Abstract—Guided Personal Learning Environment concept (gPLEc) is a novel PLE-building methodology which seeks to fulfill emergent learning needs of a learner through incorporating teachers’ guidance element in learners’ PLE-building activity. Using Social Semantic Web (SSW) and Recommender System (RS) technologies the gPLEc integrates teachers’ PLE-based learning competencies and learners’ social web and interaction history data to generate personalized recommendations for each learner. The results, achieved so far, confirm importance of teachers’ guidance element for successful implementation of the PLE vision. The expected outcome of this exploratory research is to gain knowledge to construct personalized elearning systems.

Keywords—Personal Learning Environment; PLE; teachers’ PLE-based learning competencies; guidance; social semantic web; ontology; recommender system

I. INTRODUCTION

PLE is a social-web based highly personalized yet socially-mediated collaborative learning platform that seeks to fulfill unique, emergent, and anywhere-anytime learning needs of today’s learner [1]. PLE-building is an online social learning activity through which a learner aggregates information, people, resources, and services at one place to construct knowledge [2]. PLE idea offers learners to define their learning path (goals, needs, and knowledge domain) with expert and peer support [3].

Availability of guidance to define learning path of a learner is very important feature of the PLE vision [4]. As argued in [1], today’s learners lack of technical proficiency and expertise to develop effective PLEs. They do not possess necessary self-regulated learning skills and knowledge management competencies to manage their learning [5][6]. Thus, the researchers present the gPLEc—a novel PLE-building methodology which integrates teachers’ PLE-based learning competencies and learners’ social web and interaction history data to provide expert recommendations to learners which are consistent with each learner’s knowledge, goals, and preferences (Figure 1).

The gPLEc seeks to develop PLE-based learning competencies among teachers and learners so that they cope with 21st Century teaching and learning challenges. The central tenet of the gPLEc is that individuals learn in environments (formal or informal learning environments) and that they customize their environments (design) according to their learning path to learn the way they deem fit (personalization, autonomy, control) and that in doing so they investigate resources (inquiry) and that they need support (guidance) to manage their learning. The gPLEc augments learners’ informal learning pathway-experience. Based on a personalized recommending mechanism [4] it exploits teachers’ PLE-based learning competencies [1] and learner’s profile and activity history data to provide ontology-based personalized recommendations to learners for similar people, learning artefacts, and semantic structures that cater to their knowledge, goals, and preferences. Through this mechanism learners will get recommendations on formulating learning goals, identifying relevant artefacts and experts, and learner interaction and context [8].

Figure 1. Guided PLE Concept (gPLEc)

Using SSW and RS technologies as in [5] and [7], the researchers intend to develop ontology-based recommender logic that iterates through four steps to generate personalized recommendations for each learner (Figure 2).

Figure 2. Four Iterations of the gPLEc
II. Motivation

Given below are results of research conducted within 21st Century teaching and learning challenges context which motivated the researchers to undertake this study.

- Extensive use of Web 2.0 tools causes learners to information-overload problems (such as, stress, anxiety, and reduced work efficiency) [7].
- Not all learners of today are independent learners [1]. They do not possess necessary self-regulated learning skills and knowledge management competencies to define their learning path [5][6].
- Today’s learners lack of technical proficiency and expertise to develop effective PLEs [1].
- It takes time and effort to understand online culture, get familiar with online communication modes, and develop technical skills to be autonomous [9].
- Today’s learners need teachers’ guidance and institutional support to benefit from the PLE vision [6].
- Pedagogical shift toward learner-centred, interdependent and collaborative modes of inquiry would prove to be important interventions for self-directed learning [8].
- Appropriate recommendation is deemed essential that enables learners to keep their PLEs enriched with the most suitable learning resources; thus, avoiding information-overload problems [4].
- Today’s learners need recommendations on formulating learning goals, identifying relevant artefacts and experts, and learner interaction and context [8].
- PLE-based learning competencies of teachers can be mechanized to leverage the path to emerge worthwhile and long-awaited personal learning system [1][3][8].
- Current PLE systems exploit recommendation mechanisms. But, they do not incorporate teachers’ guidance element in their designs [1].

III. Research Objectives

This research proposal pursues today’s teachers and learners to be able to quickly adjust to 21st Century teaching and learning challenges. The researchers intend to prove that an effective PLE can fulfill unique, emergent, and anywhere-anytime learning needs of today’s learners. Thus, the gPLEc seeks to inculcate in learners teachers’ PLE-based learning competencies in order to enable them to become self-regulated and life-long learners. The researchers argue that their proposed concept has potential to leverage the path to emerge worthwhile and long-awaited personal learning system.

Thus, to achieve their goal, the researchers split this research proposal into three phases (Concept, Theory, and Practice) and four objectives as given below:

1. To identify basic building blocks or components of the gPLEc;
2. To determine essential characteristics of basic components;
3. To identify theories underpinnings the gPLEc; and
4. To incorporate essential characteristics of basic components in any existing PLE design.

IV. Research Methodology

This exploratory research is planned to be carried out using mixed-methods research approach. As noted in [10], “using more than one method to gather evidence converges to lines of enquiry and allows form of triangulation to occur, which, therefore, more likely to provide more convincing and accurate information” [11]. To date, the researchers have successfully completed three objectives.

To achieve first objective—to identify type of support required to build a meaningful PLE—the researchers performed comprehensive literature review covering period between 2006 and 2013 as in [3]. The results, as in [3], confirm significance of teachers’ guidance element for successful implementation of the PLE vision.

Second objective determines teachers’ competencies for PLE-based learning. These were required: (a) to generate personalized recommendations using SSW and RS technologies; and (b) to devise a mechanism that inculcate these competencies in learners to allow them to become self-regulated and life-long learners. In [3], the researchers explored teachers’ PLE-based learning competencies against five categories: planning, instructional, communicational, managerial, and technological competences. Later on, as in [1], the researchers get these competencies verified from international experts of the PLE field through Delphi probe. The researchers relied on modified version of Policy Delphi study to include lateral themes, if any [12]. In [6], the researchers devised a mechanism to inculcate these competencies among learners.

Third objective seeks to know whether and how the gPLEc is supported by major learning theories and pedagogical models. It has been determined [submitted] through an exploratory research study that major learning theories which are either teacher-centric or learner-centric support the gPLEc. Thus, the researchers argue that the gPLEc is authentic and valid.

In fourth objective, the researchers intend to develop an integrated recommendation mechanism which integrates teachers’ PLE-based learning competencies and learners’ profile and interaction history data to generate personalized recommendations for each learner. Any PLE prototype, as one developed by [2], will be used to test the results and implications for future practice and policy will be discussed.

V. Expected Contributions

This study makes significant contribution to the research on 21st Century teaching and learning challenges in general and to the body of knowledge on PLEs in particular for a number of reasons, four in particular are discussed.

Firstly, it supports an informal learning process of a learner, the PLE-building process, with a formal learning process, the availability of guidance. This feature adds
learning-related monitoring and guidance in individuals’ learning pathway - experiences without harming learner personalization, autonomy, and control issues. Secondly, it lays to a greater understanding of whether and how the gPLEc is supported by major learning theories and pedagogical models. Thirdly, it paves the path to emerge a meaningful PLE that generates accurate and personalized recommendations through leveraging SSW and RS technologies. Finally, it provides insights for how teaching and learning experience in the 21st Century phenomenon can be enriched with social and semantic web technologies.

REFERENCES


