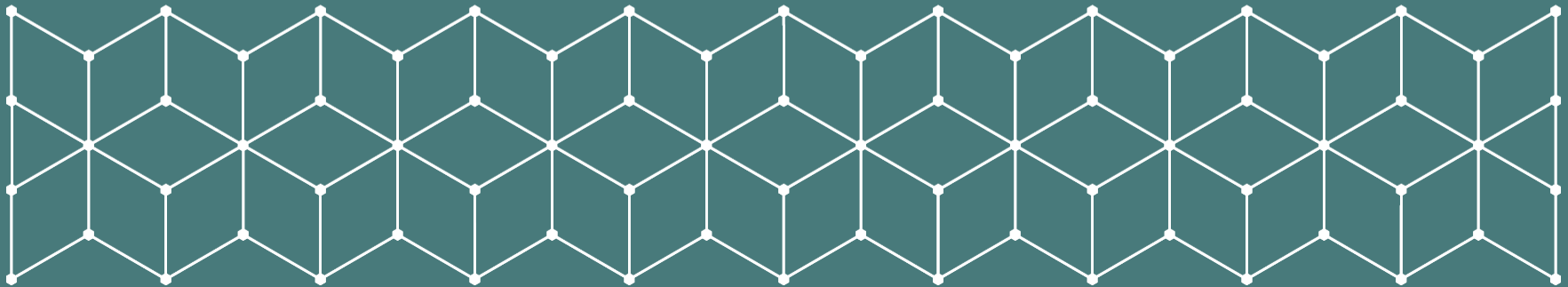


‘Learning to Learn’ in Digital Environments: Design principles informed by Galperin’s concepts of orientation



Plan

- Introduction
- ‘Learning to learn’ in previous research
- Galperin’s cultural-historical approach to ‘learning to learn’
 - Learning as an orienting activity
 - The dialectics of learning and teaching
- Design principles informed by Galperin’s concepts of orientation
- Conclusion

Introduction

“One of the core functions of 21st century education is learning to learn in preparation for a lifetime of change”

(Miliband, 2003, presented at North of England Conference)

21st century Competencies



‘Learning to Learn’ in Previous Research

- Metacognition (Pintrich, 2002; Schraw, et al., 2006);
- Self-regulated learning (Winne, 1997; Winne & Perry, 2000);
- Operationalisation through classroom instruction (Baird & White, 1996; Beeth, 1998; Gunstone & Mitchell, 1998; Mason, 1994);
- Science education: six strategic areas (Schraw, et al., 2006);
- Language learning: assessment for learning (AfL) (William, 2006);
- Strategies across subject areas (Zimmerman, 2002, 2008);
- Higher mental functions (Vygotsky, 1978);
- Learning and teaching and mental development (Galperin, 2002).

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Full length article

Learning for the future: Insights arising from the contributions of Piotr Galperin to the cultural-historical theory

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Historical Background

- Contemporary of Vygotsky
- Completed his education in 1921-26 as a psycho-neurologist in Kharkov (Ukraine)
- In 1932 was offered a position in Ukrainian Psycho-Neurological Academy
- The beginning of 1930s-life threatening atmosphere in Moscow and in 1932 Leontiev, Luria, Lebedinsky, Bozjovich and others moved to Kharkov where they met Galperin
- Vygotsky kept close contact with Kharkov group during his often visits there

The Contribution of Galperin

- i. Specifying the unique character of human mental development emerging in social and cultural, tool-mediated practices;
- ii. Conceptualising the nature and functions of human psychological processes as specific forms of activity, by outlining its structure and identifying the subject of psychology in studying of object-oriented activity in its ontogenesis;
- iii. Identifying the role and the function of tools as imbued with relevant social experience and mediating learning activity.

Types of Orientation

- I. *Incomplete orientation*: mediational tools and the essential characteristics of the target concept are identified by learners through trial and error.
- II. *Complete orientation*: learners are informed about all the essential characteristics of the target concept and the mediational tools.
- III. *Complete, but constructed by learners following an offered approach*: created in collaboration with the teacher and is aimed at identifying the essential characteristics of the target concept and useful mediational tools.

Third Type of Orientation

- Reveals the essence of learning and promotes theoretical abstract thinking;
- Offers a unified approach to learning and forms the basis for creating links between sciences, subject areas and approaches to studying them;
- Learners master the *essence of learning* through studying a phenomenon which carries a new function: not as a studied *object*, but as a *tool* for studying how to go about learning.

Dialectics of Learning and Teaching

Forms of learning activity – dialectical transformation from the social external to the internal plane:

1. Motivation;
2. Orientation;
3. Materialised action – interaction with material or materialised objects;
4. Communicated thinking – speech as the main guiding tool that reflects learners' activity with material or materialised objects;
5. Dialogical thinking – a dialogue of a learner with him/herself (as another person);
6. Acting mentally – mental act with a focus on the outcome.

Research on Design Principles of Digital Environments

- Design principles emerge from previous research and inform future design activities (Bell, Hoadley, & Linn, 2004)
- Design principles provide a bridge between theories of learning and practice of learning (Paavola et al., 2011)
- The origin of design principles can be either theoretically, empirically or practically informed (Hewitt & Scardamalia, 1998; Kaptelinin & Nardi, 2006; Paavola et al., 2011)

Design Principles Informed by Galperin's Concepts of Orientation

First, when designing a digital environment it seems important to:

- i) identify the target concept students need to develop their understanding about and
- ii) the essential features or structural parts of the target concept.

The sequence of presenting the essential features of the target concept to learners should be identified taking into consideration students' prior knowledge and skills.

Design Principles Informed by Galperin's Concepts of Orientation

Second, if a learning activity is to adequately assist the development of learners' understanding of the essential features of the concept it might be organised according to the **third type of orientation**: complete but created by students by using an offered approach.

The overview of the whole activity - '*operational scheme of thinking*' might be integrated in digital environments to facilitate students' understanding of an approach to learning they are to pursue.

Design Principles Informed by Galperin's Concepts of Orientation

Third, some of the resources to assist learners in the development of their understanding of the essential features of the target concept may be presented in *materialised* form.

Fourth, *social interactions* of learners in the form of group discussions facilitated by the teacher should be integrated in the learning process. These social interactions may establish premises for students' knowledge co-creation and contribute to learners' understanding of the target concept.

Design Principles Informed by Galperin's Concepts of Orientation

Finally, the role of the feedback and teacher's facilitating of the learning process need to be accounted for in the design: the feedback provided to learners by digital tools or a teacher might assist students both in *identifying the essential characteristics of the target concept* and as *an approach to learning* to enhance students' understanding about what learning makes.

Design Principles Informed by Galperin's Concepts of Orientation

1. Identify the target concept, its essential features and the sequence in which these features may be presented to learners;
2. Organise the learning activity according to the third type of orientation and present the 'overview' of the activity (operational scheme of thinking);
3. Present some of the resources in the materialised form;
4. Intergrade social interactions of learners and the teacher;
5. The feedback provided should assist learners in identifying the essential features of the target concept and facilitate their understanding about what learning makes.

Conclusion

- The suggested design principles are tentative and might be examined in further research.
- Galperin's elaborations of the executive and control parts of the learning activity might provide useful additions to the suggested design principles.
- Galperin's study of orientation might offer valuable insights to inform new approaches for design of digital environments aimed to enhance learning and the development of students as learners in the 21st century.

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References

- Baird, J., & White, R. (1996). Metacognitive strategies in the classroom. *Improving teaching and learning in science and mathematics*, 190-200.
- Beeth, M. E. (1998). Teaching for conceptual change: Using status as a metacognitive tool. *Science Education*, 82(3), 343-356.
- Bell, P., Hoadley, C. M., & Linn, M. C. (2004). Design-based research in education. *Internet environments for science education, 2004*, 73-85.
- Black, P., Harrison, C., & Lee, C. (2003). *Assessment for learning: Putting it into practice*: McGraw-Hill Education (UK).
- Black, P., McCormick, R., James, M., & Pedder, D. (2006). Learning how to learn and assessment for learning: A theoretical inquiry. *Research Papers in Education*, 21(02), 119-132.
- Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in education*, 5(1), 7-74.
- Bødker, S. (1991). Through the interface-A human activity approach to user interface design. *DAIMI Report Series*, 16(224).
- Carroll, J. M. (1991). *Designing interaction: Psychology at the human-computer interface* (Vol. 4): CUP Archive.
- Carroll, J. M. (1997). Human-computer interaction: psychology as a science of design. *Annual review of psychology*, 48(1), 61-83.
- Claxton, G. (2007). Expanding young people's capacity to learn. *British Journal of Educational Studies*, 55(2), 115-134.
- Claxton, G. (2013). *What's the point of school?: Rediscovering the heart of education*: Oneworld Publications.
- Clymer, J. B., & Wiliam, D. (2007). Improving the way we grade science. *Educational Leadership*, 64, 19.
- Dourish, P., & Bly, S. (1992). *Portholes: Supporting awareness in a distributed work group*. Paper presented at the Proceedings of the SIGCHI conference on Human factors in computing systems.
- Fischer, G., Lemke, A. C., Mastaglio, T., & Morch, A. I. (1991). The role of critiquing in cooperative problem solving. *ACM Transactions on Information Systems (TOIS)*, 9(2), 123-151.
- Fjeld, M., Morf, M., & Krueger, H. (2004). Activity theory and the practice of design: evaluation of a collaborative tangible user interface. *International Journal of Human Resources Development and Management*, 4(1), 94-116.
- Galperin, P. Ya. (2002). *Lekcii po psikhologii [Lectures in psychology]*: Moscow: Knizhnyy Dom Universitet
- Gibson, J. J. (1977). The theory of affordances. In "Perceiving, Acting and Knowing", Eds. RE Shaw and J. Bransford. In: Erlbaum.
- Hedestig, U., & Kaptelinin, V. (2002). *Re-contextualization of teaching and learning in videoconference-based environments: An empirical study*. Paper presented at the Proceedings of the Conference on Computer Support for Collaborative Learning: Foundations for a CSCL Community.
- Hegel, G. W. F. (1995). *Lectures on the History of Philosophy: Greek philosophy to Plato* (Vol. 1): U of Nebraska Press.
- Hewitt, J., & Scardamalia, M. (1998). Design principles for distributed knowledge building processes. *Educational Psychology Review*, 10(1), 75-96.
- James, M., & McCormick, R. (2009). Teachers learning how to learn. *Teaching and Teacher education*, 25(7), 973-982.
- James, M., McCormick, R., Black, P., Carmichael, P., Drummond, M.-J., Fox, A., . . . Procter, R. (2007). *Improving learning how to learn: Classrooms, schools and networks*: Routledge.
- Jonassen, D. H., & Rohrer-Murphy, L. (1999). Activity theory as a framework for designing constructivist learning environments. *Educational technology research and development*, 47(1), 61-79.
- Kali, Y. (2006). Collaborative knowledge building using the Design Principles Database. *International Journal of Computer-Supported Collaborative Learning*, 1(2), 187-201.
- Kaptelinin, V. (1996). Activity theory: Implications for human-computer interaction. *Context and consciousness: Activity theory and human-computer interaction*, 1, 103-116.
- Kaptelinin, V., & Nardi, B. A. (2006). *Acting with technology: Activity theory and interaction design*: MIT press.
- Leontiev, A. N. (2005). Study of the environment in the pedagogical works of LS Vygotsky: a critical study. *Journal of Russian & East European Psychology*, 43(4), 8-28.
- Macaulay, C., Benyon, D., & Crerar, A. (2000). Ethnography, theory and systems design: From intuition to insight. *International Journal of Human-Computer Studies*, 53(1), 35-60.
- Mason, L. (1994). Cognitive and metacognitive aspects in conceptual change by analogy. *Instructional Science*, 22(3), 157-187.

References

- Mørch, A., Cheung, W., Wong, K., Liu, J., Lee, C., Lam, M., & Tang, J. (2005). Grounding collaborative knowledge building in semantics-based critiquing. In *Advances in Web-Based Learning-ICWL 2005* (pp. 244-255): Springer.
- Mørch, A. I. (2011). Externalized Design: Expressing Social Ideas in Software. In *Knowledge Development and Social Change through Technology: Emerging Studies* (pp. 64-84): IGI Global.
- Nardi, B. A. (1996). *Context and consciousness: activity theory and human-computer interaction*: Mit Press.
- Nardi, B. A., Miller, J. R., & Wright, D. J. (1998). Collaborative, programmable intelligent agents. *Communications of the ACM*, 41(3), 96-104.
- Norman, D. (1988). The design of everyday things (originally published: The psychology of everyday things). *The Design of Everyday Things (Originally published: The psychology of everyday things)*, 20.
- Norman, D. A. (1991). Cognitive artifacts. *Designing interaction: Psychology at the human-computer interface*, 1, 17-38.
- Paavola, S., Lakkala, M., Muukkonen, H., Kosonen, K., & Karlgren, K. (2011). The roles and uses of design principles in a project on dialogical learning. *Research in Learning Technology*.
- Pintrich, P. R. (2002). The role of metacognitive knowledge in learning, teaching, and assessing. *Theory into Practice*, 41(4), 219-225.
- Polanyi, M. (2009). *The tacit dimension*: University of Chicago press.
- Schraw, G., Crippen, K. J., & Hartley, K. (2006). Promoting self-regulation in science education: Metacognition as part of a broader perspective on learning. *Research in Science Education*, 36(1-2), 111-139.
- Selwyn, N. (2011). *Education and technology: Key issues and debates*: A&C Black.
- Smith, K., Gamlem, S. M., Sandal, A. K., Engelsen, K. S., & Tong, K.-w. (2016). Educating for the future: A conceptual framework of responsive pedagogy. *Cogent Education*, 3(1), 1227021. doi:10.1080/2331186X.2016.1227021
- Stahl, G. (2006). Group Cognition: Computer Support for Building Collaborative Knowledge (Acting with Technology).
- Stetsenko, A., & Arievitch, I. (2002). Teaching, learning, and development: A post-Vygotskian perspective. *Learning for life in the 21st century: Sociocultural perspectives on the future of education*, 84-96.
- Vygotsky, L. (1978). Interaction between learning and development. *Readings on the development of children*, 23(3), 34-41.
- Vygotsky, L. (1980). *Mind in society: The development of higher psychological processes*: Harvard university press.
- Vygotsky, L. (1986). Thought and language. In: Cambridge, Ma: MIT Press.
- Wertsch, J. V. (1991). *Voices of the mind*: Harvard University Press.
- William, D. (2006). Formative assessment: Getting the focus right. *Educational Assessment*, 11(3-4), 283-289.
- Winne, P. H. (1997). Experimenting to bootstrap self-regulated learning. *Journal of educational Psychology*, 89(3), 397.
- Winne, P. H., & Perry, N. E. (2000). Measuring self-regulated learning.
- Wirth, K. R., & Perkins, D. (2008). Learning to learn. *Recuperado de <http://www.macalester.edu/geology/wirth/CourseMaterials.html>*.
- Wood, D., Bruner, J. S., & Ross, G. (1976). The role of tutoring in problem solving. *Journal of child psychology and psychiatry*, 17(2), 89-100.
- Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory into Practice*, 41(2), 64-70.
- Zimmerman, B. J. (2008). Investigating self-regulation and motivation: Historical background, methodological developments, and future prospects. *American educational research journal*, 45(1), 166-183.

