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Research Report No. 22

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in the field of adult education?**

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Harteis, C., & Gruber, H. (2006). *How important is intuition for teaching expertise in the field of adult education?* (Research Report No. 22). Regensburg: Universität Regensburg, Lehrstuhl für Lehr-Lern-Forschung.

Research Report No. 22, September 2006

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**How important is intuition for teaching expertise  
in the field of adult education?**

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UBR 069034782303



609-1493

## Abstract

This contribution focuses on the role of intuition for teaching expertise in the field of adult education. The field of adult education is not well regarded in the field of research on expertise which investigates cognitive conditions for high professional performance. Theories of expertise convincingly explain the capability to solve known problems but have less power of explication for the capability of coping with new situations – as they often occur in the field of adult education. Intuition can be seen as the crucial component of teaching expertise which enables people to master unknown problems. This contribution describes the relevance of intuition for teaching expertise in adult education and presents findings from an empirical study with German teaching novices and experts in the field of adult educations. The results are surprising and offer lessons learnt for future research.

Keywords: intuition, teaching expertise, adult education

## Zusammenfassung

Der Beitrag fokussiert die Rolle von Intuition für die Lehrexpertise von Erwachsenenbildnern. Die Domäne Erwachsenenbildung wurde bislang von der Expertiseforschung vernachlässigt. Mit ihrem Akzent auf der Untersuchung der kognitiven Bedingungen exzellenter beruflicher Performance erklären Expertisetheorien überzeugend, wodurch die Lösung bekannter Probleme zustandekommt; zur Erklärung, wie neuartige und unbekannte Probleme gelöst werden, können sie allerdings weniger beitragen. Intuition kann hier als wichtige Erklärungskomponente fungieren, sie befähigt, unbekannte Probleme, wie sie gerade im Bereich der Erwachsenenbildung auftreten, zu meistern. Der Beitrag beschreibt die Relevanz von Intuition für Lehrexpertise in der Erwachsenenbildung und präsentiert Ergebnisse einer Studie an Novizen und Experten in der Erwachsenenbildung. Die überraschenden Ergebnisse enthalten vielfältige Implikationen für zukünftige Forschung.

Stichworte: Intuition, Lehrexpertise, Erwachsenenbildung



Adult education is a field in which (almost) no regulation exists for the acquisition of the teacher status. Thus, many adult education teachers do not acquire pedagogical background during their apprenticeship, and commonly shared “best practices” do not exist which could help to identify or define teaching and methodological standards. Such a lack of professional scaffold might suggest that teaching in the field of adult education is an issue of intuitive acting. However, not only the lack of a consistent professional scaffold indicates that intuition plays an important role for teaching. Theories of expertise as well ascribe intuitive dimensions a significant role for professional competence.

This paper investigates to what extent intuition can be seen as an important component of professional teaching competence in the field of adult educators. First it is discussed how intuition can be conceptualized in a fruitful way to explain and describe its relevance for the profession of adult educators in order to deliver a substantial contribution to the identification of good practice. Second, a study is presented delivering empirical evidence for the theoretical approach. Third, conclusions are drawn from the theoretical and empirical analyses about the development of research concerning the teaching profession in adult education.

### **Teaching in adult education as object of research**

Large parts of educational research focus on teaching and the learning of teachers so that teaching certainly is among the best investigated domains in education. Ample findings exist about the development from teaching novice to teaching expert (Berliner, 2001). The most prominent approach is research on expertise, which usually compares cognitive features of persons on different levels of expertise during solving problems or dealing with professional tasks (Ericsson, 2003). Expertise is defined by the capability to show excellent performance stable and repeatedly. However, it is very difficult to operationalise excellence in teaching, in particular in the field of adult education. Referring only to the amount of teaching days, participants, numbers of courses or turnover (if freelancers) would provide a quantitative measurement but might miss differences in quality of teaching. However, it is diffi-

cult to explicitly define qualitative features of high teaching performance and to find ways of measuring them. Most studies on expertise - not only in the domain of teaching - try to avoid such problems by operationalising expertise through the plain amount of experience in the domain. Studies on teaching expertise assume a time span of ten years needed for acquiring teacher expertise (Berliner, 2001).

Theories have received much attention which were developed on the basis of empirical findings from different domains, for instance the theory of knowledge encapsulation (Boshuizen & Schmidt, 1992) or the theory of learning from experience (Strasser & Gruber, 2004). These theories explain the growth of expertise by changes in the stock and the structure of explicable knowledge. On the way from novice to expert theoretical declarative knowledge is enriched by practical problem-solving and through deliberate practice. With increasing level of expertise, declarative knowledge loses its direct relevance for practical solutions, case-based patterns of practice emerge instead. At expert level, declarative knowledge is encapsulated in experience-based memory organisation packets – the so-called encapsulation theory thus describes how expert knowledge changes its quality if rich experience with domain-specific cases is acquired. Subjects at expert level, when asked about their ways of problem-solving, less frequently report the use of declarative knowledge than do novices, who still do not dispose on broad scope of practical experience. The theory of learning from experience describes cognitive processes occurring when practical reality confirms or contradicts a person's knowledge about procedures and operations. If practice confirms procedural knowledge as being appropriate for reaching action goals, this procedural knowledge is strengthened by reflective confirmation. As a consequence, learning from experience occurs. When procedural knowledge fails and this leads to a modification of that knowledge, then this can be called learning from experience, too.

As plausible, powerful and persuasive these models are, they nevertheless neglect another component of expertise. Both theories explain how to quickly and effectively solve known problems on the basis of existing knowledge stocks. As well they explain processes occurring when one's knowledge fails, but they do not

have explicative power for the capability of solving unknown, new problems. Procedural knowledge usually is modelled as a set of rules. Such rules are either on a rather abstract level in order to represent generalised operations, or they are related to singular concrete situations in order to represent specific operations. Examples from adult education illustrate both kind of rules: Expert subjects may react with discussion and reflection techniques in courses of vocational training as soon as mumbling indicates that a problem of understanding occurs among participants. On the other side, a specific rule might be to focus on facts and figures when giving courses for the medical staff of a hospital XY, because prior experience with that customer proved this organisation is most interested in such a procedure. Both kinds of rules are plausible and form an important part of professional practice. However, many real-life situations do not clearly fit into one of these patterns: When applying general rules of the first kind in a concrete, new situation, new decisions have to be made, and it is most probable that such decision are implicit in nature: In adult education, do reactions of newly encountered course participants fulfil the prerequisites of the general rule? Similarly, transferring specific rules of the second kind into new situations, requires difficult decisions as well. For example, do successful methods of teaching the administrative staff of a hospital that applies the western type of medicine transfer to the teaching of medical staff of a hospital which follows the Chinese approach of medicine? In both outlined cases, acquired expert rules may prove not helpful for making decisions - but nevertheless experts frequently show successful performance.

An additional, alternative approach is needed for explaining the experts' capability to close the gap between available knowledge stocks and unknown challenges. We argue that the most plausible approach in this respect is to refer to intuition. Intuition as a component of professional expertise seems to be of utmost importance for powerful and straightforward performance of experts in professional domains (Eraut, 2000a). However, in contrast to research on explicable stocks of expert knowledge, little empirical evidence exists about the role of intuition as a component of professional expertise. *A fortiori*, this lack of empirical evidence is

particularly deploring in the domain of adult education. Most research about the role of intuitive aspects of professional teaching (Eraut, 2002; Housner & Griffey, 1985; Humphreys & Hyland, 2002) has been conducted in schools or universities. On the other side, a large proportion of the literature about adult education focuses on education policy and professionalism (Hyland, 1998; Jubas, 2005; Taylor, 2006).

To put it pithily: Educational research on teaching in adult education does rarely focus on repertoires of professional knowledge. At best on the fringes researchers address intuition as component of professional expertise. One reason for that might be that intuition cannot easily be directly assessed. Another reason, however, may result from negative connotations of intuitive professional acting. For example, in the context of complaints about de-professionalisation in the field of adult education (Hyland, 1998), an unfavourable perspective may be taken towards intuition when conceiving intuitive acting as behaviour which is not linked to competence and expertise. It is plausible that such connotations are strengthened by the large range of esoteric literature on intuition. As a consequence, serious scientific approaches unfortunately are widely neglected which intend to conceptualize the construct of intuition and its relevance for professional teaching.

### **Scientific approaches of intuition**

A brief overview about different approaches is intended to classify the use of intuition for professional action in the following. It is then shown which kinds of knowledge appropriately can be applied to teaching in adult education. A number of empirical questions result from this analysis, which will be subject of the subsequent paragraphs.

#### *Models of intuition*

As a type of cognitive processes the phenomenon of intuition is object of philosophical, psychological, economical, and educational discussions. Among these disci-

plines – as common ground – intuition occurs in three different faces (Hänsel & Zeuch, 2003; Hauser, 2001).

*Intuition as knowing-how-to-act.* Experienced firemen act during emergency situations in fire efforts without reflection of alternatives. In self reports they describe themselves that “they just came up with a single course of action and carried it out” (Klein, 2003, p. 15), absolutely sure to do the right, but not under balancing of alternatives. They act intuitively and adequately. There is a direct analogy to experiences trainers report in adult education when describing their way of running courses as just knowing how to act with participants – without processing a conscious consideration of alternatives and options.

*Intuition as sudden inspiration.* If analyzing a problem and thinking about opportunities for proposing solutions, the moment of finding the final approach does not necessarily depend on particular cognitive activities. The thought comes just like incubation. People often are not able to describe what had happened in this very moment of insight (Arvidson, 1997). Jagla (1994) delivers detailed descriptions of such moments in teachers’ daily work-life. Barkley, Cross, and Major (2005) illustrate situations of didactic planning of vocational trainings when suddenly the certainty arose that a certain group method will prove appropriate for reaching the respective learning goals. Ex post it is almost impossible to reconstruct such a process of insight.

*Intuition as gut feeling.* Managers describe situations within project meetings, when discussions and presentations provoke negative feelings and doubts about the procedure, even if rational reason cannot be provided for these feelings. The managers frequently report to have reacted appropriately, if they followed that fuzzy feeling and decided against the projects (Agor, 1989). Analogously, Gladwell (2005) described cases when fakes of historical arts could be identified by experts, not before a kind of body feeling suggested to doubt the arts’ pretended origin. Those experts report that a particular sensor perception, which cannot easily be rationally explained in its origin, set the point for these decisions which afterwards are interpreted as indicators for their high degree of expertise. Gut feelings, as described

here, can also influence administrative decisions in adult education – for instance when a teaching contract is to be negotiated on acceptance or rejection.

Each of these facets of the intuition phenomenon refers to a rational way of improving professional acting towards a level of high quality. In different disciplines, however, researchers discuss the topic from different perspectives: Philosophers discuss the nature and the origin of intuition, whereas economists discuss the efficiency of intuitive decisions. In this paper, psychological and educational aspects of intuitive decisions are focussed. From this perspective, a theoretical model is outlined for intuitive cognitions and their impact.

The above-mentioned models of intuition have in common that intuition, generally speaking, aims at the regulation of actions beyond rule-based criteria and without attention. It seems to be a domain-specific capability to be able to make appropriate decisions without balancing various alternatives (Myers, 2002). Intuition reverts to knowledge-resources persons are (no longer or still or currently) not aware of. When professionals act intuitively, they have cognitive resources free for different issues, because the intuitive decision does neither cost attention nor concentration. This might substantially contribute to professional experts' higher performance compared to those who do not act intuitively (Hogarth, 2001). A different aspect may be seen in the speed of acting, because intuitive actions occur faster than actions based on rational balancing (Eraut, 2000b). The appreciation of intuition as a component of professional expertise nicely corresponds with a prominent model of the development from novice to expert introduced by Dreyfus and Dreyfus (1986), who equated expert status with the capability of intuitive acting. Trainers in vocational education, who do not have to concentrate on deciding about bagatelles during their stage performance, have more capacity available to respond to individual needs of participants, because it is more probable that they perceive those needs.

#### *Cognitive background of intuitive acting*

A number of theoretical models has been developed to provide an understanding for the cognitive basis of intuitive decisions. Myers (2002) and Klein (2003) assume

that mental models based on experience during the professional career are used as patterns for intuitive decisions. Experts create mental models for real or imagined situations and problems, they mentally test their suitability, and they store them as acting patterns. In case of unexpected problems during professional practice, similarities of situations with mental models determine the decision for/against an action. This allows rapid decisions without balancing alternatives, often even without the subject's attention. In interview studies, Klein (2003) aimed to investigate decision strategies. He asked experienced firemen about their professional practice. They surprisingly frequent negated the question, whether they have to make decisions out in the field. Klein (2003) consequently discarded rational choice assumptions, which would imply a sophisticated evaluation of several alternatives in search for the optimal solution. He found out that the experienced firemen intuitively decided for a satisfying solution which corresponded with available mental models. Such decisions do not necessarily reach the level of awareness, but rather can remain implicit unless unexpected discrepancies occur. Although alleged evident, this approach does not address the distinction between explicit and implicit or tacit knowledge, introduced by Polanyi (1964), which constitutes an alternative theory to explain intuitive capabilities.

Explicit knowledge denotes this part of cognitive structures which easily can be reproduced and verbalized by subjects. In contrast, subjects are not aware of their implicit or tacit knowledge. Without any doubt, humans perceive a higher proportion of impulses without conscious attention than stimuli which are processed consciously. However, stimuli which do not receive conscious awareness, are not necessarily neglected. Many of those are effective although unattended; it has been argued that those are the basis of implicit knowledge. For example, Schacter (1987) and Reber (1989) could show that subjects make use of an implicit memory, which influences action processing but cannot be recalled in direct tests. Although such a type of knowledge has mainly been applied in therapeutic contexts, it is also of relevance for adult learning. For example, the memory from one's learning biography might well influence participants' responses on instruction even if not con-

sciously remembered. Analogously, prior teaching experiences can influence current teaching activities.

However, there is also a different way of building up implicit knowledge: During learning processes, explicit knowledge can become implicit, when behaviour becomes routine. Hogarth (2001) mentions the convincing example of infantile processes while learn to walk. As long as the child is not acquainted with the movement, walking demands attention. In this stage of learning, the child would fall down if being appealed and, thus, distracted. However, after a period of deliberation walking becomes automatic and the child soon is able to walk and to simultaneously pay attention to something else.

In both cases, implicit knowledge comprises cognitive structures which are not necessarily conscious but nevertheless directly influence professional performance.

Bowers, Regehr, Balthazard, and Parker (1990) developed a model of intuition which favours an opposite conception of development. In accordance with the assumption of principal efficiency of implicit knowledge, their approach of intuition includes a phase of judging an unknown situation under a particular pattern, which cannot be explained by the subjects. Bowers et al. (1990) call this phase "intuitive perception". Afterwards, subjects focus on conscious knowledge and theories, so that at the end of the learning process the intuitive perception becomes explicit and is applied onto the subject's prior knowledge. By designing such a theory, prior implicit knowledge received much importance because it determines later interpretations of a field. Such a theory converges with trainer legends, who proclaim the importance of particular adult teachers' teaching approach, which appeals much attraction both to colleagues and to potential participants. Popular examples for Germany might be trainer-"gurus" like Ulrich Strunz (for motivation) or Anselm Bilgri (for organisational culture), who are supposed to have a specific approach to perceive, analyse, and explain the world.

*Implications for empirical studies*

Each of the mentioned approaches has its own credits and credibility. All are theoretical models of cognitive processes, which are defined as intuitive decisions. Thus, each of these approaches explains intuitive decisions under certain theoretical assumptions. None of these assumptions includes notions about brain processes or other physical phenomena. The empirical analysis of intuitive decisions usually focuses on the general question whether subjects are able to come to appropriate intuitive decisions. The most popular research strategy for investigating the nature of intuitive decisions is the approach by which intuitive decisions are contrasted with decisions which are supposed certainly not to be intuitive.

Accordingly, Hogarth (2001) suggests a model of parallel systems of information processing reaching from the innate to the fully conscious. These systems operate continuous and parallel. Hogarth (2001) distinguishes automated and non automated systems: Non automated systems (e. g. rational information processing) demand the subject's attention, whereas automated ones (e. g. intuitive information processing) run without the subject's attention and awareness. Hence, a possibility of studying the quality of intuitive decisions is to put subjects into situations in which their attention is fully needed by another task than decision-making. The quality of decision-making is then compared with decision-making in situations which do not produce cognitive load through a different task. Many researchers in the field of decision-making agree that it seems appropriate to assume two parallel systems, a rational one and an intuitive one (Gigerenzer, Hoffrage, & Kleinbölting, 1997; Klein, 2003; Myers, 2002; Tversky & Kahneman, 2002; for overview see Goldstein & Hogarth, 1997; Schneider & Shanteau, 2003). The rational system demands attention and awareness, whereas the intuitive system stays beyond the level of consciousness. Thus intuition can hardly be verbalised and has to be assessed indirectly (Klein, 2003).

Crossan and Sorrent (1997) point out that intuition refers to distilled experience. In this respect, intuition clearly has to be interpreted as a component of professional performance, because intuition is (and has to be) developed during the

occupational biography. Thus it can be hypothesized that domain experts make more and better intuitive decisions than novices in the same domain. The quality of an intuitive decision in a professional field, however, can be determined only a posteriori and in relation to a concrete case and to generally agreed norms or conventions.

Both the tradition of research on expertise and the psychology of knowledge suggest an interpretation of intuition as a domain-specific feature. In contrast, different approaches exist which assume that intuition is a feature generally affecting a persons' acting in several domains (Bastick, 2003; Cappon, 1989).

Thus, in total four implications for empirical investigations result from the theoretical contributions to the discussion about intuitive decision-making:

- (1) The investigation of intuitive decisions usually comprises a comparison of intuitive and non-intuitive decision-making.
- (2) Intuition has to be assessed indirectly.
- (3) Intuition is a quality to be developed during a professional career.
- (4) Intuition is not a personal trait but a domain-specific capability.

### **Test of empirical evidence**

It was argued above that intuition can be seen as a crucial component of professional expertise in adult education. The capability to act intuitively offers plenty advantages in professional life. Theory suggests at least three assumptions. (1) Intuition refers to the rich panel of an individual's distilled experience. Hence, people at the beginning of a career in adult education should have different prerequisites for acting intuitively than those who are experienced in this domain. This suggests to conduct an empirical study using a design in the tradition of research on expertise by contrasting novice adult educators with experienced ones. (2) In human information processing, two parallel, synchronously working systems can be distinguished, a rational and an intuitive system. (3) The conceptualisation of intuition as

cognitive construct based on experience and on implicit and explicit knowledge suggests an understanding of intuition as domain-specific. Thus, the following research questions have to be answered in order to test the theoretical approach for empirical evidence:

- (1) Do expert adult educators and novices differ in the amount of intuitive decisions in teaching situations?
- (2) Do expert adult educators and novices differ in the amount of rational decisions in teaching situations?
- (3) Is intuition a domain-specific capability or a general tendency for acting in daily life?

### *Sample*

A study was conducted with a sample including  $n_1=118$  experts (professionals in the field of adult education) and  $n_2=152$  novices (students in the field of adult education) who participated voluntarily. Experts worked in various German adult education institutions, thus an institution bias can be excluded for the expert group. All subjects in the novice group studied adult education at the University of Regensburg, Germany. They have only little teaching experience through curriculum tasks or, in some cases, through a vocational teaching in youth organisations.

### *Instrument*

The study used a paper and pencil survey. The instrument was a standardised questionnaire derived from the Rational-Experiential Inventory (Epstein, Pacini, Denes-Raj, & Heier, 1996). The instrument contained the subscales *faith in intuition* and *need for cognition* referring to the *teaching domain* and *daily life*. A total of 28 items had to be answered using a 5-step Likert scale. An exploratory factor suggested five dimensions. The following five scales were constructed and used in further data analyses.

*Intuition in daily life.* This scale (Cronbach's  $\alpha = .78$ ) refers to intuitive decisions in daily life, e. g. spontaneous purchase decisions and general opinions (item example: "I am an intuitive person.").

*Teaching intuition.* This scale (Cronbach's  $\alpha = .56$ ) focuses on intuition in the domain of teaching, e. g. quick reactions on classroom events and spontaneous thoughts for teaching (item example: "First ideas for designing teaching often are the best ideas.").

*Rational analyses.* This scale (Cronbach's  $\alpha = .56$ ) aims at rational analyses of classroom situations which demand full awareness (item example: "I undertake efforts in analysing the situation in the classroom.").

*Search for control.* This scale (Cronbach's  $\alpha = .61$ ) refers to efforts for controlling and monitoring the activities in the classroom which require the subject's concentration (item example: "I dislike surprising situations in the classroom.").

*Search for structure.* This scale (Cronbach's  $\alpha = .55$ ) comprises cognitive efforts of finding frames and scaffolds in the perception of the classroom situation (item example: "I prefer tasks of clear structure.").

*Hypotheses*

The factor analysis led to one scale measuring daily life acting (scale 1), one scale measuring acting intuitively in the domain of teaching (scale 2), and three scales measuring acting rationally in the domain of teaching (scales 3, 4, and 5). Concerning the research questions (1) and (2) the following hypotheses were drafted.

- (1) Experts more often than novices act intuitively in teaching situations.
- (2) Experts put less effort than novices into rational analyses during teaching activities.
- (3) Experts make less effort than novices to control and monitor classroom activities.
- (4) Experts make less effort than novices to find frames and scaffolds in their perception of classroom situations.

Concerning the research question (3) the following hypothesis was drafted.

- (5) There is no significant correlation between intuitive acting in the domain of teaching and intuition in daily life.

*Analysis*

For answering research questions (1) and (2), which focused on group differences between experts and novices, a two-sided *t*-test for independent samples was computed on a  $\alpha = .05$  level of significance. For answering research question (3), Pearson's *r* was computed as correlation coefficient between the five scales.

**Results**

Table 1 shows descriptive results of the questionnaire, separated between experts and novices.

Table 1

*Descriptive statistics. M=mean, SD=standard deviation*

Scale	Number of items	Cronbach's alpha	Experts ( $n_1=118$ )		Novices ( $n_2=152$ )	
			<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
(1) Intuition in daily life	5	.78	3.40	0.68	3.63	0.67
(2) Teaching intuition	3	.56	3.09	0.80	3.21	0.72
(3) Rational analyses	6	.56	2.58	0.75	3.22	0.68
(4) Search for control	3	.61	3.49	0.65	2.76	0.73
(5) Search for structure	2	.55	3.75	0.73	2.97	0.79

Table 2 shows the results of the *t*-tests for independent groups, comparing experts and novices.

Table 2

*t*-test results for independent samples (two-sided tests,  $df=264$ ). *n. s.*=not significant

Scale	<i>t</i>	<i>p</i>
(1) Intuition in daily life	2.83	<.01
(2) Teaching intuition	1.30	<i>n. s.</i>
(3) Rational analyses	7.22	<.01
(4) Search for control	-8.48	<.01
(5) Search for structure	-8.23	<.01

Table 3 shows the Pearson correlations between all five scales.

Table 3

*Pearson correlations between the scales. \*\* $p < .01$ , \* $p < .05$  (two-sided)*

Scale	1	2	3	4	5
(1) Intuition in daily life	+	.39**	.13*	.15*	-.09
(2) Teaching intuition	.39**	+	.03	-.08	-.14*
(3) Rational analyses	.13*	.03	+	-.21*	-.18*
(4) Search for control	.15*	-.08	-.21*	+	.17*
(5) Search for structure	-.09	-.14*	-.18*	.17*	+

## Discussion

*Research questions (1) and (2): Do experts differ in the amount of intuitive / rational decisions in teaching situations?*

All theoretical models reported in this paper suggest that novices and experts differ in the amount of intuitive decisions, because experts dispose of a much higher amount of experience developed during their occupational biography (Gladwell, 2005; Hogarth, 2001; Klein, 2003; Myers, 2002). In the present study, this effect was expected to be strong, because the sub-sample of novices included students of adult education who did in most cases have little or no experience in teaching adults, whereas the group of experts was recruited from German public institutes of adult education and vocational education and training. The experts had teaching experience between one year and 36 years. Theory suggests that the experts in this study have much more capabilities to act intuitively than the novices. Concurrently, novices were expected to compensate the lack of intuition with a higher amount of rational decisions. In reporting the example introduced previously in this article, it was assumed that an expert applies intuitive decisions to use group discussion and reflection methods as soon as he perceives problems of understanding in the group of participants. A novice might wonder about the babbling in the group and try to

analyse reasons for this phenomenon. In other words, it was hypothesised that experts produce a larger amount of intuitive decisions, whereas novices produce a larger amount of rational decisions.

Empirical evidence contradicted the theoretical expectations in most cases. Hypothesis (1) suggested that experts would act more often intuitively in teaching situations than novices; this hypothesis clearly has to be rejected on the basis of the findings. The *t*-test indicates no significant difference between experts and novices (table 2), the means differ only marginally on 0.12, and both standard deviations are similar. These findings contradict the theoretical assumption connecting the capability to act intuitively with one's experience. However, the protagonists of intuition theories refer to other empirical evidence in field studies (e. g. Klein, 2003) as well as in laboratory tests (e. g. Tversky & Kahneman, 2002). Obviously more research is needed to explain the different findings. One can speculate about reasons for the discrepancy. It might be problematic to use students as novices, because their lack of expertise arguably might foster them to agree to statements like "I do act spontaneously during teaching." It might be, that they had so little experience that their answers were guided by social desirability and by speculations rather than by considering one's own behaviour. Some items referred to seminar participants (e. g. "I easily can judge seminar participants at first glance.") which possibly could have affected novices, who were students. Possibly they referred to their rich experiences from their university life when answering such questions.

Only hypothesis (2) could be confirmed. Indeed experts put less effort into rational analyses of the classroom situation than novices do. Due to experts' capability to act intuitively – that means that they just know how to act – they do not need to exert themselves for analysing incidents in the classroom. This is a substantial advantage compared to novices, because the classroom situation produces less cognitive load, and attention can be directed towards other processes. It is credible and plausible that experienced trainers and adult educators do not need much effort for their situational analyses. Instead, they have better opportunities for perceiving details in the classroom. This result nicely matches reports of experienced

school teachers that the analysis of the classroom conditions during teaching occurs casually (Berliner, 2001).

It is plausible that the results concerning hypothesis (2) have direct impact on the results concerning hypothesis (3), because consequently experts should make less effort than novices to control and monitor classroom activities. However, the opposite result emerged: Experts and novices differed significantly, but experts reported more effort than novices to control and monitor classroom activities. At first glance, this is a surprising result, in particular in combination with the confirmation of hypothesis (2). However, there are plausible explanations. Experts have ample experience and thus are able to perceive a much wider range of classroom activities. This perception probably is more appropriate and more differentiated than novices' perception. The result therefore might to be explained by experts' emphasis (and capability) on the perception of classroom activities, but not on efforts made in classrooms to perceive relevant processes. Videographing classrooms and using retrospective thinking-aloud instead of using written questionnaires might help to investigate this explanation.

Hypothesis (4) had to be rejected. In contrast to the expectations, the data indicate that experts made more effort to identify frames and scaffolds in their classroom perceptions than novices do. Again, this surprising result can be explained from a different perspective. Research on expertise suggests that experts in a given domain indeed assign their perceptions to patterns, but experts' patterns are of different quality (and size) than novices' patterns. The items used in the questionnaire did not have a level of resolution, however, which allowed distinguishing different qualities of patterns of perception.

Taken together, it can be argued that the unexpected findings can be explained by artefacts introduced through the use of the instrument. However, little research has so far been done to investigate the impact of different types of instruments for the analysis of intuitive decision-making. Possibly, the questionnaire used was not precise enough to exclude unintended interpretations, in particular in the expert group. Certainly, experienced adult educators perceive classroom activi-

ties and attribute scaffolds, but the instrument might have addressed these concerns to general. However, the general idea of the hypotheses in the present study had been that experts' processes run more implicitly, whereas novices' processes cost much attention. It has to be discussed whether the operationalisation of the theoretical models has matched the intentions.

*Research question (3): Is intuition a domain-specific phenomenon?*

Research on expertise clearly indicates that the capability to show high performance is domain-specific. Hypothesis (5) thus predicted small correlations between teaching intuition and intuition in daily life. However, table 3 shows that the highest correlation were found between intuition in daily life and teaching intuition. This contradicts not most theories of intuition and might suggest that intuition is a general tendency of acting. In contrast, most intuition theories follow a cognitive tradition referring to knowledge and processing of knowledge. Intuition therefore has been conceptualised as a domain-specific component of professional competence.

The significant correlation of considerable size ( $r=.39$ ) between teaching intuition and intuition in daily life, does not, however, allow to reject theories of intuition in principle. Rather the discrepancy allows to pose new questions about the nature of intuitive decision-making. Even if intuitive decisions in professional life result from domain-specific experience, their unconscious nature might well lead to the phenomenon that they are more easily transferred into daily life than rational processes. It is a difficult methodological (and theoretical) question how to adequately construct instruments that are capable to measure intuition in daily life. The idea that intuition is a moment of individuality that makes people act intuitively in general, does not contradict (or even reject) the assumption of domain-specific acting in the domain of teaching, including the hypothesis that teaching intuition is a feature of a specific professional domain.

## Conclusions

This paper first aimed to highlight the importance and relevance of intuition as a component of professional expertise in adult education. In discussing the theoretical state-of-the-art, different faces of intuition in the teaching profession were distinguished. Explanations based on cognitive aspects of intuition outline the knowledge base for intuitive decisions from a psychological viewpoint. The field of adult education so far is not a prominent research field. However, it is plausible to analyse adult educators from the perspective of research on expertise. Hence, the reported scientific approaches on intuition do not support negative connotations of intuition. Instead of denying high standards of intuitive professional acting, research on expertise rather supports the argument that intuition is a crucial element of professional competence and, thus, affects teaching quality.

A second purpose of this paper was to empirically test assumptions that were drawn from theory in order to enhance the understanding of professional adult education. The results of the study contradicted most expectations. In the discussion about the discrepancy, it was argued that new challenges arose concerning both theoretical assumptions and empirical methodologies. The present study thus can be seen as a first empirical attempt to contrast experts and novices in the field of adult education concerning their amount of intuitive acting, which produced questions rather than answers.

Certainly it would be premature to reject the theoretical assumptions on the basis of the findings of one single study. However, it is challenging to explain contradictory findings in different studies. Attempts have been outlined how to improve in future the instruments for assessing intuitive decisions. In the present study, the reliability of some scales was not satisfying. A further step forward could be to validate the instrument by comparing it with alternative instruments, both with different questionnaires like the Cognitive Style Index (Allinson & Hayes, 1996) and with qualitative methodologies like videographing or thinking-aloud techniques.

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