

Integrative Pedagogy and E-learning

Päivi Tynjälä and Anne Virtanen

ICA-EDU Colloquim, 16.6.2016



UNIVERSITY OF JYVÄSKYLÄ
FINNISH INSTITUTE FOR
EDUCATIONAL RESEARCH



Major global challenges

2

Networking

Globalisation

Urbanization

Increasing amount
of information

Continuing change

Complicated structures

Innovations

Climate change

Ageing of population

Boundaryless work

Fast development

Digitalization

Robotization

Technological development



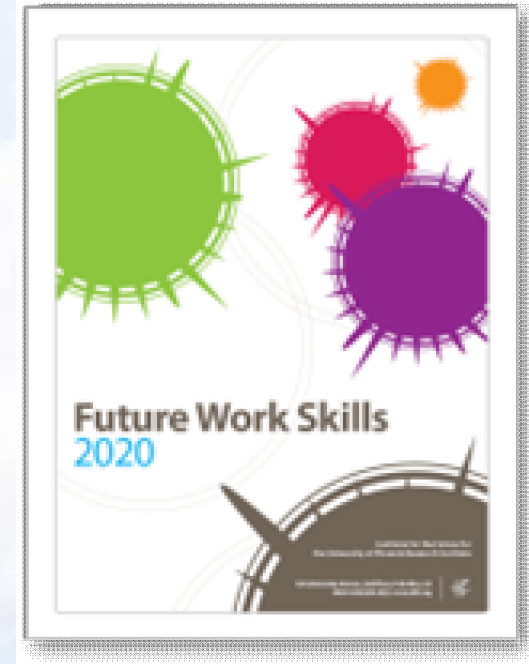
<http://herbu1.files.wordpress.com/2009/06/future-thinking.jpg>



Ten skills for the future workforce

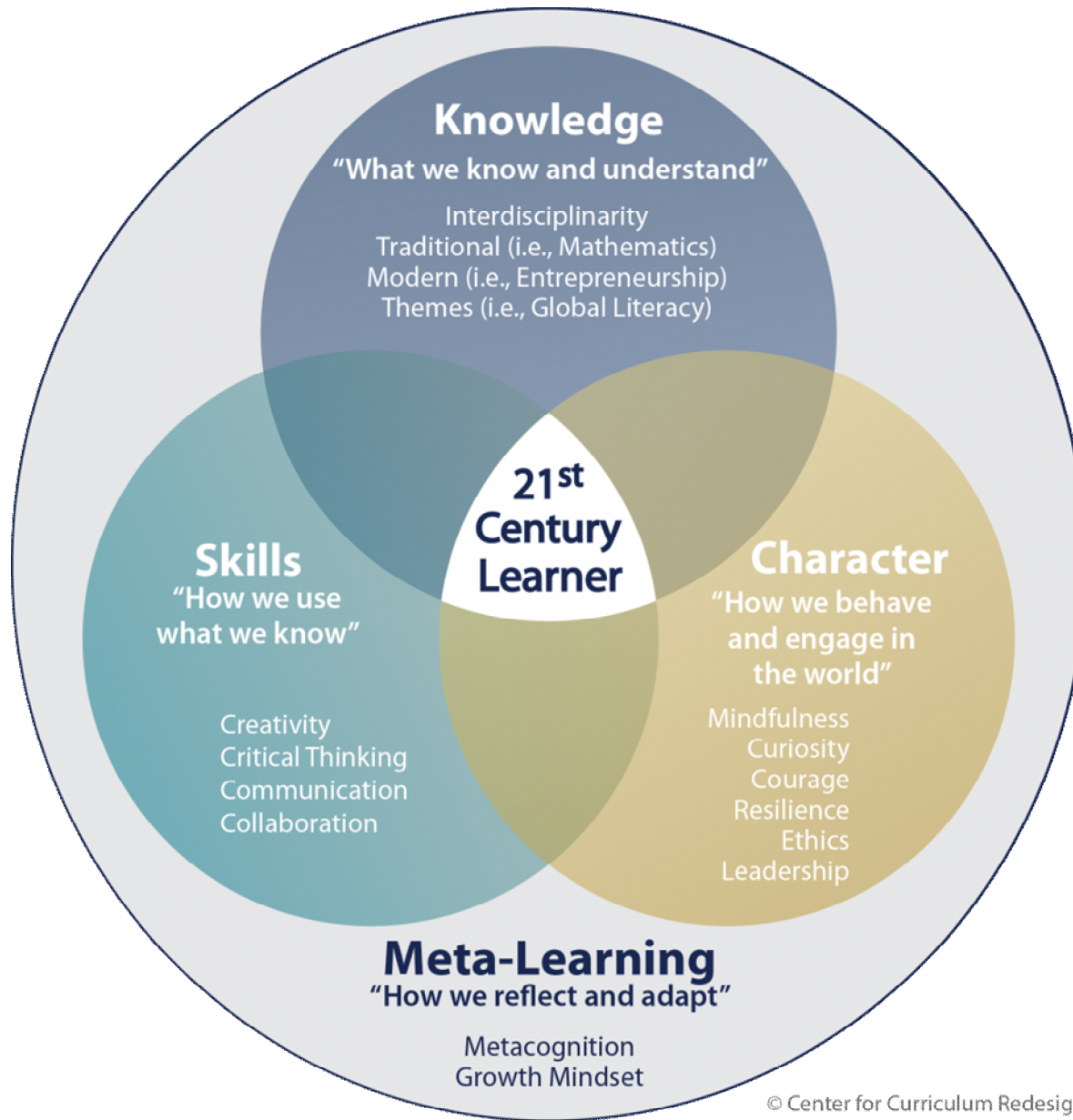
(Future Work Skills 2020, Institute for the Future for the University of Phoenix Research Institute)

1. Sense-making
2. Social intelligence
3. Novel and adaptive thinking
4. Computational thinking
5. Cross-cultural competency
6. New-media literacy
7. Transdisciplinarity
8. Design mindset
9. Cognitive load management
10. Virtual collaboration



- Skills perspective too narrow





Four-Dimensional Education: The Competencies Learners Need to Succeed,
 Copyright © 2015 by Center for Curriculum Redesign

How can we meet these challenges in education?

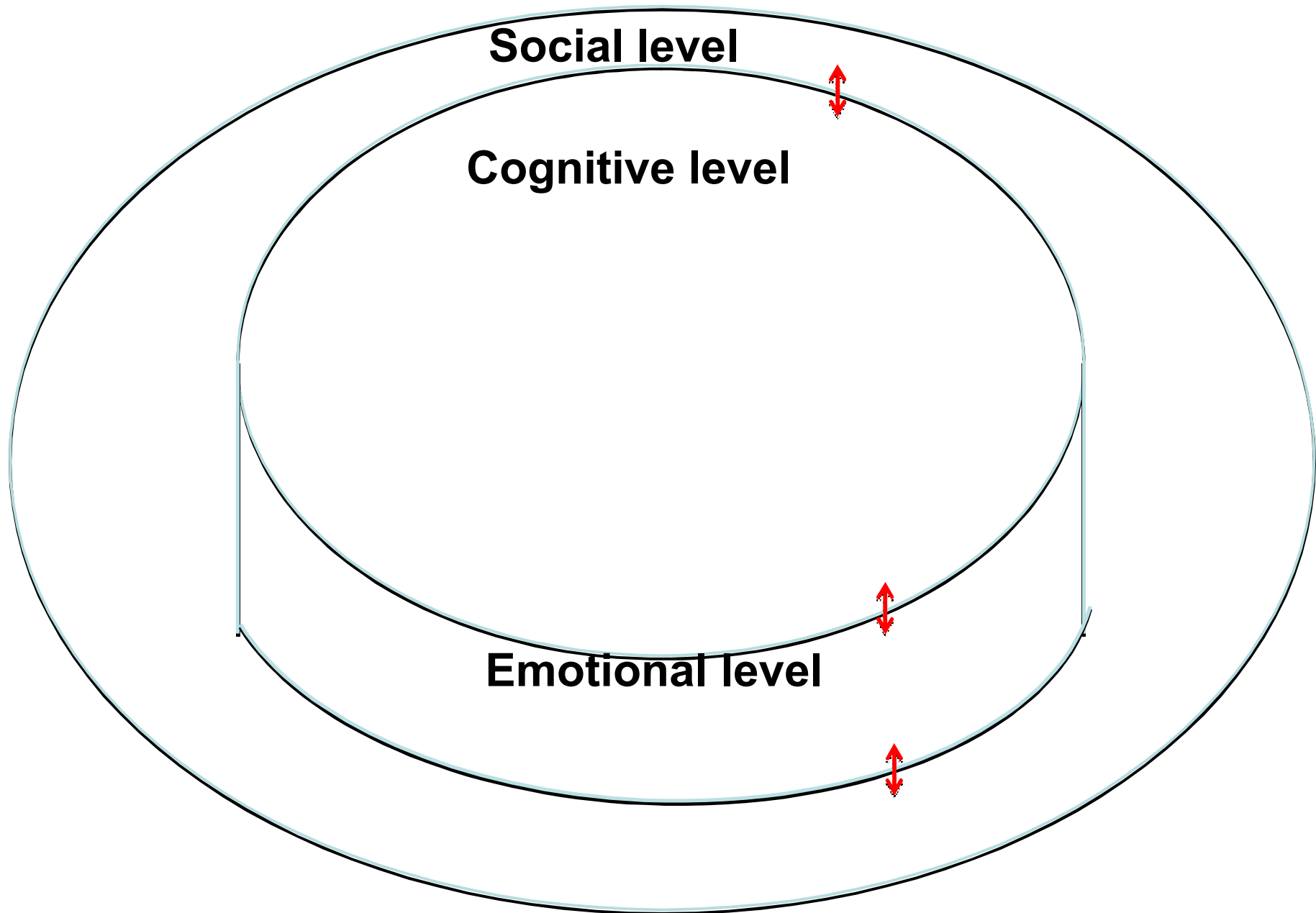
We need a holistic view on learning and the development of skills, knowledge, attitudes, competences, expertise, character ...and wisdom



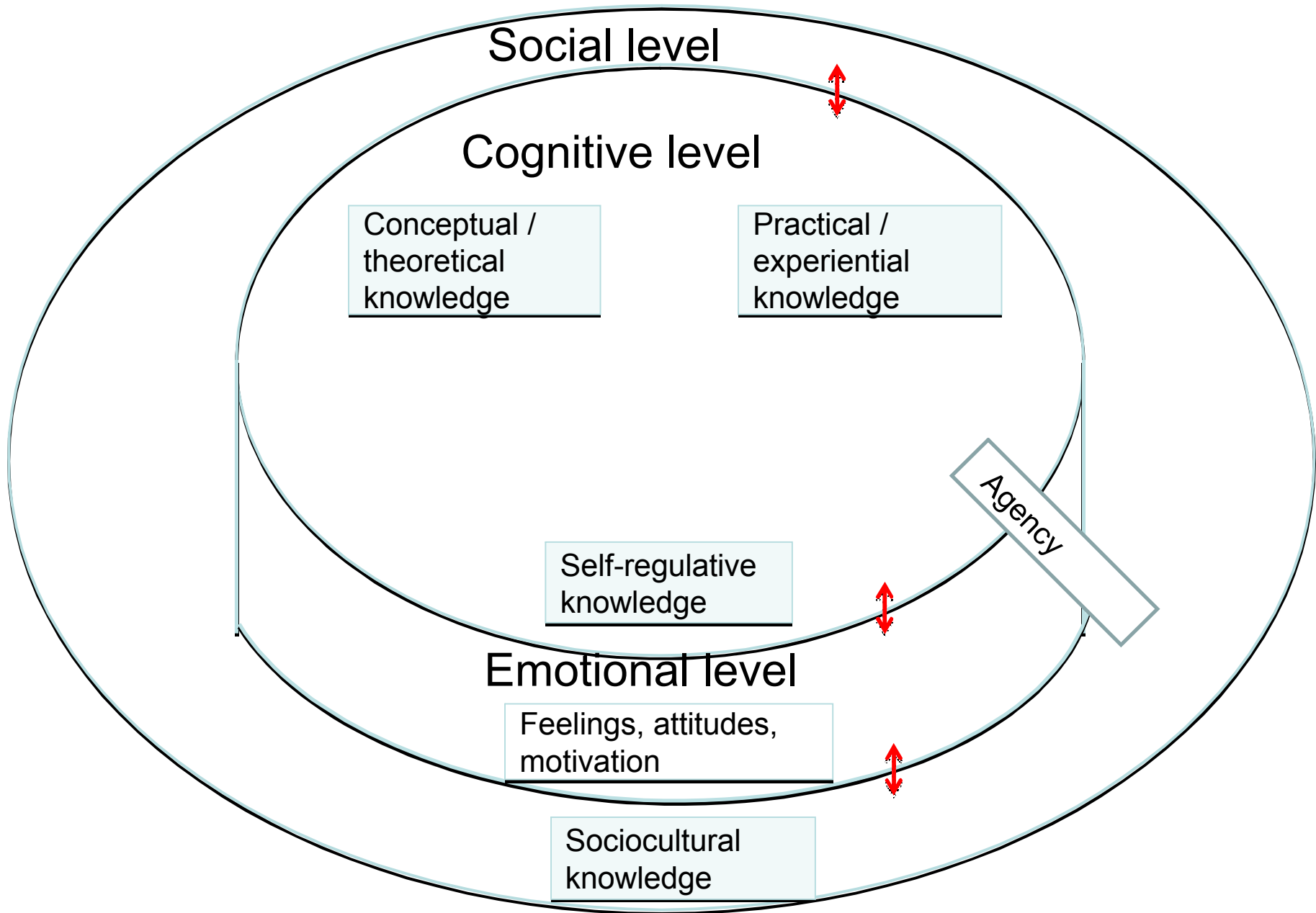
The model of Integrative Pedagogy as one suggestion



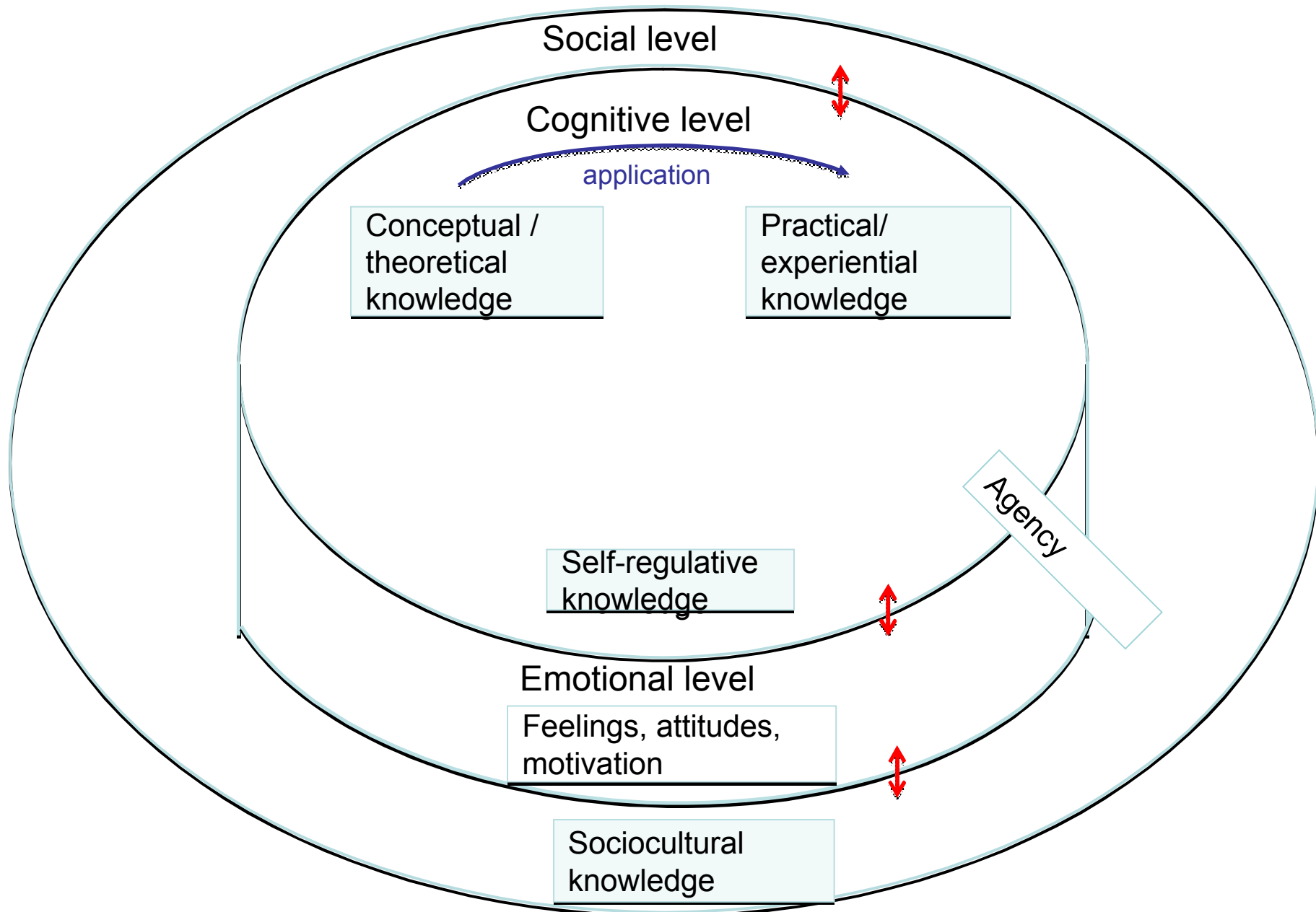
Levels of human psychology



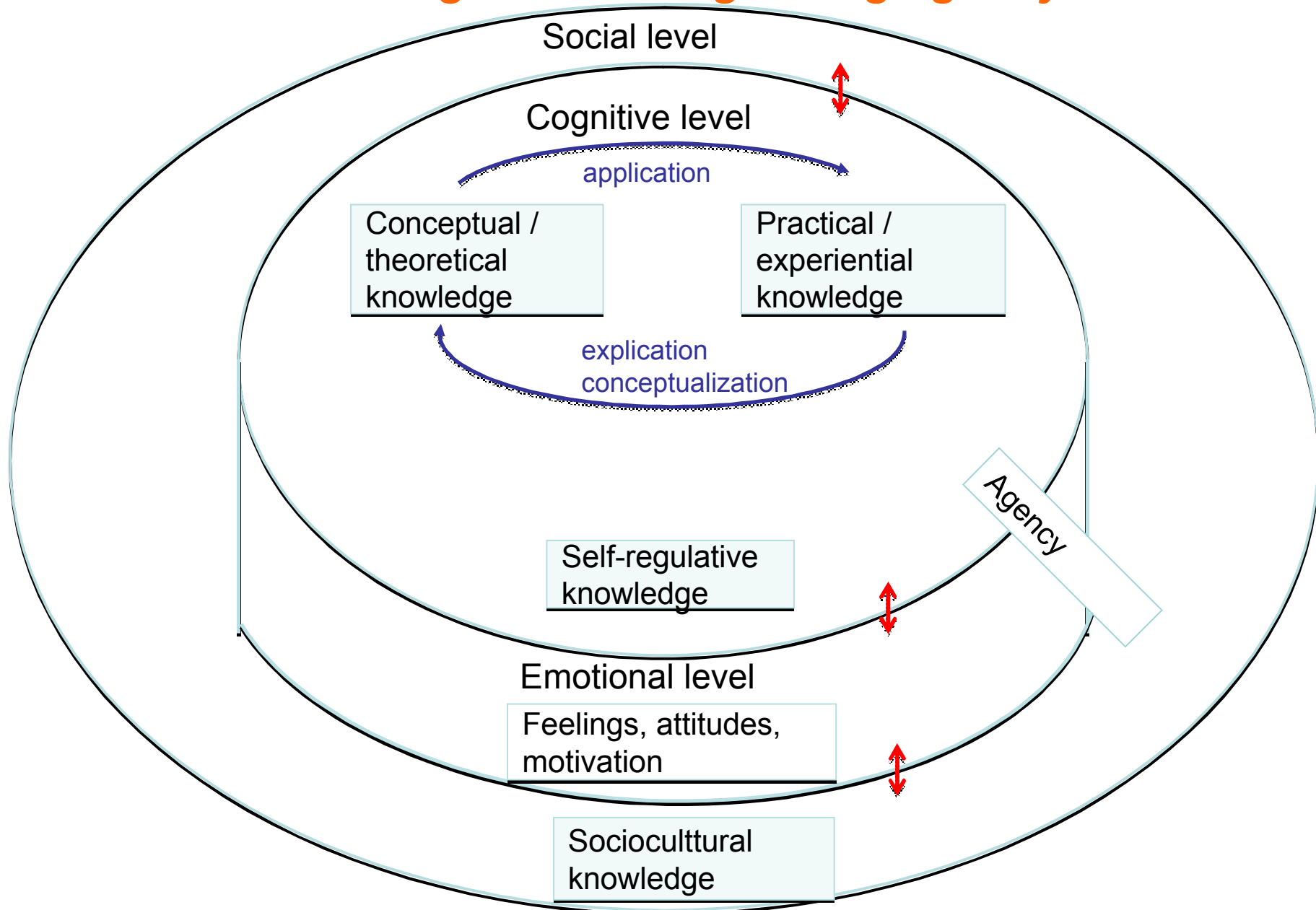
Elements of professional expertise



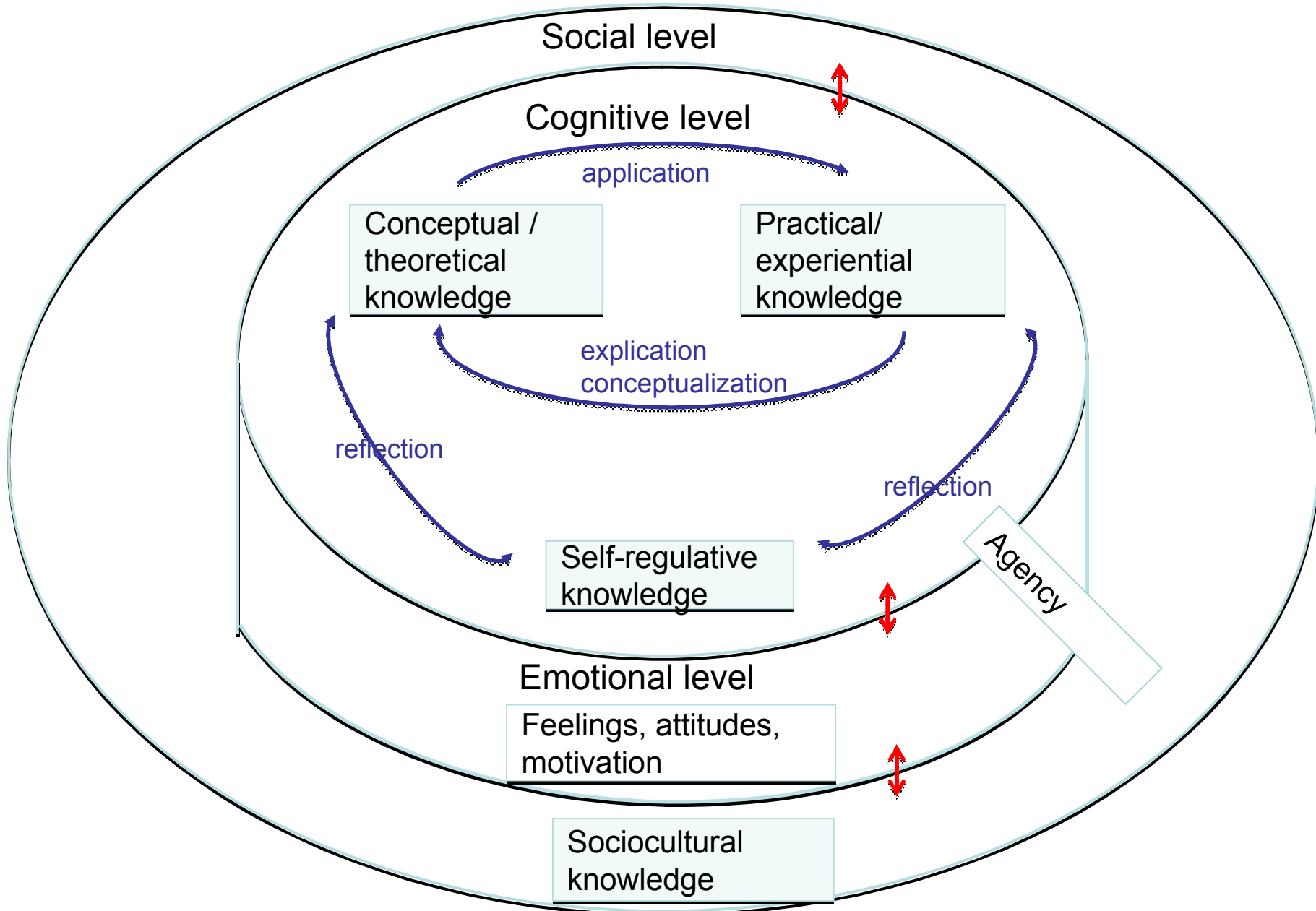
Development of expertise: integration of different forms of knowledge and strengthening agency



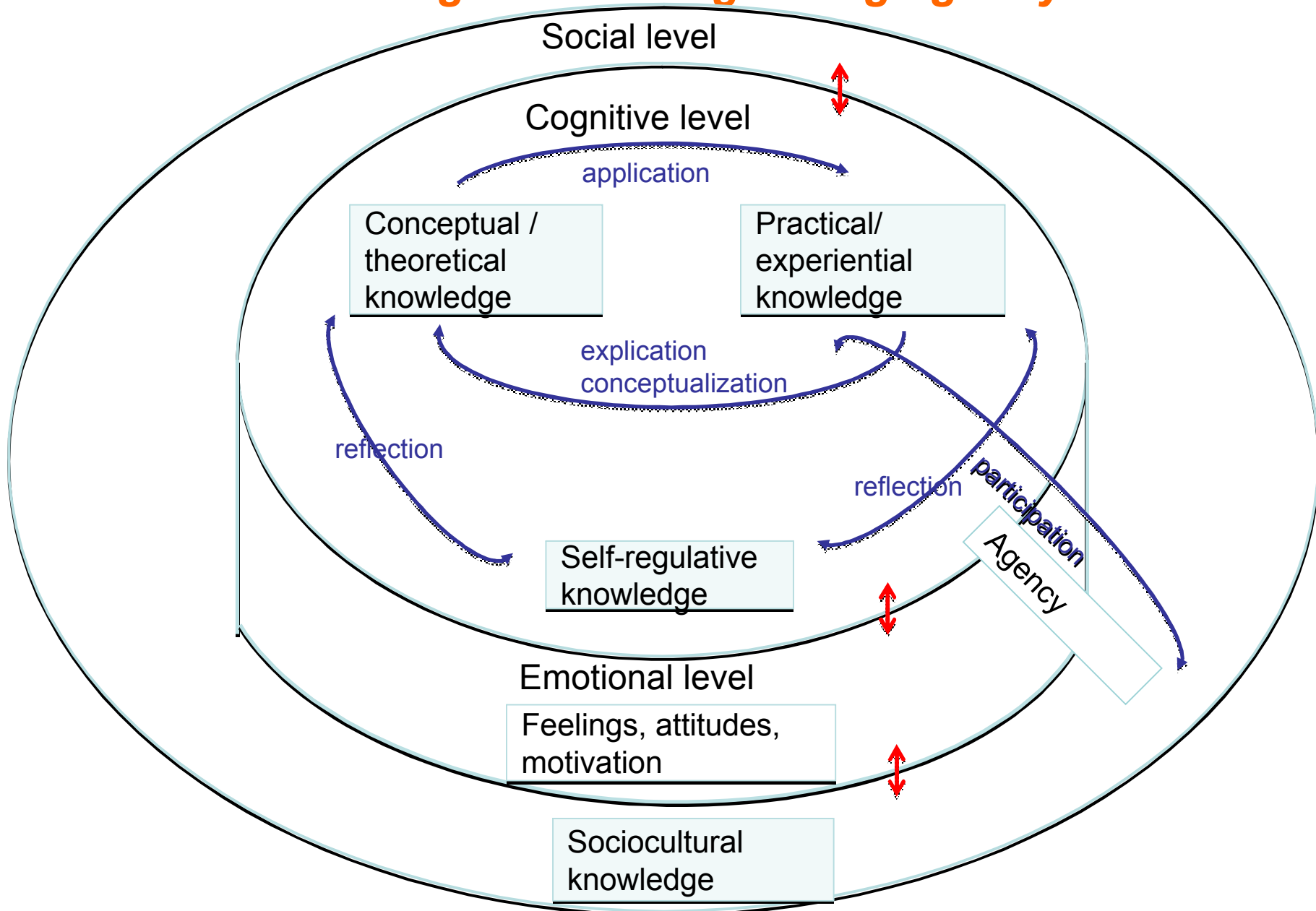
Development of expertise: integration of different forms of knowledge and strengthening agency



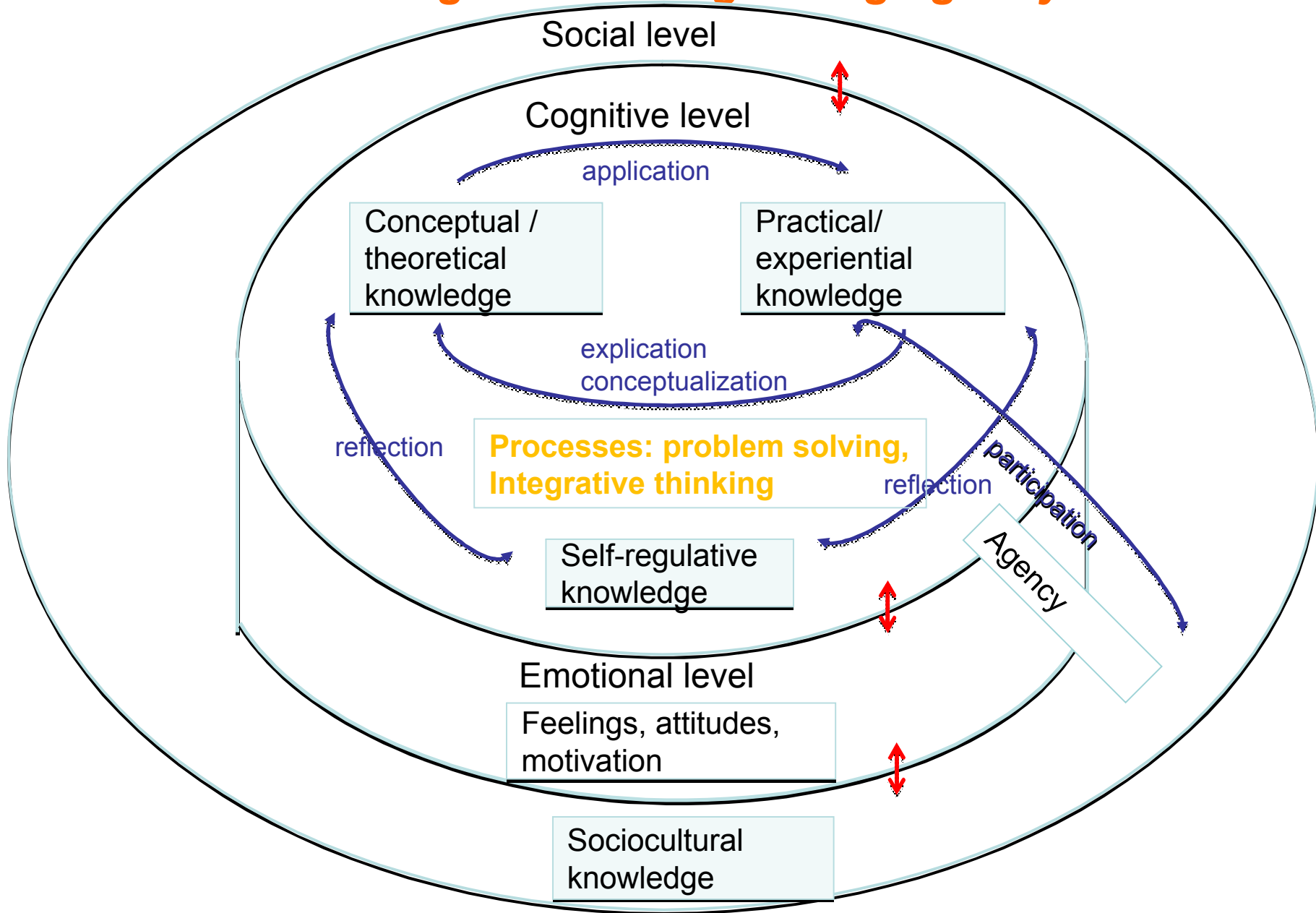
Development of expertise: integration of different forms of knowledge and strengthening agency



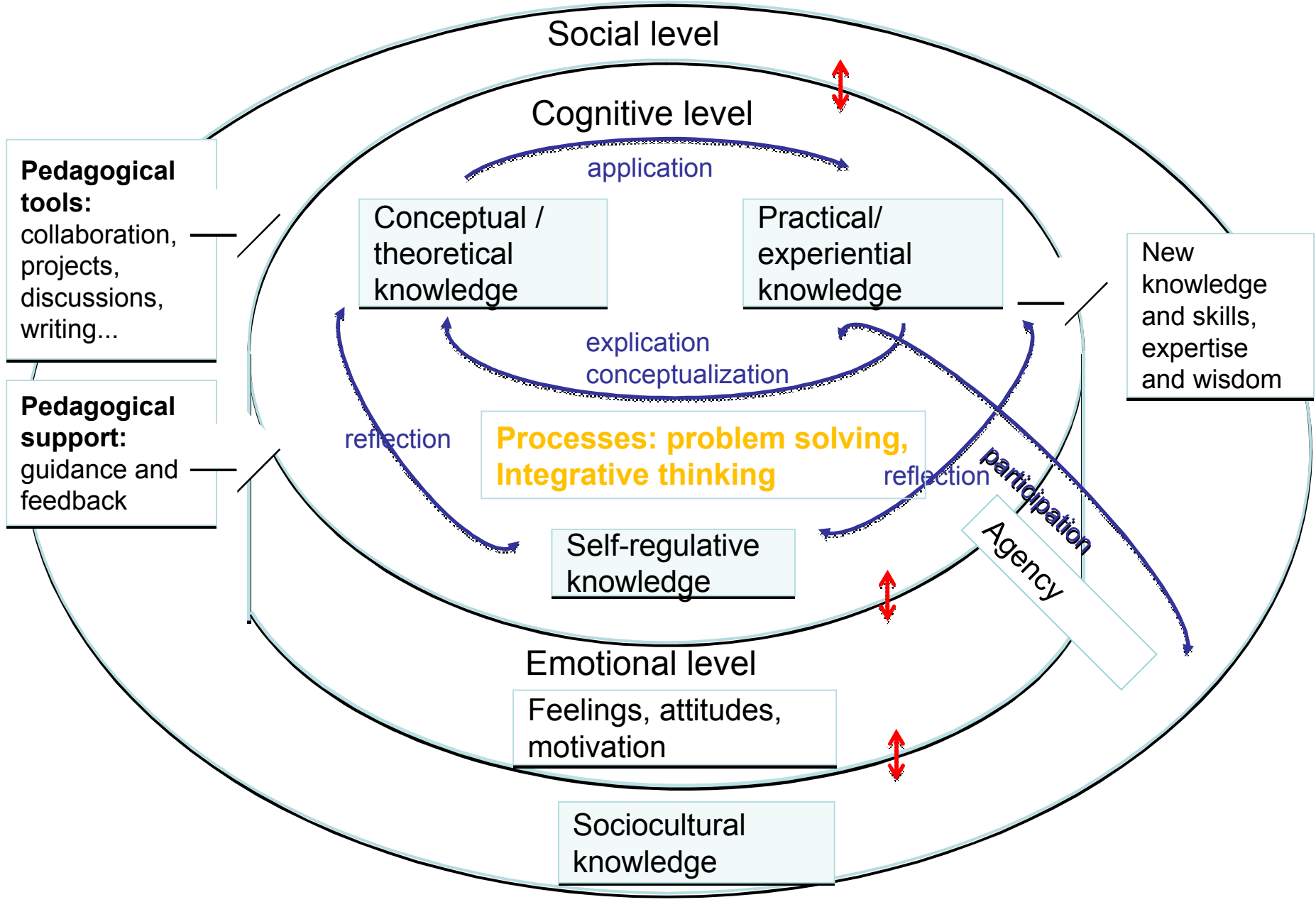
Development of expertise: integration of different forms of knowledge and strengthening agency



Development of expertise: integration of different forms of knowledge and strengthening agency

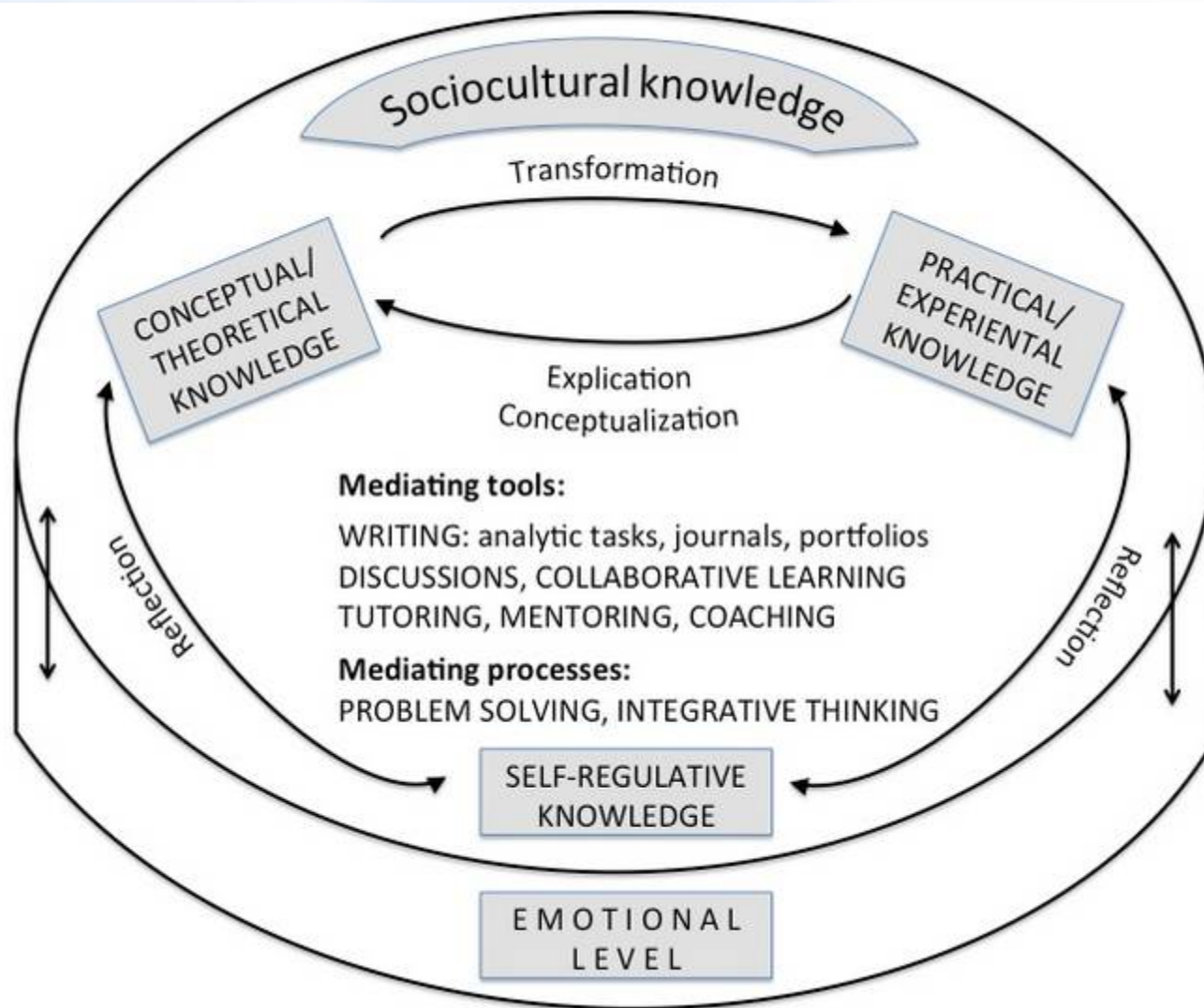


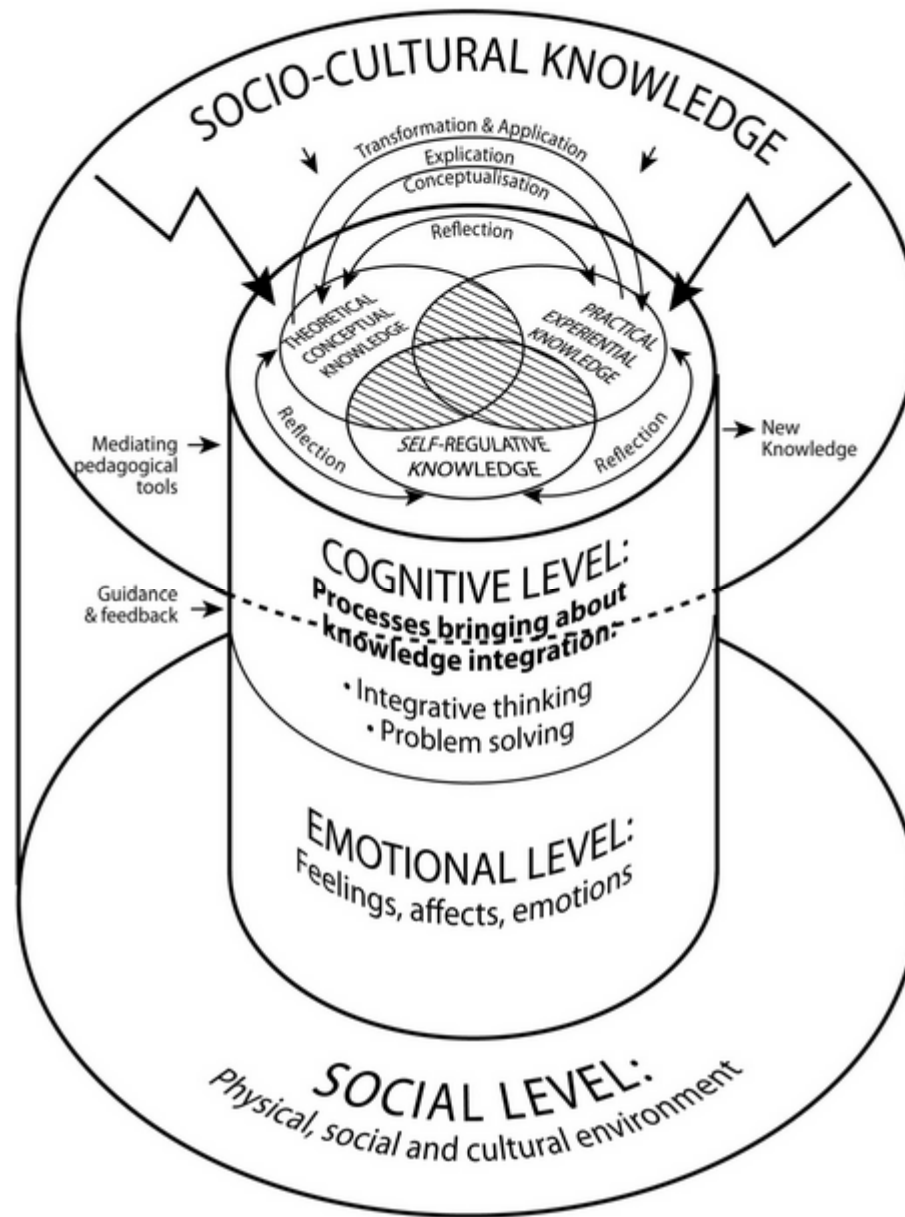
Integrative pedagogy

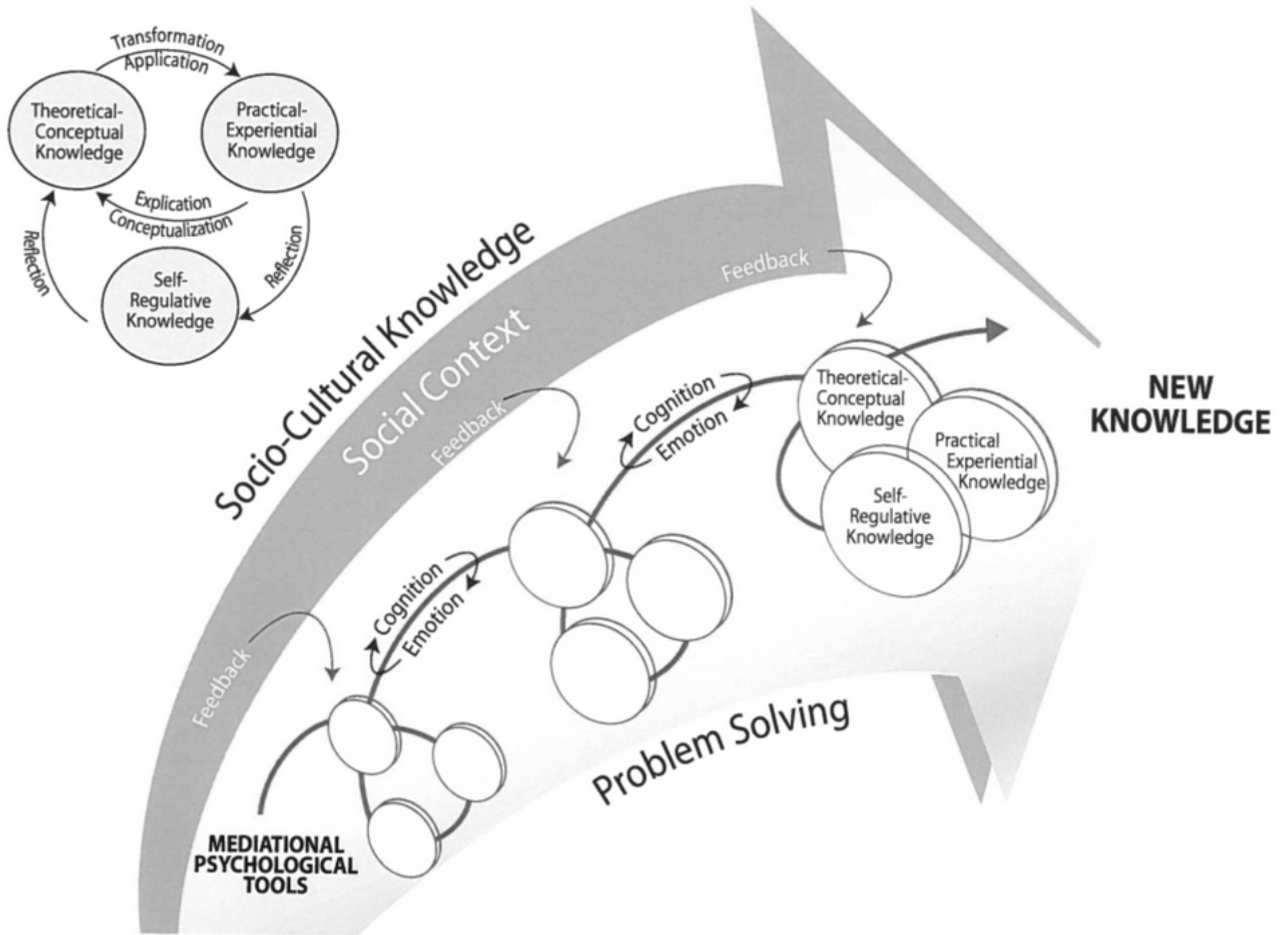


Integrative Pedagogy for developing future expertise

(Tynjälä, Virtanen, Klemola, Kostainen & Rasku-Puttonen, 2016; Tynjälä, Häkkinen & Hämäläinen 2014; Tynjälä & Gijbels, 2012; Heikkinen, Tynjälä & Kiviniemi 2011; Täks et al, 2014, 2016; Ortoleva & al, 2014, 2015, etc)







Integrative pedagogy integrates:

- Different elements of professional expertise: Conceptual, experiential, self-regulative and socio-cultural knowledge
- Different forms of thinking and intelligence (analytical, practical and creative; Sternberg, 2003)
- Academic knowledge and generic skills
- Learning and working
- Scientific thinking and concrete doing
- Formal and informal learning
- Individual and collaborative learning
- Cognition and emotion
- Possibly different disciplines
- Possibly physical, virtual and social learning environments



Empirical evidence

Factors promoting vocational students' learning at work in Finnish VET system (Virtanen, Tynjälä & Eteläpelto, 2014a)

Student-related individual factors	Social, institutional and structural features of the workplace	Educational practices
<p>Students' motivational orientations</p> <ul style="list-style-type: none"> - achievement orientation - learning orientation - invention orientation - initiative orientation - avoidance orientation <p>Students' prior work experiences</p>	<p>Students' experiences of work communities</p> <ul style="list-style-type: none"> - social and interactional support - availability of individual guidance - active membership <p>Discussions at work</p> <ul style="list-style-type: none"> - with the workplace trainer - with other employees <p>Content of guidance discussions</p> <ul style="list-style-type: none"> - guidance concerning work and work environment - guidance concerning student's own development and assessment <p>Size of the workplace</p>	<p>Integration of school learning and workplace learning</p> <ul style="list-style-type: none"> - integration between school learning and workplace learning - connection between school and work <p>Different forms of guidance</p> <ul style="list-style-type: none"> - discussion with teacher - discussion together with teacher and workplace trainer - assignments from school - learning journals <p>Length of workplace learning periods</p> <p>Setting the goals for workplace learning periods</p> <p>Self-assessment of one's own work</p>

Predictor variables for students' WPL outcomes (all fields) ($R^2=50\%$) (Virtanen, Tynjälä & Eteläpelto 2014a)

1. Active membership (ensured by the workplace) $\beta= .226$
2. Integration between school learning and workplace learning (WPL) (=Integrative pedagogy) $\beta= .196$
3. Invention orientation $\beta= .196$
4. Learning orientation $\beta= .161$
5. Self-assessment of one's own work $\beta= .149$
6. Availability of individual guidance $\beta= .147$
7. Guidance concerning student's development and assessment $\beta= .126$

(Yellow = social, institutional and structural features of workplace

Green = educational practices

Violet = student related individual factors)



(Virtanen, Tynjälä & Eteläpelto 2014a; 2014b)

Commerse and administration (R²= 59 %):

- 1) Integration of school learning and WPL (=Integrative pedagogy) $\beta = .329$
- 2) Active membership in workplace $\beta = .260$
- 3) Availability of individual guidance $\beta = .183$
- 4) Invention orientation $\beta = .166$
- 5) Self-assessment of one's own work $\beta = .160$
- 6) Initiative orientation $\beta = .159$
- 7) Size of workplace learning site $\beta = .150$

Social and health care (R²=50 %):

- 1) Availability of individual guidance $\beta = .215$
- 2) Integration of school learning and WPL (=Integrative pedagogy) $\beta = .198$
- 3) Active membership in workplace $\beta = .197$
- 4) Invention orientation $\beta = .193$
- 5) Discussions with the workplace trainer $\beta = .162$
- 6) Setting goals for workplace learning period $\beta = .137$
- 7) Discussion with teachers $\beta = .091$

Factors explaining learning of generic skills in university (Virtanen & Tynjälä, 2015; 2016)

Building the regression model:

✧ **Dependent variables: selected generic skills** (e.g. Barrie, 2006; Binkley et al., 2012; Clanchy & Ballard, 1995; Jones, 2009; Krause, 2014)

✧ **Independent variables: pedagogical practices of the course**

- **1) different forms of teaching and learning (12), such as lecturing, working together and reading** (e.g., Lueddeke, 2003; Neumann, Parry & Becher, 2002; Smeby, 1996; Ylijoki, 2000)
- **2) the features of constructivist learning environments (24) and the model of integrative pedagogy** (e.g., Duffy, Lowyck & Johassen, 1993; Loyens & Gijbels, 2008; Tynjälä, 1999; Tynjälä & Gijbels, 2012; Tynjälä, Pirhonen, Vartiainen & Helle, 2009; von Glasersfeld 1995)
- **3) the atmosphere of the courses** (e.g., Binkley et al., 2012; Eteläpelto & Lahti, 2008; Hämäläinen & Vähäsantanen, 2011)
- **4) the assessment** (e.g., Biggs & Tang, 2007; Struyven, Dochy & Janssens, 2005)

Problem-solving skills

(Virtanen & Tynjälä, 2016)

✧ **Ability to solve occupational problems (R²=47 %)**

- 1) **Acting at the interface between theory and practice (β= .601)**
- 2) **Working alone (NEGATIVE) (β= -.220)**

✧ **Problem-solving skills (R²=49 %)**

- 1) **Acting at the interface between theory and practice (β= .314)**
- 2) **Reading (NEGATIVE) (β= -.225)**
- 3) **Working together with others (β= .212)**
- 4) **Assessment of other students' work (β= .203)**

Operating in new situations

(Virtanen & Tynjälä, 2016)

✧ **Ability to operate in new situations (R²=42 %)**

1) Acting at the interface between theory and practice ($\beta = .395$)

2) Reading (NEGATIVE) ($\beta = -.246$)

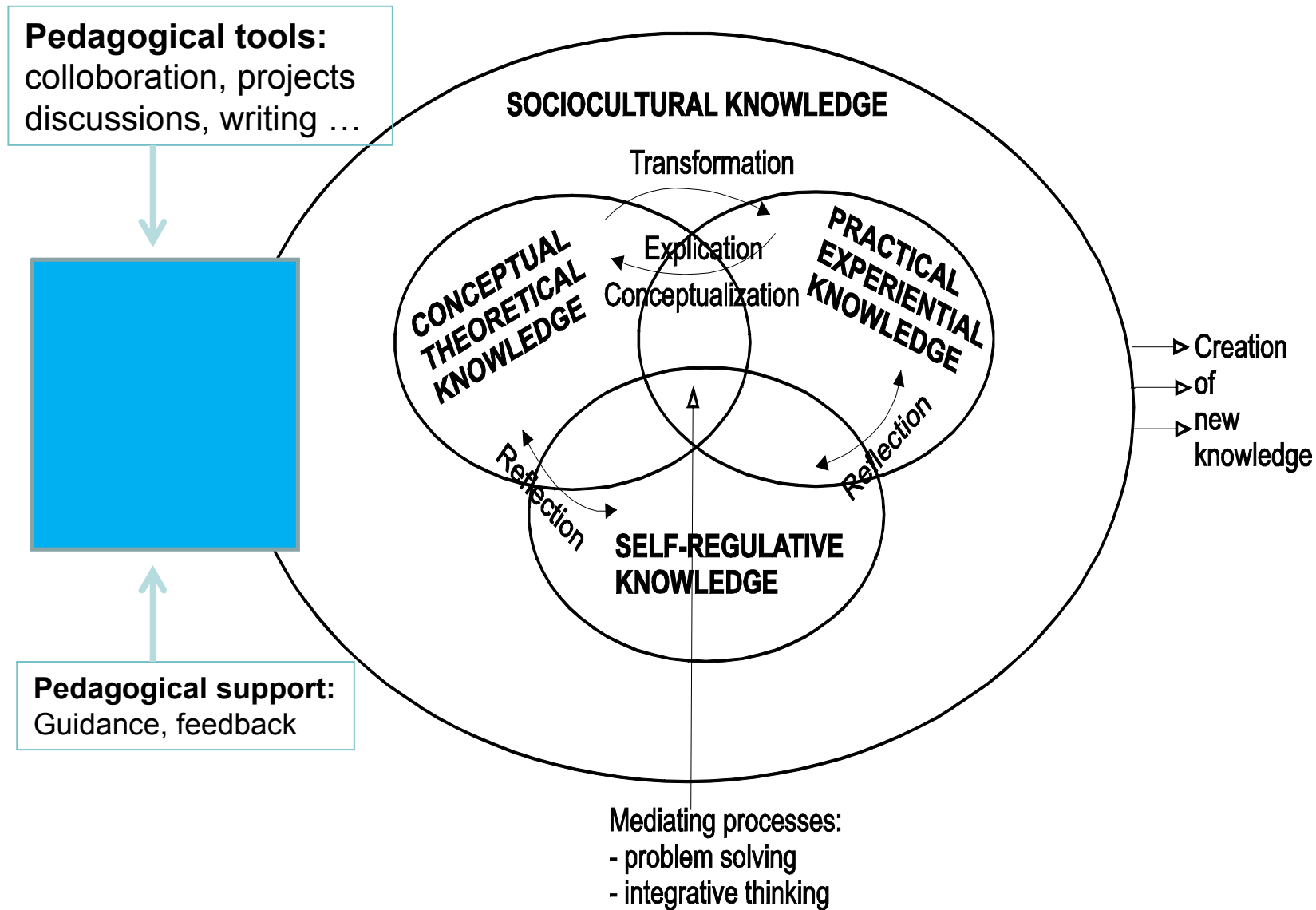
3) Sharing and utilizing students' earlier experiences and knowledge ($\beta = .213$)

21.8.2015

Integrative Pedagogy and e-Learning



Integrative Pedagogy and E-Learning



The world is full of technologies that can be used for learning

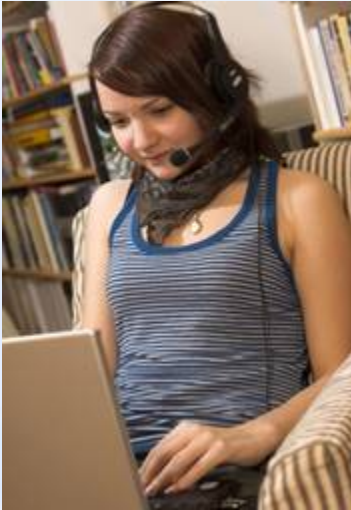


Photo: Martti Minkkinen



<http://www.dokeos.com/fr/e-learning-mooc-entreprise-outil-formation-drh/>



<http://abovethelaw.com/2010/12/the-big-secret-of-social-media/>

<http://users.utu.fi/mpsain/Japanin%20kuvat/studying.gif>



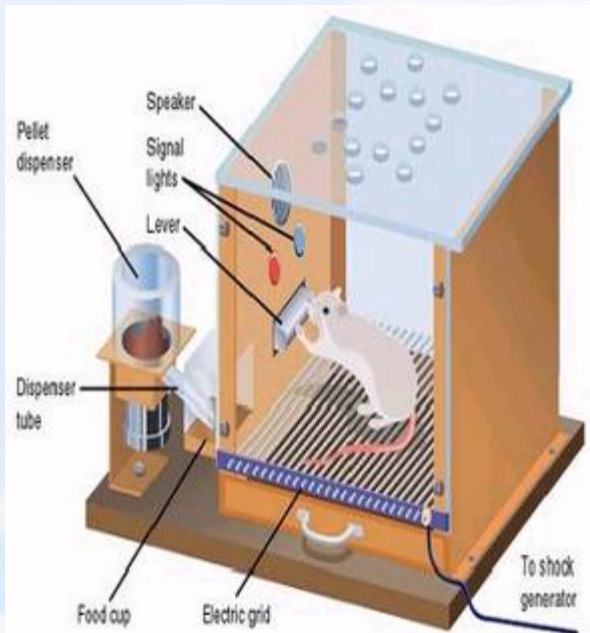
“What changes rapidly is the technology, not the basic processes of learning”

(Tynjälä & Häkkinen, 2005)



The view of learning is what matters

Behaviorism



http://www.scottsdalecc.edu/ricker/psy101/readings/Section_3/images/skinner_box.jpg

Learning = change
in behavior
Note: in behavior, not
in thinking

Constructivism



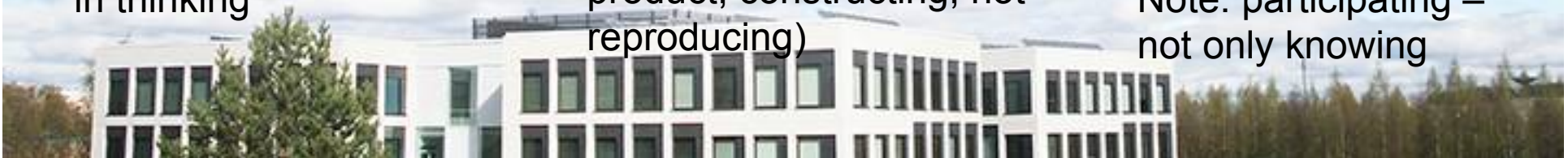
Learning = a process of
constructing knowledge
(Note: process, not only
product; constructing, not
reproducing)

Situationalist theories



http://www.fahcsia.gov.au/sa/disability/pubs/Documents/ConsumerTrainingSupportProducts/employees/when_i_am_at_work_working_committee/powerpoint_slides.htm

Learning = becoming
able to participate in
communities of practice
Note: participating –
not only knowing



Example of **behaviorism**
and e-learning

**Rewarding right responses:
Ekapeli – a learning game
for Finnish children
learning to read**



[http://www.lukimat.fi/lukeminen/
materiaalit/ekapeli](http://www.lukimat.fi/lukeminen/materiaalit/ekapeli) (Finnish)

<http://www.lukimat.fi/lukimat-en>
(English)

SU

ue

eo

ou



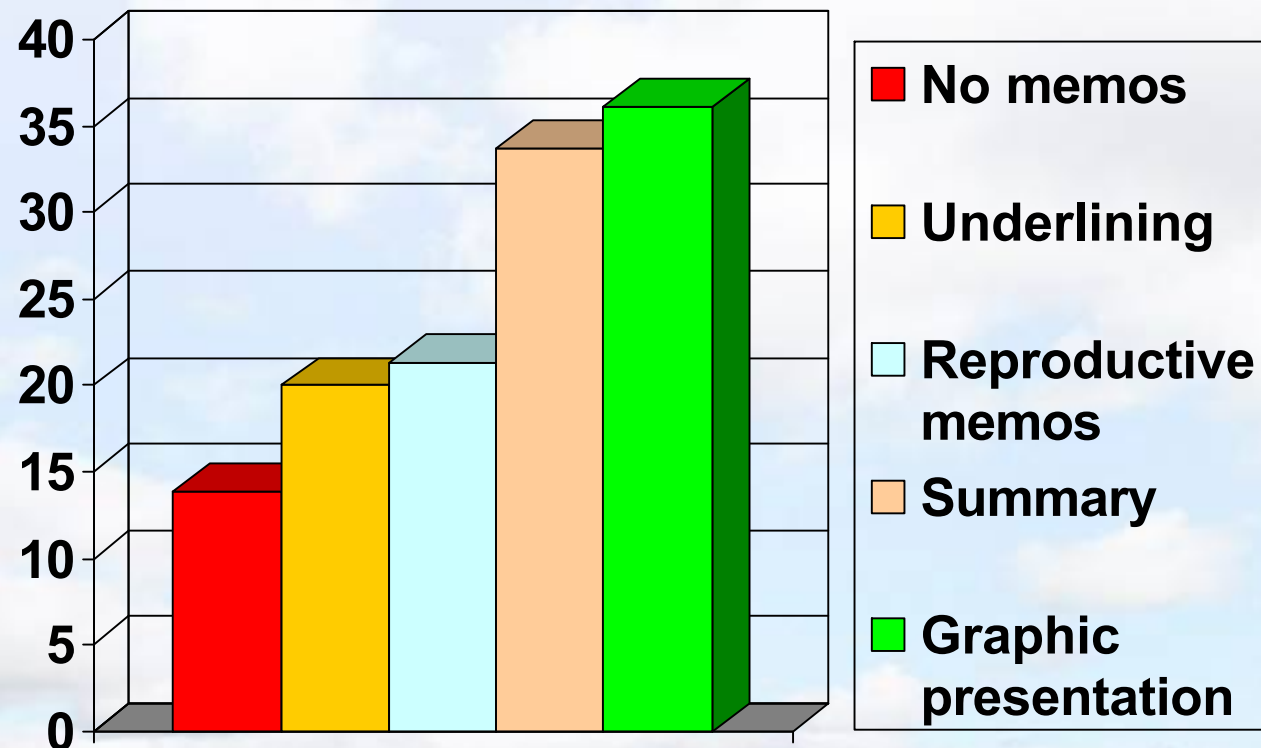


2



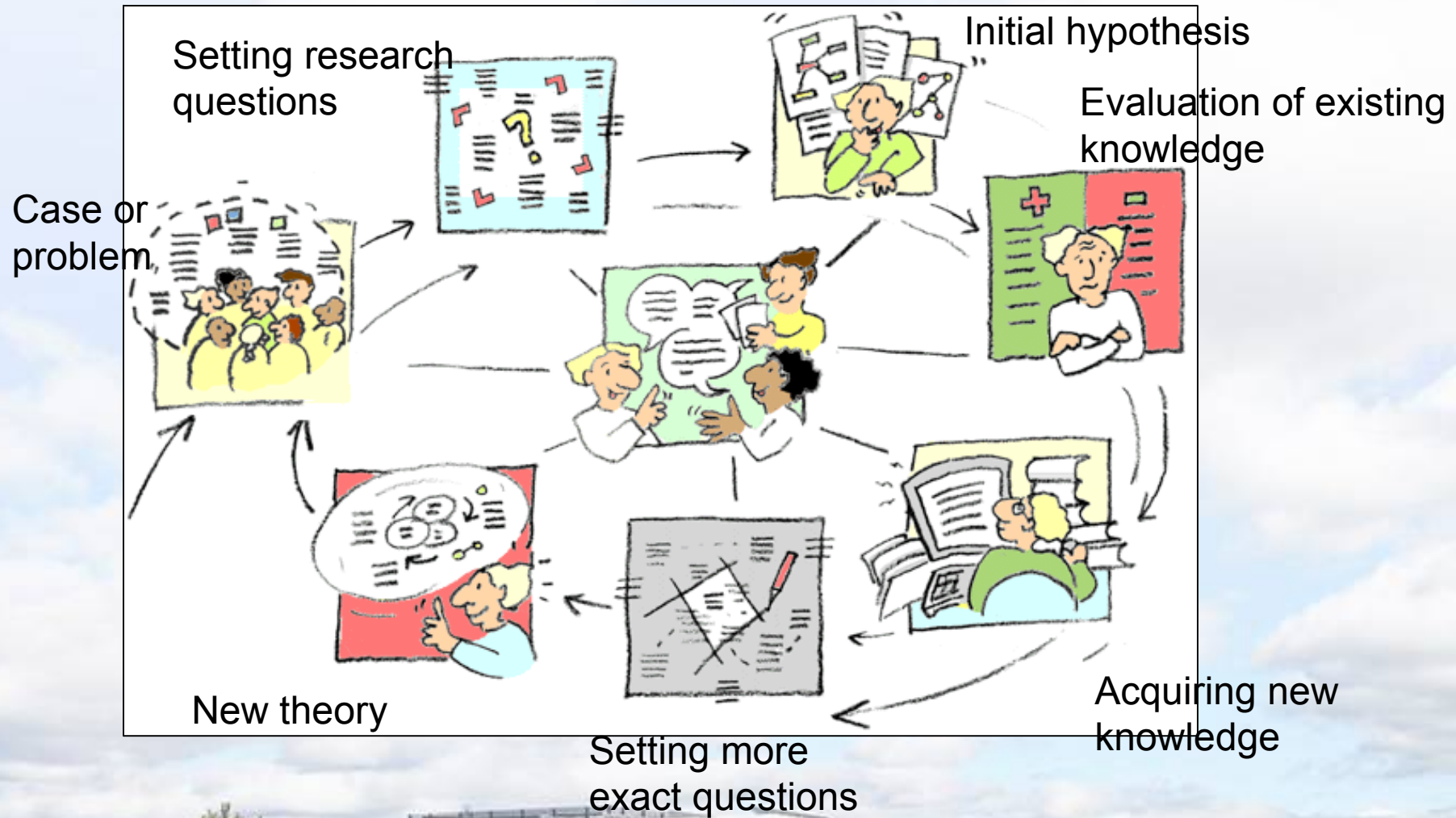
Constructivism: The more actively you process information the better learning outcomes will be

University entrance examination: Percentage of those who got the study place (Lindblom-Ylänne et al. 2002)



Inquiry-based learning & knowledge building

(e.g. Hakkarainen, Lonka & Lipponen, 2004; Muukkonen, H. Lakkala, M. & Hakkarainen, K. 2003. Computer-mediated progressive inquiry in higher education. In T. Roberts (ed). The Online Collaborative Learning (pp 28-53). Hershey: Infosci.)



Situational view: Importance of authentic, real life experiences

How do people learn at work:

- 1) by doing the job itself
- 2) by reflecting and evaluating on one's own (or others') experiences
- 3) through collaborating and interacting with colleagues
- 4) through working with clients
- 5) by tackling challenging and new tasks
- 6) through development projects
- 7) by participating in networks
- 8) through formal education

(e.g. Billett et al, 2005; Collin, 2002; Collin & Valleala 2004; Eraut, 2004; Heikkilä 2006; Poell 1998, 2006; Tikkamäki, 2006; Tynjälä 2008, 2013)



Photo: Martti Minkkinen



Photo: Martti Minkkinen

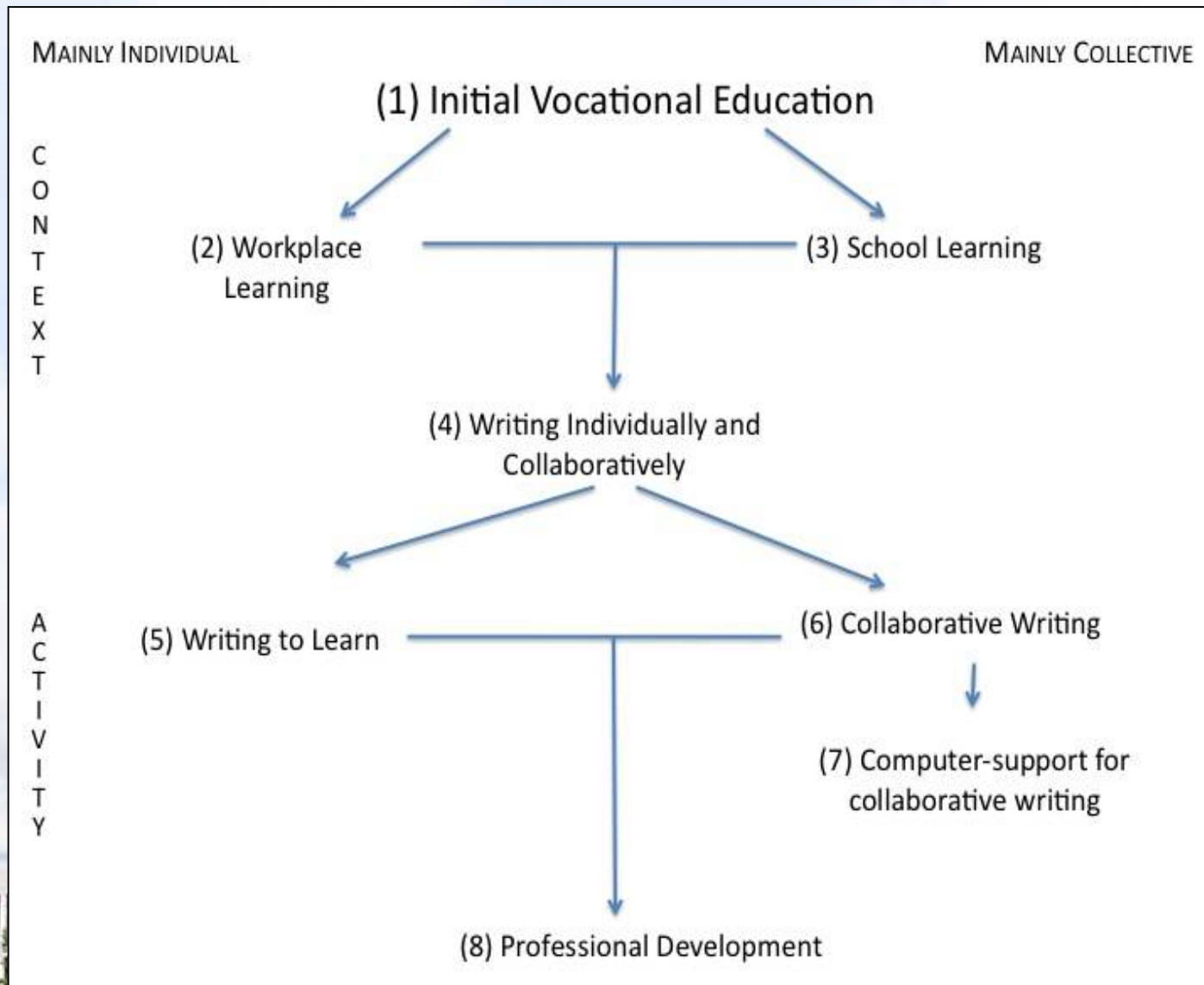


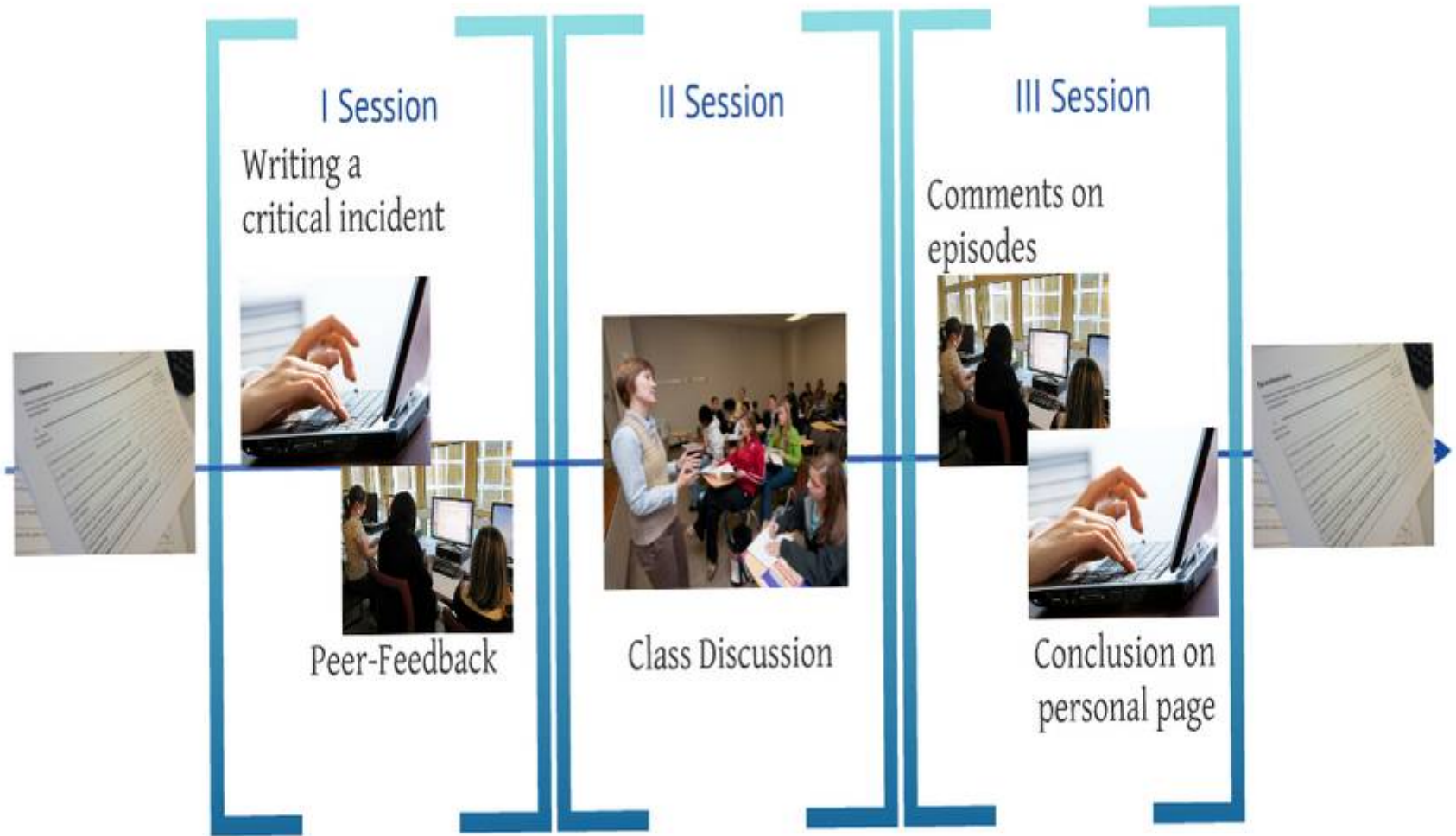
Karrasch et al. Lukion psykologia 4, p. 141

Integrative Pedagogy and Technological Tools:

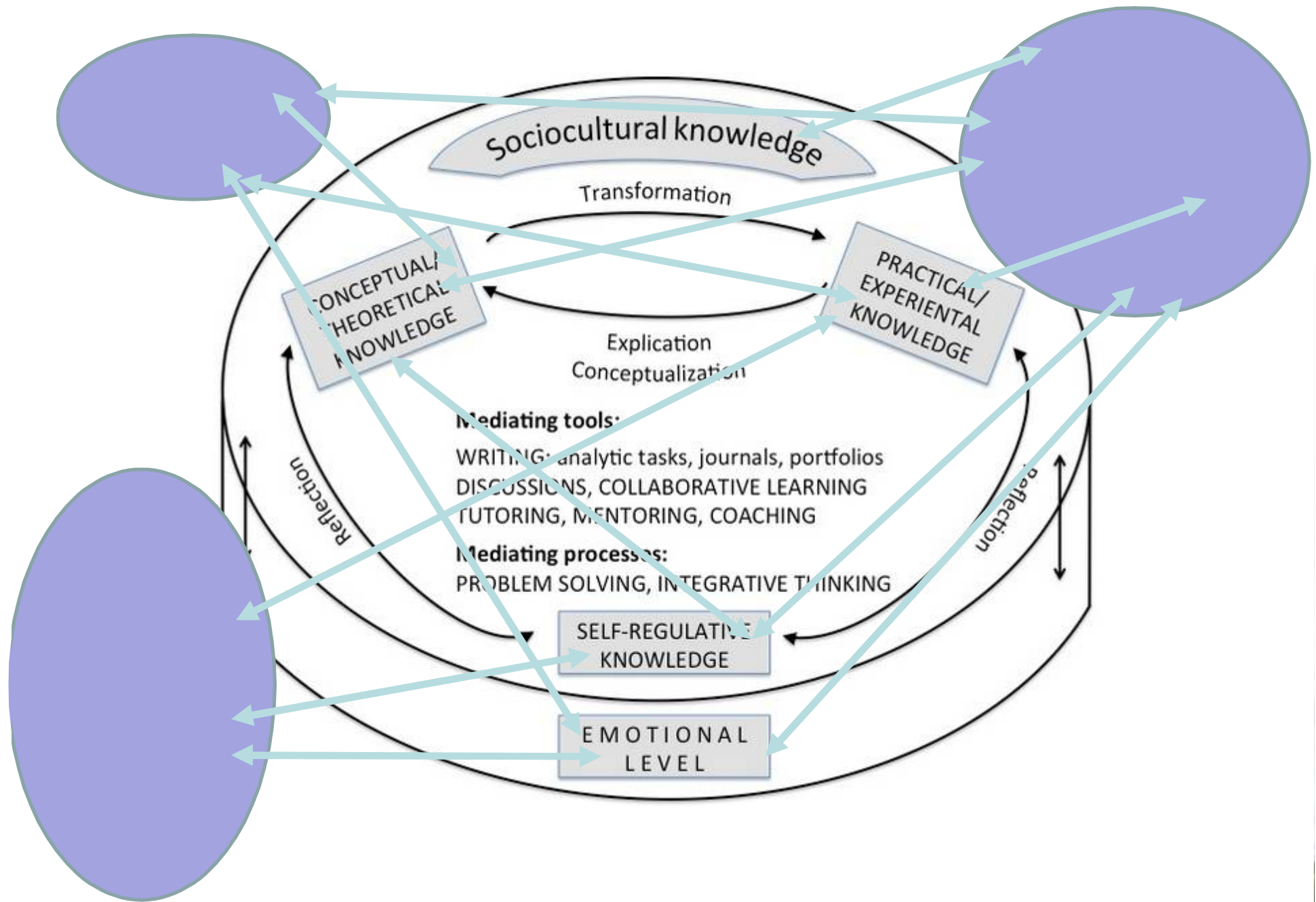
Computer-supported collaborative writing for professional development

(Ortoleva 2015; Ortoleva & Bétrancourt 2014; Ortoleva, Schneider, Bétrancourt, 2013)





Ortoleva, 2015



Simulations replacing authentic learning environments

(Tynjälä, Häkkinen & Hämäläinen 2014;
Hämäläinen & Oksanen 2012)

- Technical equipment (e.g. flight simulators, patient simulators)
- PC / online learning games
- Role play simulations

Important: integrating conceptual knowledge and reflection to simulated activity

Karrasch et al, 2006: Lukion psykologia 3, Otava, p. 106.



<http://www.laerdal.fi/document.asp?subnodeid=14925384>



Integrating different forms of knowledge with simulation games

Learning leadership skills in a simulated business environment (Siewiorek et al 2011, 2012)

Game + reflective essays: -analysing game experiences in the light of business and leadership theories



GameBridge (Oksanen & Hämäläinen 2012)



<https://www.jao.fi/Jyvaskylan-koulutuskuntayhtyma/Hankkeet/Paattyneet-hankkeet/2011-paattyneet-hankkeet/Game-Bridge--peli/Pelin-esittely>

Oksanen, Mannila & Hämäläinen, 2011:
<https://jyx.jyu.fi/dspace/bitstream/handle/123456789/37472/978-951-39-4458-2.pdf?sequence=1>

GameBridge environment (Hämäläinen & Oksanen, 2012)

...”research has also shown that the quality of participants’ activity, rather than the virtual environment itself, brings about changes in the development of competences (Söderström et al., 2012; see also Hew & Cheung, 2013).” (Tynjälä, Häkkinen & Hämäläinen, 2014)

<https://www.jao.fi/fi/Jyvaskylan-koulutuskuntayhtyma/Hankkeet/Paattyneet-hankkeet/2011-paattyneet-hankkeet/Game-Bridge--pele/Pelin-esittely>

Oksanen, Mannila & Hämäläinen, 2011:
<https://jyx.jyu.fi/dspace/bitstream/handle/123456789/37472/978-951-39-4458-2.pdf?sequence=1>



Social media and integrative pedagogy

“... social media can provide mediating tools that enable the integration of different forms of expert knowledge... However, ... learning environments utilising social media tools are often loosely structured environments which presuppose that learners have strong self-regulative knowledge and skills” (Tynjälä, Häkkinen & Hämäläinen, 2014)

- It is important to guide students' learning
- Self-regulation as a goal, not a starting point assumption



Conclusions

Integrative pedagogy model emphasizes the holistic view of professional expertise:

- Skills and knowledge are not separate entities but tightly integrated
- Cognitive, social and emotional dimensions of human development are integrated as well
- Reflection of practical experiences with the help of conceptual tools is in the core of the learning processes

E-learning tools should support the integration of different forms of knowledge and skills, active knowledge construction and collaboration between learners



***Thank you
for your attention!***

paivi.tynjala@jyu.fi
anne.virtanen@jyu.fi



UNIVERSITY OF JYVÄSKYLÄ
FINNISH INSTITUTE FOR
EDUCATIONAL RESEARCH