UNI-Tel

RESEARCH REVIEW ON CONCEPTIONS OF LEARNING AND TEACHING

Table 1 Thematic grouping of research on conceptions of learning and teaching

Author	Perspective	Contribution	Relevance
Tynjälä, P., Häkkinen, P., Hämäläinen, R. (2014)	Work-based learning: examining TEL at work in the context of the integrative pedagogy model, studying how to create learning environments whereby the four basic elements of professional expertise (ie, theoretical, practical, self-regulative and sociocultural knowledge can be integrated	Provides a framework for designing and applying technologies for work-place learning, contributing particularly on integration of theoretical and practical knowledge.	Integrative Pedagogy model can help take-into-use of existing social media tools to learning process by organizing learning activities and mediating tools. Use of 3D environments, such as virtual laboratories, can serve as mediating tools that intercommunicate between different forms of knowledge and offer added value for professional development, integrating different forms of expertise knowledge
Ge, X., Law, V., Huang K. (2016)	Problem-based learning: to clarify interrelationships between self-regulation and problem solving of ill-structured problems	Proposes a conceptual framework illustrating the iterative processes among problem-solving stages (i.e., problem representation and solution generation) and self-regulation phases (i.e., planning, execution, and reflection).	In solving an ill-structured problem, problem solvers have to iteratively achieve two goals: defining the problem and finding a solution. To support self-regulation, it is necessary to provide contextualized scaffolds for particular problem-solving stages.
Bower, M., &	Technology-	Offers a comparison	Provides an analytic

Vlachopoulos, P. (2018).	enhanced learning: comparing different technology-enhanced learning design models, to provide a systematic analysis and summary of the research literature in order to assist educators to create technology-enhanced learning experiences, or to analyze their differences.	of 21 design models for technology-enhanced learning models	framework and explicit criteria with which to select and evaluate technology-enhanced learning design models.
Loughlin, C. (2017)	Technology-enhanced learning: studies academics' perceptions of, and attitudes to, educational technologies, and examines the context of the intrinsic and extrinsic barriers to adoption of TEL in higher education	Brings into discussion the need for institutional strategies, policies and practices development, and establishment of support function for academics in their efforts to take TEL into use.	Highlights the importance to pay attention to both intrinsic and extrinsic factors in slow adoption of TEL in institutional level, and to include the element of change management in the pedagogical training

RECOMMENDATIONS FOR PROJECT

Tynjälä et. al. (2014)
- We need new ways of empowering professional development; particularly, to find better ways of enhancing workers' abilities to apply and integrate theoretical, practical and self-regulative knowledge in problem solving.
- Problem solving is the core process in the development of expertise.
- When it is not possible to rehearse the practical and sociocultural knowledge components in an authentic work context, virtual exercises, such as use of virtual laboratories, should be used.

- Through a problem-solving process, workers' actions are tied together to enhance the skills needed in the interprofessional workplace (cf. problem solving)

Ge et. al. (2016)
- Researchers consolidated the previous ill-structured problem-solving models into four main processes: (1) problem representation, (2) generating solutions, (3) constructing arguments, and (4) monitoring and evaluation. Students need to learn to go between the stages and adapt their working to develop self-regulation.
- It is important to provide scaffolding to specific self-regulation activities in each of the ill-structured problem-solving stages. For instance, planning during problem representation includes activating prior knowledge, understanding tasks, and formulating goals, while planning during solution generation involves strategic planning and identifying resources.

Bower, M., & Vlachopoulos, P. (2018).
- Comparative study of pedagogical design models for technology-enhanced learning are often not constructed or reported in any consistent or comprehensive way. This makes it difficult for educators to contrast, select, adopt and integrate models in their teaching practice.
- In order for teachers to make informed decisions when choosing a learning design framework or model, several criteria can be applied to evaluate the model: e.g. conceptual versus procedural, pedagogical underpinnings, granularity, contextuality, student-teacher interactivity, technology guidance and evaluation.

Loughlin, C. (2017).
- Instructional designers and support is needed for academic staff to take TEL into use at large. One of factors explaining slow use of TEL is the lack of institutional support: academics expect institutional strategies, policies and practices to guide the take-into-use of TEL.
- In the personal level, reasons for slowly adoption of TEL are e.g. 'lack of time', 'lack of equipment' and a 'lack of skills', speaking for need to integrate the topic of change into the WP2 pedagogical training - the roles and tasks of academic staff and instructional designers need to be considered, and this constitutes a change for the existing structures.

DATA ACQUISITION FOR THE STATE OF THE ART

Semi-structured Interviews

Topic area: theory and practice
1. University studies should teach students and graduates both theory and practice, conceptual understanding and practical action. What pedagogical practices do you use for **application of theory to practice**?
2. In your opinion, what are the challenges and opportunities in technology-enhanced learning for teaching theory and practice?

Self-regulation and motivation

3. In university education, user-orientation or student-orientation has gained popularity. Who is in charge of **learning process** in higher education? Please describe the roles of a teacher and student in your university/institution.
4. In your opinion, are students self-regulated learners?

Topic area: knowledge, skills and attitudes

5. University studies can enable students to learn both domain-specific knowledge and generic skills or transferable skills. What pedagogical practices do you use for learning and teaching of **soft skills**, e.g. team work, time management, communication, negotiation, conflict resolution?
6. University teaching should facilitate both individual and social learning. What pedagogical practices do you use for **collaborative learning**, such as sharing ideas, problem-solving or knowledge co-construction in groups?
7. In your opinion, what are the challenges and opportunities in technology-enhanced learning for **collaborative learning**?
8. Problem-based learning (and students solving working-life relevant problems) is a common practice in university teaching and learning. Describe the roles of teacher and students in **problem-based learning** in your university/teaching?
9. In your opinion, what are the challenges and opportunities in problem-based learning in an online learning environment?

Topic area: working-life orientation

10. University studies often include work practice periods or projects in industry settings. What pedagogical practices are used for **facilitating learning at the workplace**? How students are supported to make use of learning opportunities at the workplace?
11. Describe the current forms of **university-business collaboration** in use at the university? (This may include e.g. visiting speakers, visits to companies, internships, job-shadowing etc.) Are these obligatory of voluntary parts of teaching and learning?
12. What pedagogies are used to increase student understanding and exploration of the current needs of the industry? Describe the current methods for **active and participatory learnin**g at the moment.
13. In your opinion, what challenges your institution or environment places for use of new pedagogies, and use of technology-enhanced learning?
14. In your opinion, are students ready for technology-enhanced learning? Please reflect your experiences of their studying online.

Topic area: pedagogy for technology-enhanced learning and culture of teaching

15. How do you select pedagogies in use for technology-enhanced learning? Do you transfer pedagogies from classroom teaching to the internet-based learning environment or do you plan specific pedagogical practice to be used?

16. What kind of support would you need from a person dedicated to design of technology-enhanced learning, if you were in the position of delivering a course online?
17. What is the role of **collegial support and sharing** in your department: Do you get help from your peers? What kind of structures there are for cooperation? Are there some elements which are hindering peer-support and cooperation?

Topics for interviewing companies

18. What kind of collaboration your company has with the university sector (joint lectures, job placement, training, project work, etc.)?
19. Is there anything preventing your company from university collaboration?
20. What kind of collaboration with the university would help you the most?
21. Any suggestions for digital learning collaboration with universities?

LITERATURE

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