



Theoretical Underpinnings of the guided Personal Learning Environments Model

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Abstract

- ▶ The guided Personal Learning Environments (gPLEs) model incorporates teacher-based guidance mechanism into the online learning environments.
- ▶ It contributes to the “support” or “guidance” element of the PLE concept.
- ▶ This work discusses gPLEs model with respect to its foundations in popular social and learning theories and pedagogical models.
- ▶ With this work, we aim to prove that teacher-based guidance is essential for both physical learning environments and virtual learning environments.



Motivations

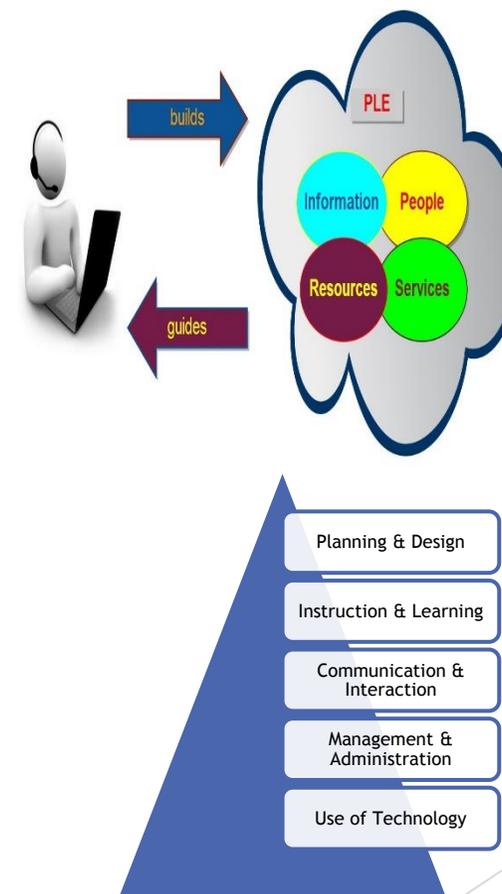
- ▶ Online learning environments' features such as personalization, collaboration, networking, inquiry-based learning, open accessibility and interactivity, ease of use, and repurposing of information affect teaching and learning practices [1,2].
- ▶ They offer individuals to combine their personal and professional interests, augment their learning processes, and to learn from each other's skills / knowledge / experiences [3,4].
- ▶ Abundance of information on these environments, however, causes individuals' information-overload-problems [5,6,7].
- ▶ Fortunately, PLE concept has implications for open access, online learning, and information-overload challenges, as well as for learner-based guidance, self-direction, and self-regulated learning issues [8,9].

Personal Learning Environment

- ▶ An easily customizable learning environment having roots in early personalized learning concepts and contemporary SW-based learning environments [10].
- ▶ PLE offers inquiry-based, time-sensitive, and social learning experiences [11].
- ▶ Like other SW based environments, learners find relevant information in PLE through its recommender feature [12].
- ▶ PLE concept recognizes the interactive, open access, ease of use, and entity-based connection features of the SW. These features are based on inquiry, collaboration, user-centered design and personalization principles of learning [14,15].

The gPLEs Model

- ▶ The gPLEs model is particularly suited for describing the design of PLEs [8].
- ▶ It supports users in ways as their parents / teachers / personal advisors / MKOs have been supporting them [15,16].
- ▶ Our model employs three-step-based PLE design and development logic:
 - ▶ identifying PLE-based learning skills of users
 - ▶ devising recommender logic based on user skills
 - ▶ developing a PLE to evaluate recommender results
- ▶ The model semantically analyses teacher skills [11] and learner preferences and generates recommendations which are based on the results of that analysis.



Social and Learning Theories and Pedagogical Models Underpinning the gPLEs Model

- ▶ We benchmark gPLEs model's features with major social and learning theories and pedagogical models.
- ▶ Traditional as well as contemporary teacher-centric and student-centric social and learning theories have been discussed.
- ▶ For proof of concept, we have developed [GuidedLearn](#), a PLE that is developed on PLE design principles of the gPLEs model, and [SkillRec](#) [5], the recommendation engine of the GuidedLearn.
- ▶ SkillRec performs semantic analysis of user interests and teacher roles to develop user skills [5].

Objectivism

- ▶ Objectivism holds that human knowledge and standards are objective [17]. It assumes that knowledge can be transferred from teachers and acquired by students [18].
- ▶ Objectivist learning conceptions include analysis, representation, and re-sequencing of instructional content and tasks in order to make them more predictably and reliably transmissible [17,19].
- ▶ The gPLEs model sees PLE as a manipulable, customizable, and productivity-increasing learning environment that fosters virtues of identity, productivity, autonomy, and self-regulation in its users [8].
- ▶ Deriving insight from teachers' "Planning and Design" competence [11], the gPLEs model provides users with user-skills based recommendations in ranked order [5].



Instructivism

- ▶ Instructivist learning theory refers to direct instruction employing curriculum-related objectives and lesson plans [20].
- ▶ Direct instruction demands content to be sharply defined and learning strategies to be focused as directly on pre-specified content as possible [22].
- ▶ Leveraging on teachers' "Planning and Design" competence [11], the gPLEs model provides accurate, semantic-rich recommendations to users on a scale of five ranks [5].
- ▶ The recommender strategy is carefully designed and is based on clear objectives.

Behaviorism

- ▶ Behaviorism holds that all behaviors are acquired through conditioning criteria [23]. Behaviorism assumes that individuals start off as a clean slate.
- ▶ It is primarily concerned with observable behavior as opposed to internal events like thinking.
- ▶ Learning from “Communication and Interaction” competence [11], the gPLEs model copies observable behavior in users’ cognition through conditioning criteria.
- ▶ It obtains conditioning information about user needs through user profiles over SW [5].
- ▶ Behavioral performance and retention power of users increases when they explore users recommended to them through SkillRec.



Cognitivism

- ▶ Cognitivism defines learning as a process of creating and evaluating information by involving reasoning, clear objectives, and problem solving techniques [24].
- ▶ Cognitivists argue that the black box (i.e., mind) needs to be opened and understood.
- ▶ Shaping PLEs requires users to encode, store, and retrieve information, apply visuals to artifacts and use tools, widgets and applications to carry out tasks related to their learning [6].
- ▶ GuidedLearn provides user recommendations in proper shape (block or page), format (tabular or scrolling), order (sorted or ranked), place (left side or right side), and context (instantly based on user interests).



Humanism

- ▶ Humanism views learning as a personal act to fulfill one's potential. The ultimate goal of Humanism is to develop self-actualized people in a cooperative and supportive environment [27]. Central tenet of humanism is that people act with intentionality and values [28].
- ▶ The gPLEs model sows in learners the seeds of freedom, smartly working, interdependence, and mutual respect.
- ▶ Learning from teachers' "Management and Administration" competence [11], the gPLEs model invites learners to explore objects on their own, and to learn from each other's experiences and skills.



Constructivism

- ▶ Constructivism looks on ways how individuals learn [17]. Constructivists (Shuck [29] and Papert [30]), believe that acquisition of knowledge is not sufficient to education. They view learner a person who acts on objects and events within its environment and in a process gains understanding and derive meaning from those objects / events.
- ▶ Shaping, crowding, and organizing resources in a PLE provides learners opportunity to reconstruct their knowledge about people, world objects, and events [8].
- ▶ GuidedLearn offers learners to interact with their learning environments in better way. It supports knowledge construction activities through recommendations, user-centered design, and SW-based plugin support features [5].

Connectivism or Networked Learning

- ▶ Connectivism or Networked Learning holds that learning and knowledge rests in diversity of opinions, and that connections which enable learners to learn more are more important than learners' current state of knowing [31].
- ▶ The gPLEs model envisions a PLE where people / communities, objects / events, tools / resources, and learner / learning interact easily and flexibly.
- ▶ Exploiting teachers' "Communication and Interaction" competence [11], GuidedLearn offers learners to connect with other people and information resources to get their knowledge, skills, and experiences updated [8].

Constructionism

- ▶ Constructionism is a “trial and error” method known as “learning by doing” or “learning by making” that recognizes artifact development of learners [14].
- ▶ Shaping a learning environment, devising strategies to real life solve problems, coding / programming, simulating a process are examples of Constructionism.
- ▶ The gPLEs model extends constructionism by assuming that learning occurs while learners build learning environments.
- ▶ GuidedLearn provides learners with required tools to construct and customize learning environment [5].
- ▶ Such experiential learning activity enables learners to develop, refine, and reconstruct their views about world objects [30].



Andragogy

- ▶ Andragogy philosophy (teaching adults to learn) holds that adults are self-directed learners. They are capable enough to take responsibility for their learning and achievements.
- ▶ GuidedLearn performs two roles during a learning process: the role of teacher and the role of learning environment [8].
- ▶ At one side, it guides individuals to their learning path through SkillRec [5] and at the other side, it lets them know preferences of their friends through providing them access to their timeline posts /photos.

Personalized Learning

- ▶ Personalized learning holds that learner is active co-designer of its learning path [33]. It offers tailoring of pedagogy, curriculum, and learning environment in accordance with learner needs [9].
- ▶ The gPLEs model triggers support in learner environments without affecting their core “personalization” construct [8].
- ▶ GuidedLearn enables individuals to design an environment they dream of, develop their learning strategy and follow it, and connect with people and resources which are consistent with their needs.
- ▶ SkillRec recommendations are personalized on learner preferences [5].

Discovery or Inquiry-based Learning

- ▶ Discovery learning engages learners in knowledge construction activity through the inquiry process [34]. Pedagogical aims of discovery learning are threefold: (1) to promote deep learning; (2) to promote meta-cognitive skills; and (3) to promote learner engagement
- ▶ Leveraging teachers' "Communication and Interaction" competence [11], the gPLEs model inculcates discovery and inquiry-based learning qualities in learners.
- ▶ GuidedLearn helps learners to (1) keep their environments up to date (promotes learner engagement); (2) keep exploring new opportunities (promote meta-cognition); (3) reflect to recommendations if they find them interesting (promotes deep learning).

Situated Learning

- ▶ Situated Learning holds that knowledge is contextually situated and fundamentally influenced by activity, context, and culture in which it is used [35]. PLE building activity is a real world example of situated learning [4].
- ▶ The gPLEs model allows learners to replicate their real world activities in their online PLEs.
- ▶ Getting insight from teachers' "Management and Administration" competence [11], the gPLEs model provides learners with feedback and technical assistance as and when needed [8].
- ▶ Its recommendation strategy is based on "one work at one time" principle. SkillRec sends recommendations to the active learner with five seconds intervals, which allows and develops "one work at one time" habit among individuals.



Authentic Learning

- ▶ Authentic learning provides learners with authentic learning contexts to reflect the way knowledge is used in real life situations [36].
- ▶ In GuidedLearn, the gPLEs model provides authentic real life, collaborative effort, and inquiry-based problem solving contexts to the learners that reflect the way individuals use knowledge in real life situations.
- ▶ Adding to that, SkillRec inculcates in learners teachers' scaffolding, reflection, articulation, and assessment-based support through recommendations.



Findings

- ▶ The gPLEs model fosters meaningful learning competencies in learners which allow them to define their learning goals, design useful models, conserve with people and resources and participate in knowledge construction practices.
- ▶ It inculcates in learners teacher-centered and learner-centered competencies.
- ▶ Teacher-centric skills include: intuition, reflection, productiveness, brain reasoning, conceptualizing, etc.
- ▶ Learner-centric skills include: knowledge construction, articulation, conversation, self-regulation, collaboration, interdependence, balance of power, etc.





Contributions

- ▶ This work contributes to the body of knowledge on PLEs and e-learning environments in, at least, three ways.
 - ▶ Firstly, explanation of the features of the gPLEs model provides sufficient evidences for the need of teacher-based guidance element in online learning environments.
 - ▶ Secondly, it lays to a greater understanding of whether and how relevant social and learning theories support the gPLEs model.
 - ▶ Last but not least, benchmarking gPLEs model's features against relevant theories sets theory verification standard for researches in the PLE field.



Conclusions

- ▶ The gPLEs model adds a novel yet authentic teacher competences-based guidance mechanism in the PLE concept.
- ▶ We discussed traditional and contemporary social and learning theories underpinning the gPLEs model. The aim was to prove that
 - ▶ The gPLEs model has roots in major learning theories and pedagogical models, and
 - ▶ The gPLEs model inculcates in learners essential learning skills which are paramount for learning in the 21st Century phenomena.
- ▶ This work has implications for teaching and learning practices across all educational levels and learning types, as it insights on how teaching and learning experiences in the 21st Century can be enriched with emerging social web and learning technologies.



Thanks



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