Designing a System for Enhancing the Sharing of Best Teaching Practices among Universities' Instructors

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***Abstract*— Many universities still face difficulties when attempting to improve the sharing of knowledge accumulated by instructors, due to geographical and social constraints. Insufficient knowledge sharing can significantly hinder the successful implementation of teaching expertise, and this can affect instructors' teaching performance and may result in lower levels of learner attainment than could otherwise have been achieved. In this design science research, we therefore propose (1) a prototypical teaching practices management framework (TPMF) and (2) a set of design principles and features for an information system that support the sharing of BTPs and may constitute a viable alternative to traditional approaches. The development of TPMF, the design principles and features has been informed by interviews conducted with 22 instructors. In this research-in-progress paper, we present our preliminary results and discuss next steps.**

Keywords-design science research, knowledge sharing, knowledge management system, higher education institutions.

I. INTRODUCTION

The literature review highlighted the problem of ineffective sharing of best teaching practices (BTPs) among higher education academics; this is largely because its successful implementation depends on a wide range of critical factors within and outside the educational environment [1]. BTPs can be defined as representing the knowledge related to the delivery of curricula that has resulted from the accumulation of academics' experience gained through years of teaching; BTPs based Knowledge Management has been applied widely, has been proved to be very effective and so, as a model, it can be strongly endorsed. Many authors have highlighted the potential benefits of managing the BTPs which emerge from teaching activities in universities. They mention that managing such teaching experiences has the capacity to facilitate access to published knowledge sources within the academic community, improve overall teaching quality, and enhance the academics' professional development efforts [2, 3]. Without the sharing of BTPs, academics tend to continuously reinvent their practices, and this leads to a situation whereby there is no way of leveraging experience and expertise [4]. It is essential to create and provide an appropriate environment and technical conditions whereby instructors can create, transfer, share and then apply knowledge effectively [5].

The current knowledge sharing approaches employed in universities require instructors to consume a great deal of time and effort to capture, retrieve and reuse BTPs. Hence, we suggest that a framework and a supporting information system should be developed in order to resolve this. Therefore, we aim to achieve two research goals (RG):

RG1: Define a framework for enhancing the sharing processes relating to BTPs which can be performed with the help of an information system.

RG2: Propose the design principles and possible features of an information system specific to the higher education context which must be taken into account in order to enhance the sharing of BTPs and motivate instructors to participate voluntarily in the sharing processes.

To carry out our study and achieve the study objectives, we follow the DSR methodology introduced by Peffers, Tuunanen, Rothenberger and Chatterjee [6] as shown in Figure 1. DSR is based on a paradigm focused on the designing of innovative, purposeful artefact [7].

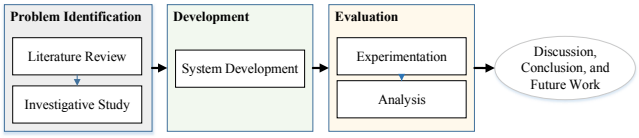

Figure 1. Research Process

II. PROBLEM IDENTIFICATION

As a first step, we identified the problem. To this end, we first conducted a semi-structured interviews with 22 academics (five heads of department, five assistant professors, eight lecturers and four teaching assistants) working in two universities in Saudi Arabia - in order to better understand the academics' actual knowledge sharing behavior in relation to BTPs and also to gain a systemic and overall perspective of the current knowledge sharing approaches. The interviews consisted of a number of open-ended questions selected on a pragmatic basis in order to facilitate interviewees reflections on their knowledge sharing experience. An inductive coding approach was employed to

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help the researcher extract themes which were mentioned by the interviewees.

When the participants were asked how they record and share their BTPs, all of them admitted that documented teaching experience knowledge often lacks structure, quality, and/or contextual information; this may negatively affect the application and reuse of such knowledge. Without the ability to record such knowledge appropriately, the respondents agreed that searching for such knowledge would cost them excessive time and effort. The majority also revealed that they sometimes store the knowledge resources under their purview on random storage facilities such as PCs, drives, on shelves and in shared folders. Consequently, there is a noteworthy duplication of effort in the educational sectors, resulting in the notable near duplication of volumes of written course-related knowledge [4]. Furthermore, the results also revealed that instructors often considered that there was the lack of motivation to share their teaching expertise others. They "*... do not share because they do not receive acknowledge in return for sharing of knowledge*".

We concluded that capturing and retrieving teaching practices is seen by instructors as important but the current knowledge sharing approaches are neither adequate nor effective. Thus, a solution to the underlying issues was sought. After reviewing various knowledge management frameworks, it was found that none of the existing, relevant frameworks have been designed specifically for the context of higher education, and so do not provide solutions that fit instructors' specific needs. Hence a new and practical framework is proposed in this research.

III. DEFINE THE OBJECTIVES OF A SOLUTION

Building on the interviews' results, we developed a Teaching Practices Management Framework (TPMF) which aims to proactively support the sharing of BTPs and overcomes the limitations discovered in current knowledge sharing approaches, depicted in Figure 2.

The complete, clear and consistent documentation of a BTP is vital [8]. Therefore, the first meta-requirement (MR) for the design of a TPMS, **MR1,** is the necessity to provide facilities for ***documenting BTPs in a comprehensible format which can be understood and reused by others***. To meet this requirement, a **knowledge acquisition** process is proposed which enables instructors to identify and input their BTPs. The framework adopted a Best Teaching Practice Document Template (BTPDT), the structure of which was designed based on instructors' expressed requirements in relation to describing BTPs in a detailed and systematic way.

Instructors also stated that reading complex BTPs documents line by line to find key information could be time-consuming and that this led to ineffective knowledge reuse. Therefore, (**MR3**) ***instructors should be able to search for specific knowledge objects or search the knowledge repository for new methods, skills, and best practices***. Hence, a **Knowledge Retrieval** process has been proposed in order to address these issues. Powerful retrieval capabilities as regards content and people can be offered via the implementation of a query-based search facility [9]. Once the knowledge is retrieved, teaching practices may be put to use - to solve problems, make decisions, improve efficiency, or promote innovative thinking. **Knowledge Reuse** is a valuable phase of TPMF, as Choi, Lee and Yoo [10] conclude in their work, *"no matter how much knowledge is shared among team members, it cannot enhance team performance unless it is effectively applied*." Therefore, (**MR4**) ***instructors should be able to retrieve knowledge resources in order to learn about new teaching methods and then apply them in the context of their work***.

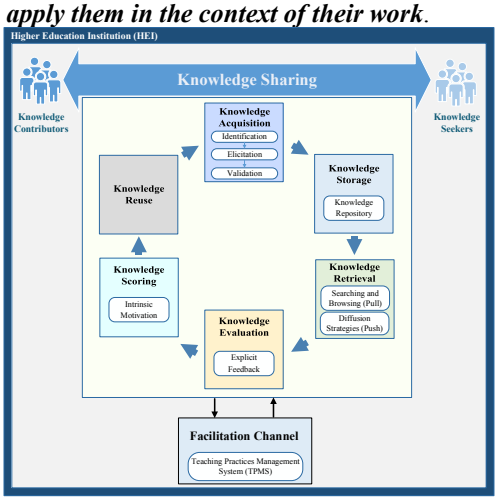

Figure 2. Teaching Practices Management Framework (TPMF)

It is essential that instructors are motivated to voluntary participate in the sharing of BTPs. Therefore, ***(MR5) the system should motivate knowledge contributors.*** **Knowledge Scoring** is proposed in order to meet this requirement. One of the assumptions made in social exchange theory is that "benefits obtained through social process are contingent upon benefits provided 'in exchange" (Emerson [11], p. 32). Thus**,** providing explicit feedback is a powerful and useful mechanism enabling users to express their interest in particular knowledge objects. Appropriate feedback will allow academics to understand that sharing their knowledge helps others, in turn, increasing their sense of self-worth and self-efficacy [12].

Furthermore, explicit feedback facilities are the best way of capturing judgments because they reflects the users' own evaluations [13]. ***(MR6) Instructors should be able to provide their feedback on, and evaluate existing teaching practices to ensure that the knowledge compiled and stored is constantly evaluated and updated.*** Thus, an important aspect, catered for in the framework, is **Knowledge Evaluation**. Facilities for providing explicit feedback fulfil the maintenance of information concerning the actuality and usefulness of the documented teaching knowledge.

Surrounding the abovementioned knowledge sharing processes is an enabling technology we have termed the "***Facilitation Channel***." The proposed framework assumes automation - the use of a web-based teaching practices management system (TPMS) that facilitates the flow of knowledge between academic members and supports knowledge acquisition, storage, retrieval, evaluation, motivation, and reuse.

IV. Design and Development

The results of the framework are the design principles and features shown in Table 1; each feature is associated with one of the knowledge-sharing processes proposed in the TPMF. For future work, a new system will be designed based on our framework and design features. Then, an experiment will be conducted to assess the users' experiences of the system, employing a mixed-methods approach: an analysis of the user-interaction log files and interview sessions.

V. Conclusion and Next Steps

We use the DSR methodology to propose a framework that includes facilities whereby instructors can capture, share, retrieve and reuse BTPs. The proposed framework provides more flexibility, allowing for feedback and the reuse of differing knowledge resources and leading to a cycle supporting the continuous sharing of knowledge. Therefore, in terms of actual practice, the proposed framework may become a guideline for developing systems aimed at improving BTPs sharing among academics. The proposed design principles may be applied to the (re-)design of other KMS and the development of new information system artefacts. The study may suffer from potential limitation associated with the single informant and the single technique of data collection used. All the respondents were academics from Saudi Arabia, and convenience sampling was used to reach them. This may limit the generalizability of the findings.

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TABLE I. The proposed meta-requirements classified into six categories and the design principles and design features which have been derived.

Topic	Meta-Requirement (MR)	Design Principle (DP)	Design Feature
Knowledge Acquisition	**MR1**: The system should provide facilities for documenting BTPs in a comprehensible format which can be understood and reused by others.	**DP1**: Provide contextual knowledge via structured documents.	**Authoring tool:** Best Teaching Practice Document Template (BTPDT)
Knowledge Storage	**MR2**: Created knowledge should be codified and stored in databases from which it can be accessed and easily used	**DP2**: Ensure access to experts and expertise.	**Knowledge repository:** knowledge bases
Knowledge Retrieval	**MR3**: Instructors should be able to search for specific knowledge objects or search the knowledge repository for new methods, skills, and best practices		**Search tools:** Pull functionality Keyword searching Keyword browsing Asking questions Push functionality Recommendations
Knowledge Reuse	**MR4**: Instructors should be able to retrieve knowledge resources in order to learn about new teaching methods and then apply them in the context of their work		
Knowledge Scoring	**MR5**: The system should motivate knowledge contributors	**DP3**: Provide incentives for contributing teaching knowledge based on feedback regarding the usefulness of teaching experiences.	**Explicit feedback tools:** Vote-up Rating Written feedback Reputation level tool
Knowledge Evaluation	**MR6**: Instructors should be able to provide their feedback on, and evaluate, existing teaching practices to ensure that the knowledge compiled and stored is constantly evaluated and updated	**DP4**: Enable knowledge maintenance based on feedback concerning knowledge usefulness.	