculty members in focus on improvement (mean difference= .685)

Commitment

The obtained mean values of faculty in preparation ($M= 4.042 \pm .468$), focus on use ($M= 3.962 \pm .280$), and focus on improvement ($M= 5.400 \pm .264$) show the perception of faculty regarding the condition Commitment (C8) which is understood as the "visible" support by the upper level leaders or powerbrokers in the implementation of WBIT.

Results depicted that the increase in importance of the condition Commitment was associated with faculty members in the upper LUT (i.e., focus on impact). In other words, there is evidence that as faculty develop in their use of WBIT, the need for commitment increases. Multiple Comparisons Post Hoc tests showed significant mean differences in the perceptions of faculty in preparation and those in focus on improvement.

Also significant differences were found between faculty members in focus on use and those in focus on improvement. Faculty members in focus on improvement perceived the need for commitment significantly more important than faculty members in preparation and focus on use. However, no significant differences were found between faculty members in preparation and those in focus on use.

Results of Multivariate Interaction Effects

SPSS multivariate tests provided results of faculty perceptions of conditions for the successful implementation of WBIT when faculty SC and LUT were taken into consideration.

In particular, a statistically significant multivariate interaction effect for LUT by SC was found (Wilk's lambda= .920, $F(38, 1240) = 3.175$, $p = .001$). Results of univariate tests revealed significant differences between the mean values for the following dependent variables:

- Knowledge & Skills (C2) $F=4.159$, $df=4$, $p = .015$;
- Dissatisfaction with status quo (C1) $F=9.696$, $df= 4$, $p = .001$.

Disordinal interaction of LUT by SC for C2 suggested that the need for knowledge & skills at different LUT is not consistent along different levels of SC. As faculty members in the upper SC continues to use WBIT their need for knowledge & skills decreases; however, self-concerned faculty members seem to have an increased need for knowledge & skills as they move towards upper LUT levels.

Post Hoc analysis revealed that faculty members in task SC perceived the need for knowledge & skills significantly more important than faculty members in self SC. Disordinal interaction effects of LUT by SC for C1 suggested that the need for Dissatisfaction with status quo (C1) at different LUT levels is not constant along SC levels. Faculty members in the upper SC (i.e., impact) perceived Dissatisfaction with status quo consistently less important across LUT. For those faculty members with task concerns, the need for Dissatisfaction with status quo boosts in the upper LUT; however, for faculty members with self concerns, the need for Dissatisfaction with status quo declines consistently as they move from lower to upper LUT levels. Within preparation LUT, faculty members in self SC expressed the largest need for knowledge & skills; conversely, within the focus on improvement LUT, self-concerned faculty members presented the lowest rank of C1. Post Hoc analysis of significant interaction effects for C1 exposed that the differences in mean values of faculty in self-concerned faculty members by LUT (specifically preparation and focus on improvement) as compared to task-concerned faculty and impact-concerned faculty members were responsible for the interaction significance. The opposite is true for faculty within focus on improvement LUT. Faculty members with task concerns perceived the need for knowledge & skills significantly more important than faculty members with self concerns. The mean values of the interaction effects of LUT by SC for C8 recommended that faculty members in the upper SC (i.e., impact) perceived the need for commitment consistently more important across LUT than faculty members in the lower LUT. Post Hoc analysis of significant interaction effects for C8 suggested that the differences in mean values for focus on improvement were responsible for the interaction significance.

Within focus on improvement LUT, impact-concerned faculty members ranked the need for commitment significantly higher than faculty members with self and task concerns. Within lower LUT, the need for commitment was ranked constantly lower than for the upper LUT.

CONCLUSIONS AND FURTHER RESEARCH

This study suggested an empirical model for universities to develop a more accurate profile of their faculty views and needs in terms of support mechanisms that facilitate the implementation of web-based instructional technology. The development of such a profile is predicted to provide insight for the development of strategies, especially related to the improvement of professional development activities, leadership interventions, and administrative practices necessary for eLearning large scale implementations to succeed in universities. Regarding all participants, knowledge and skills, and time are the conditions considered as most important.

However, findings revealed that there are significant differences in the relative importance of conditions across different levels of implementation of web-based technology use. Factors that support faculty in the implementation process differ on each stage of implementation. Time was rated higher in importance by faculty members having low levels of use. On the other hand, high levels of use rated Time as less relevant condition.

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