Comparing Perceptions: A Secondary Analysis

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ABSTRACT – This paper presents a secondary analysis of data from a study of critical success factors for the adoption of innovative technology in higher education. Using aggregated statistical data from the earlier study, the analysis carried out in this paper focuses on identifying both the similar and different perceptions of two key groups. By doing so, highlighting factors perceived as common or unique to each group may facilitate the successful adoption of innovative technology. Furthermore, it is proposed that the method of surveying, interviewing and analysing the perceptions of experts and study participants may have application in other contexts, such as the schools education environment.

Keywords— schools, technology adoption, critical success factors, management, perceptions

INTRODUCTION

A paradox between technology and productivity in schools education has been identified, where technology adopted by schools to improve productivity, without taking into account context, has sometimes resulted in no, or negative changes in productivity [1]. The perception of what critical success factors (CSF) apply for the successful innovation, adoption and diffusion of technology may be one of the many contexts that has caused this paradox. A study by Dennison to understand the perceptions of CSFs between faculty members and information technology (IT) leaders influencing the adoption of innovative technology, resulted in a Higher Education CSF model [2]. This paper presents a secondary analysis of the data from the study by Dennison to highlight both common and unique perceptions between each group. Firstly, to understand where perceptions differed widely, or were similar, for the successful adoption of innovation and secondly, to determine if a similar method could be used to study complex issues in schools education, such as the technology-productivity paradox.

LITERATURE REVIEW

CSF framework in education

After reviewing the CSF literature, Dennison claimed that frameworks of CSFs have come from four types of studies into: organisation contexts, the context of research and practice, the organisational implementation strategies of systems and stakeholder groups [2]. These frameworks were then adapted for a higher education context to study the perspective of both faculty and IT leaders about the successful innovation, adoption and diffusion of technology on the university campus [2].

METHOD

The study of faculty member and IT leaders’ perceptions of critical factors for successfully adopting innovative technology used a case study across a single university. The study used a mixed methods approach to obtain: quantitative data from a survey of the importance of CSFs in different contexts; and qualitative data from open-ended questions and interview responses. The data was obtained in four phases: Firstly, through a survey of peer experts where CSFs were identified from aggregating and analysing the data and ranked according to their frequency; secondly, from interviews with selected peer experts who confirmed that the CSFs were valid; thirdly, the top ranking CSFs were then used for a second survey of study participants; and lastly, through interviews of selected participants. The results of this survey were then analysed to determine where each CSF ranked compared to the experts’ median CSF and for university performance [2].

For this paper, each CSF for each group and context was tabulated from the statistical data of the earlier study. In the new tables, the mean value for each CSF was replaced with a numeric code from one to 17 to represent where each group ranked each CSF. The value one represented the lowest rank and 17 the highest. An average rank was calculated for each CSF by averaging the value assigned by each group. CSFs were then sorted in descending order of the average rank and graphed using pivot charts. The analysis was carried out visually in two stages: firstly, by identifying CSFs ranked equal to or above the group median as relatively more important than those below, and secondly, by identifying CSFs ranked with similar values as common to both groups and with relatively different values as unique to one.

RESULTS

The ranks of the CSFs from the expert survey (Fig. 1) and the dual purpose participant survey were graphed. CSFs were ordered from left to right in descending order of their relative importance by the average rank of both groups, shown by the decreasing linear green line. The blue column represented the rank given by the faculty members and the orange column showed the rank given by the IT leaders. CSFs considered relatively more important by one group compared to the other were identified by a column that peaked above the green line and the other column well below.

Fig. 1 CSFs ranked by expert Faculty members, IT leaders and their average
Using the above method of analysis, the important CSFs common to both groups (Fig. 2.) were: Professional Development and Training; Executive and Administrative Level Support; Stakeholder Involvement; Skill Level and Commitment of Faculty and Students; and the Availability of Resources and Financial support.

However, faculty members had a CSF that was important to them that IT leaders did not. Namely: Incentive, Rewards and Time for Innovation (Fig. 5). On the other hand, IT leaders had two relatively important CSFs, which faculty members did not. Namely: Stakeholder Involvement; and Executive and Administrative Level Support (Fig. 5).

However, CSFs considered relatively more important by faculty members than by IT leaders were: Availability of Skilled Technical Support; Innovative Culture and Collaborative Environment; Incentives/Rewards/Time for Innovation; and Availability of Technology and Infrastructure (Fig. 3). On the other hand, expert IT leaders ranked some CSFs as relatively more important than the faculty members, namely: Proven Effectiveness; Quality Reliability and Flexible Technology; Strategic Planning and Governance; and Project Management (Fig. 3). Common and unique perceptions were also identified from the two surveys of the study participants.

When participants ranked the CSFs in context of their university’s performance (Fig. 6.), CSFs considered as relatively important by both groups were: the Availability of Technology and Infrastructure; Enhances Teaching and Learning; Executive and Administrative Level Support; Ease of Use; and Quality, Reliability and Flexibility of Technology.
However, the faculty group ranked three CSFs relatively more important than the IT leaders: The Availability of Skilled Technical Support; Availability of Resources and Financial Support; and Professional Development and Training (Fig 7). On the other hand, the IT leaders ranked three CSFs as relatively more important. Namely: Project Management, Proven Effectiveness; and Stakeholder Involvement (Fig 7).

**ANALYSIS**

Implications from these results are that the method seemed to successfully distinguish: CSFs considered important by both faculty members and IT leaders; CSFs considered unique to each group; and CSFs that varied between contexts, namely, when the expert groups were asked to identify CSFs, and when the study groups were asked to rank the CSFs relative to, firstly, the expert median and secondly, to the performance of the university.

Interestingly, no CSFs were ranked important across all three contexts. However, some CSFs were perceived as important in two contexts, for example, CSFs ranked important relative to the expert median and for the performance of the university were: Enhancing Teaching and Learning as well as the Quality, Reliability and Flexibility of the Technology. Thus, it is possible that the successful adoption of innovative technology does not rely so much on addressing CSFs alone, but more likely on the awareness of the context and addressing key CSFs relevant to the context.

In addition, finding key CSFs that were perceived as relatively more important by either the faculty members, or IT leaders, may reflect CSFs that actually hinder the successful adoption of technology. If so, being aware of these CSFs may help focus actions to resolve related issues impacting negatively on the adoption of new technology. For example, in terms of the university performance (Fig. 7.) the: Availability of Skilled Technical Support; Availability of Resources and Financial Support; Professional Development and Training and Stakeholder Involvement.

Finding common and unique CSFs in this way may also be useful for groups outside the higher education context. It is considered feasible that similar CSFs could be identified by surveying experts in the schools education sector or analysing (if it exists) secondary data and then using the results to survey groups within schools. Such school-based CSFs in current literature could include IT competence [3], leadership context, the perceived role of both the teacher and principal [4], professional development, and the availability of resources and support [5]. If so, building on common CSFs and addressing issues arising from unique CSFs could provide leverage for the successful adoption of innovative technology to eliminate (or at least reduce occurrences of) anomalies such as the paradox between technology and performance in schools education.

**CONCLUSION**

This study analysed secondary data to identify common and unique perceptions of faculty members and IT leaders in different contexts. Although it is clear that CSFs for adopting innovative technology were not found universal for all contexts, the method of asking an expert group for CSFs, then surveying a larger number of study participants to rank the CSFs in specific contexts did return results that could be analysed between groups for the context surveyed. Further analysis carried out in this study suggests that it may also be possible to identify common and unique perceptions between groups that may help improve benefits from common CSFs and resolve issues arising from unique CSFs impacting the implementation of innovative technology. Finally, surveying experts and study participants from the schools education environment appears feasible for future investigation into the perceptions of CSFs impacting the successful adoption of innovative technology in schools.

**REFERENCES**


