PILOTING VAKE (VALUES *AND* KNOWLEDGE EDUCATION) IN THE EDUCATION FOR PRACTICE OF NURSES[1]

Jean-Luc Patry*, Maria do Rosário Pinto, Ana Spínola***, Alcinda Reis******

*Full professor emeritus, University of Salzburg, Department of Education, Erzabt-Klotz-Strasse 1, 5020 Salzburg, Austria, jean-luc-patry@sbg.ac.at, ** Adjunct Specialist Professor, Polytechnic Institute of Santarém, Higher School of Health, Quinta do Mergulhão - Sra da Guia, 2005-075 Santarem, Portugal, mrosario.pinto@essaude.ipsantarem.pt,*** Adjunct Specialist Professor, Polytechnic Institute of Santarém, Higher School of Health, , Quinta do Mergulhão - Sra da Guia, 2005-075 Santarem, Portugal, ana.madeira@essaude.ipsantarem.pt, **** Adjunct Specialist Professor, Polytechnic Institute of Santarém, Higher School of Health, , Quinta do Mergulhão - Sra da Guia, 2005-075 Santarem, Portugal, alcinda.reis@essaude.ipsantarem.pt.

ABSTRACT

Imagine the following situation: You are a nurse for elderly people, going to the homes of your patients. A female patient tells you on our first visit after hospital discharge following a hip fracture surgery that she does not want to be at home, because she is not well enough to be alone and she needs therapy with oxygen in permanent basis until she recovers from a respiratory temporary infection situation.

This kind of situations is the starting point for an educational sequence that addresses both values (here: life, human dignity, respect, loneliness) and knowledge (different medical treatments, legal rules, etc.). The example shows how intensely interrelated the values and the facts are. Based on this example we introduce the constructivist didactical tool VaKE (Values and Knowledge Education) that permits to combine both issues, and present a pilot study using this method in the education of nurses.

[1] This project has been funded with support from the European Commission, project 543894-TEMPUS-1-2013-1-IL-TEMPUS-JPHES (Lifelong Learning in Applied Fields, LLAF). The Commission cannot be held responsible for any use which may be made of the information contained therein.

Results underline the significance of a structured discussion of values combined with knowledge integration, by applying VaKE, and emphasize the importance of incorporating personal experience into this reflexive approach. Likewise, motivation inherent to this strategy is highlighted by all participant due to the possibility of argumentation based on theoretical dimensions, but as well in previous life path and experience. The unformal conditions of the process, without an active and constant intervention of the teachers, was seen as a promoter of cooperation among students. Based on these positive experiences, it is suggested that further studies using VaKE in Nursing Applied Fields should be conducted.

INTRODUCTION

Nursing, whether in the hospital or extramural, is a very complex practice. The nature of this profession is marked by its scientific character, autonomous intervention in broad multidisciplinary contexts, in a dynamic of functional complementarity regarding the other healthcare workers and by its level of dignity and professional practice autonomy (PNO, 2009).

Nurses are expected to have health responses which imply interdisciplinary, multiprofessional dynamics and to have an intervention based on proximity, continuity and wholeness, which confers them a role as partners and mediators, when dealing with complex matters helping the individual, the family and the group, around their health project (PNO, 2009).

This requires high responsibility, need for consistent general knowledge about health care, and specialization in some fields. Nurses must deal with many different, very specific patient needs, and for this they must not only have the necessary technical and execution competences within health care, but also relational and social competences, along with a high autonomy and responsibility in the execution of their professional independent and interdependent work functions. Nevertheless, they have to manage the existing dependency on many stakeholders: patients; their families; the physicians they work with; peer nurses, beside the fact they are part of a hierarchical system, involving hospitals, the health care system, etc.

Academic professors of pre-graduation nurses need to take into account all these factors, inasmuch as higher education must maintain dynamics of permanent relevance and adequation to society needs and to the quality control of this offer (PNO, 2009), and these must not be dealt with independently but in relation with each other. How can we teach for such a complex profession?

In this paper we present a teaching method that can account at least for some of these factors simultaneously: Values *and* Knowledge Education (V*a*KE). It is not the only concept to be used in nursing education, but it is one that has been shown to be successful in many studies (see, for instance, Patry, Weinberger, Weyringer & Nuss-

baumer, 2013; Patry, Reichman & Linortner, in press). The present study is an attempt to see whether V*a*KE can be used in the education of pre-graduate nurses; it is a pilot study which is conceived to make first experiences with V*a*KE in this new area[2].

THEORETICAL BACKGROUND OF VALUES *AND* KNOWLEDGE EDUCATION (V*A*KE)

In teaching on all levels, from primary school to university, there is a tendency to clearly separate knowledge education from values education. Knowledge education addresses the content, subject matter, etc., while values education deals with the students' moral stance. While occasionally values are addressed in specific disciplines in relation to the content, typically the values issues are taught in special courses or curricular units like "nursing ethics", where, for instance, the fundamental basics of ethics, moral and deontology, professional values, codes of ethics are discussed and ethical-deontological problems associated to nursing care are analysed.

Although it is accepted that nursing is a moral activity and that ethical reflection requires practitioners to think critically about their values and to ensure that these values are integral to the care that they provide in every interaction (Quallington, 2012), the focus of teaching is more on knowing about responsibilities and the codes of ethics, and not so intensely on the nurses' personal values judgments, even if values are viewed as "what is important, worthwhile and worth striving for" (Horton, Tschudin & Forget, 2007, p. 717) and define who we are as individuals, while conversely the society, culture, morals and beliefs impact on how individual personal values are defined (ib.). Personal values are accepted as inherent to human life, seen as attitudes, beliefs and priorities that bind individuals together and guide behaviour (LeDuc & Kotzer, 2009), and some authors acknowledge that personal values can influence the nurses' professional behavior (e. g. Ingersoll, Witzel & Smith, 2005; Hammell & Whalley, 2013).

Given the complexity of the profession and the responsibilities of the nurses, it seems necessary that the pre-graduated nurses are convinced of the appropriateness of the rules and values taught in the courses, through a reflected and discussed process that enables them to rationalize personal and professional values within the process of care, pursuing the achievement of the recognition that they all have similar values and share the same goal of improving patient care, otherwise they will not apply them adequately.

In such a context if makes perfect sense to integrate the V*a*KE methodology. In V*a*KE, the knowledge part and the values part of the education are combined and related to each other. It is a constructivist teaching approach based on discussing

[2] The pilot study took place in the Higher School of Health of Santarém, from Polytechnic Institute of Santarém, Portugal, one of the Consortium Members of the project LLAF.

moral dilemmas, i.e., short stories in which a protagonist has to take a decision with opposing values at stake; the values discussions trigger interest in the necessary *knowledge base*, which is then searched by the students (e.g., in the internet). Based on this newly acquired knowledge, the values at stake in this dilemma can be discussed on a higher level. The more knowledge the students have acquired, the more elaborate their argumentation becomes, and the more the moral discussion is, the more the students need information.

The theoretical base is given in figure 1. The general framework is *constructivist*, which means that all concepts a student learns are considered as being constructed by the learner (e.g., Putnam, 2008) through integration into pre-existing subjective theories (*assimilation* sensu Piaget, 1976) or, if this does not work (disequilibrium), through adaptation of the subjective theories (equilibration through *accommodation*, Piaget, 1976). This is done with respect to knowledge acquisition – this is studied, for instance, in the research progams on *conceptual change* (e.g., Vosniadou, 2013). Similarly, *moral judgment development* occurs through assimilation and accommodation (Kohlberg, 1984): When confronted with moral arguments that do not fit into ones argumentation pattern according to one's respective stage, repeated accommodations lead eventually to the next higher stage. Finally, assimilation and accommodation are socially mediated; this is our interpretation of Vygotsky's (1978) *social constructivism*. To these fundamental theories, *applied theories* addressing practical educational strategies have been developed: For knowledge acquisition, one practical application is *inquiry learning* (see, for instance, Reitinger, 2013; Reitinger, Haberfellner, Brewster & Kramer, 2016). For moral and values education, dilemma discussions (Blatt & Kohlberg, 1975) are a possibility. One practical approach of social constructivism is *collaborative learning* (e.g., Harding-Smith, 1993). These three practical educational strategies are *combined* in V*a*KE. In our research on V*a*KE, we have noticed that there are many *other theories* that are relevant, although they were not used in developing V*a*KE.

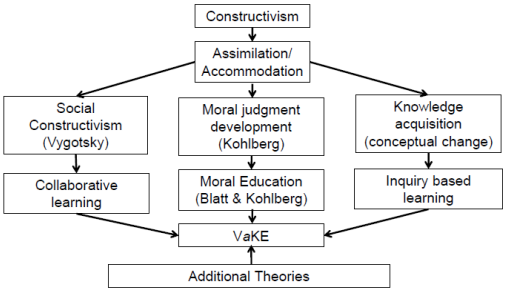

Figure 1: Theoretical background of V*a*KE

The results of the many studies using V*a*KE can be summarized as follows (see, for instance, Patry, 2012a; Patry et al., 2013; Patry, Reichman & Linortner, in press; Patry, Weyringer, Aichinger & Weinberger, 2016):

- In control group experiments (typically using the cross-over design) it was consistently shown that the students with V*a*KE know at least as much as the students of the control group, but often know even more than the teacher had known before the V*a*KE unit.
- Students' knowledge after V*a*KE is on a higher level in the Bloom taxonomy than after traditional teaching.
- Students are highly motivated and interested.
- In V*a*KE, the students address both justice as well as care in their dilemma discussions, in contrast to Kohlberg's (1984) focus uniquely on justice issues.
- V*a*KE-students' gain in moral competence as well as their gains in discursive problem solving behaviour are much higher than those of students of traditional teaching.

These are just a few of the results found with V*a*KE. They suggest that V*a*KE might be an appropriate tool for the education for professions like nursing. In the present pilot study this should be studied in a prototypical context.

PROCEDURE

In the present study, the following moral dilemma was used:

> Michael is a nurse taking care for elderly people, going to the home of his patients; on the first visit after her hospital discharge, he is confronted with a female patient, Maria, who doesn't want to be at home, because, as she says, she is not well enough to be alone (she is dependent on other people for doing her life activities due to a hip fracture recovery) and she needs therapy with oxygen in permanent basis until she finishes recovering from a respiratory temporary infection situation, prescribed to be done at home.

In a first meeting, the story was enriched with details suggested by the students so that it became authentic in the sense of being at least partly self-created. The dilemma was constructed with the mobilization of students' previous experience. From this, a dilemma was identified: Should Nurse Michael provide conditions for Maria to stay at home? Or, on the other hand, should he not provide conditions for Maria to stay at home, but should he rather orient her to an institution where she can be cared for? The participants were seven 3rd year students with five previous moments of clinical interaction for a total of 34 weeks. The practical setting was an internship in Family Health according to the Calgary Model (Wright & Leahey, 1994). One tutor for all students was involved.

In table 1 the minimal steps of a prototypical V*a*KE process are given. These were applied in the present study as follows: *Preparation and clarification* (0): If it is the students' first experience with V*a*KE, they need to be prepared since most of them are not familiar with open teaching and the freedom it provides. Thus, they were informed about the principles of V*a*KE (including the steps it consists of) and the discussion rules. In the second meeting, the final version of the *dilemma was introduced* (1), and the students were invited to *vote* (2), resulting in four votes in favour

and three against fulfilling Maria's wish to return to an institution. This vote was taken with the students knowing very little and based on their common knowledge; it was the first opportunity to recognize that they should base their decision on more facts. In the following *dilemma discussion* (3; Blatt & Kohlberg, 1975), several values emerged: Family; social interaction and risk of isolation; dependency vs. independency; autonomy; importance of patient safety and personal wishes. As preconized, the discussion led to further questioning.

The following *questions* were raised (4): How to provide safe oxygen administration at home? Do applicable legislations or guidelines for non-technician home support in home oxygen monitoring exist? If so, what are they? What are the social and economic dimensions like personal costs for the family of the treatment? Is there a possibility to integrate Maria in a Continuous Care facility after discharge from hospital? What does the legislation say? The *search for information* (5) was conducted individually during one week. Each student agreed to search about all subjects. The leading question for this step was: "What do I need to know to have an effective argumentation of my position?" The teachers shared some information considered crucial, mostly from studies about the practice. The information sources included scientific and non-scientific information, with the obligation to use EBSCO and B-On scientific databases and to validate the information acquired. The *information was shared* (6), first, within the small group of two or three students. Before the next group meeting, students were asked to elaborate a synthesis of the information that supported each students' perspective. In the group meeting, first, the two respective groups of students who initially had the same opinion exchanged information, then the whole group shared the acquired information.

The *second arguments* (7) started without any teachers' structuration, but spontaneously organized by the students. The professional knowledge mobilization was very preeminent at the start, by means of the normative-legal framework of the nursing profession (Order of Nurses' directives and national legislation). The ethical principles and deontological dimensions were discussed as well. Then the importance of feelings associated with the situation presented and the difficulty students have in separating personal feelings and moral values from professional practice emerged. From this moment on, values discussions dominated the interaction and the students centred themselves on the importance of personal previous experience mobilization into decision making: from the professional point of view (two of the participants), but predominantly from each personal path in life; as students' emphasize, these are moral and values centred perspectives.

In the *synthesis* (8), the importance of an effective global professional assessment as a background for clinical decision making was pointed out, along with the updated knowledge on guidelines and the health care specific legislation. Further, respect for the patient and her family, her autonomy and wishes, the importance of social and personal oriented values were outlined by the students. There was no repetition (9), so no new synthesis (10) was necessary. In the *generalization* (11), the students were asked in a final survey to reflect on the V*a*KE strategy and give their opinion about the importance for academic and personal skills acquirement and development.

Table 1: Minimal steps in a V*a*KE process; *italics: values education*

	Step	*Action*	
0	*Preparation and clarification*	*Students' understanding of values; abilities in the working techniques; rules of interaction*	*Class*
1	Introduce dilemma	Understand dilemma and values at stake	Class
2	*First decision*	Who is in favour, who against?	group
3	*First arguments (dilemma discussion)*	Why are you in favour, why against? Do we agree with each other? (moral viability check)	group
4	Exchange experience and missing information	Exchange of arguments; what do I need to know further to be able to argue?	class
5	Looking for evidence	Get the information, using any source available!	group
6	Exchange information	Inform the other students about your constructions; is the information sufficient? (content related viability check)	class
7	*Second arguments (dilemma discussion)*	Why are you in favour, why against? (moral viability check)	group
8	*Synthesis of information*	Present your conclusions to the whole class (moral and content related viability check)	class
9	*Repeat 4 through 8 if necessary*		group/class
10	*General synthesis*	Closing the sequence capitalizing on the whole process	class
11	*Generalization*	Discussion about other but related issues	group/class

RESULTS

The general conditions of the discussions were seen as crucial by the students. They emphasized the importance of incorporating personal experience into the reflexive approach. The opportunity to integrate their personal perspective at the beginning of the discussion, without a previous theoretical background, is pointed out by all the participants as an interesting opening slant, motivating them to continue intervening in the argumentation. This was visible in the first discussion with respect to the patient's autonomy by two students with opposing opinions:

I agree because my mother always told me: When you were a baby I had to work, so you were at a nursery. When I'm old, it is fair that you put me on a nursing home.

I disagree because the family is supposed to take care of the elderlies. When my grandmother was sick, everyone joined forces to be present, after work, school, and my father stayed at home.

In a more sophisticated and meta-cognitive way, similar ideas were expressed in the second discussion:

We always take a bit of ourselves when we explain something to people.

The general feeling was summarized by one of the student as follows:

I felt heard. What I was saying meant something, even without mentioning an author to support what I was saying.

Likewise, the importance of confronting themselves with different lived experiences and personal accomplished opportunities was underlined as motivating, with emphasis on the unformal conditions without an active and constant intervention of the teachers. This cooperation among students could also be seen in them recognizing the need for mutual support to find more information.

The teachers' roles were seen as different from traditional reaching. They guided the discussion during the first argumentation, but this was not sensed as such traditional teaching by the students. The questions the teachers posed and their comments were seen as pertinent, but not as coming from a *teacher*, but rather from a peer, i.e., from a person of the same level, and the arguments had the same relevance as the remarks from the other students. The method fostered the spontaneous willingness to search for more information, "*so we could prove our perspective*", as on student expressed. In their search for information, sources were accessible. The acknowledgment of the importance to search for credible sources of information was not a new strategy for the students: "*To that, we are already prepared! We already know that every word has to be supported by an author!*" Sharing results in the large group made them read information that supported their perspective. Yet they also read meaningful information that was against their viewpoint.

Moral values are frequently discussed within their regular learning environment, but V*a*KE gave it a central position throughout the process. This was identified as very important due to the different significations students' acquired during the process, which transcend the theoretical ones, strongly linked to Nurses' Deontological Code. An example is the following statement: "*We have the duty to respect one's autonomy and wishes".*

According to the teachers at the Higher School of Health, self-learning strategies are current in the professors' daily teaching practice. But those involved appreciated the participation, enthusiasm and interest of the students. The students' characteristics, like socio-cultural background, lived experience, maturity, levels of knowledge and self-confidence, were seen as more important and valued in the V*a*KE discussions than in the traditional approaches.

The personal and professional gains mentioned by both teachers and students addressed particularly the impact on the future caring perspective and the high relevance to be implemented on learning environment in nursing bachelor degree.

Overall, these findings are in line with the results of previous experiences, conducted in different scientific areas, levels of graduation and students' characteristics. One result, however, confirms informal experiences but has not yet been expressed so explicitly in previous studies: The students underlined that understanding a person's values does not change ones' own values, but allows more empathy to the views and

values of others. This is important because it shows that V*a*KE not necessarily changes the participants' identity but fosters the understanding of the perspective of other people, even if they do not have the same opinion. And it seems to us that this is an important condition for tolerance in general and for patient-specific care in nursing in particular.

DISCUSSION

In a pilot study like the one described here, it is not possible to assess all variables that might be regarded as relevant. It must be underlined, however, that this study was part of a general research program. The TEMPUS project Life-Long Learning in Applied Fields, within which this study was embedded, is part of this research program addressing issues of college learning for professional practice. The other studies within this project (e.g., Linortner & Patry, 2015; Patry, Costa & Monteiro, this volume; Patry, Reichman & Linortner, in press; Pnevmatikos, Patry, Weinberger, Linortner, Weyringer, Eichler-Maron & Gordon-Shaag, 2016) confirm these results and extend them in the sense discussed above. And this project is an extension of the general research program on V*a*KE, as documented, for instance, in Patry et al. (2013). This means that the results that were reported are a confirmation of previous studies. In other words, they are not unique, but quite representative for results found generally with V*a*KE.

The combination of scientific and personal perspectives and of descriptive and prescriptive issues through V*a*KE led the students to gain a different look at the patients' situations. They could emphasize with the patients' needs and see that the "technical" issues are not all there is in nursing. The importance of "*talking with the heart*" was recognized, and capitalizing on personal previous experiences "*makes us feel we can be people while caring*".

A second crucial issue was the possibility to express a "non-theoretical" opinion, i.e., one's knowledge even if it is not recognized as scientifically viable. This accounts for the complexity of the nursing situation, in which the scientific theories provide only an insufficient foundation for practical decision-making (see, for instance, Patry, 2012b); instead, the practitioners have to rely strongly on their personal estimation of the requirements of the practical situation. This is the more the case if these situations have an antinomous character (i.e., are moral dilemmas), as in the stories used to start the V*a*KE processes. And this antinomous character is typical for many nursing situations, for instance when one considers the patients' needs and wishes but cannot comply fully with them because of the medical requirements. Therefore the question arises how much leeway the nurse has with respect to these requirements. The legal regulations underline the importance of the nurses' responsibility and autonomy, with which the nurse can comply only if all available knowledge, including personal perspectives, are taken into account.

The participants' motivation in the V*a*KE process was particularly notable. This motivation was visible in their engaged participation in the discussion, in their interest

in the issues that were addressed, even in their excitement about the story and about the discussion. The glow of the students' eyes was visible.

It seems that on one hand, the approach could indeed address at least some of the issues mentioned in the introduction that characterize the profession of nurses in its complexity, and on the other hand, that the commitment and motivation of the participants was high, thus ascertaining successful learning. Maybe these two features are linked, since learning for a profession is likely to be the main motivation of the students, and V*a*KE satisfies this need. However, motivation goes beyond the pure professional interest. It seems that the emphasis put on the personal background, including the participants' own biographies as some of the statements suggest when they refer to the experiences in their own family, plays an important role in this regard.

As a pilot study, the experience was encouraging. It is suggested that further attempts using V*a*KE in teaching prospective nurses should be undertaken, providing opportunities to continue developing a person-centered learning culture. This was highlighted by this experience, focusing on personal growth and enhanced self-awareness, both for students and professors.

REFERENCES

Blatt, M. M., & Kohlberg, L. (1975). The effects of classroom moral discussion upon children's level of moral judgment. *Journal of Moral Education, 4*(2), 129-161. DOI**:** 10.1080/0305724750040207

Hammell, K., & Whalley, R. (2013). Occupation, well-being, and culture: Theory and cultural humility/occupation. *The Canadian Journal of Occupational Therapy, 80*(4), 224-234.

Horton, K., Tschudin, V., & Forget, A. (2007). The value of nursing: a literature review. *Nursing Ethics*, *14*(6), 716-740.

Ingersoll, G. L., Witzel, P. A., & Smith, T. C. (2005). Using organizational mission, vision, and values to guide professional practice model development and measurement of nurse performance. *Journal of Nursing Administration*, *35*(2), 86-93.

Kohlberg, L. (1984). *Essays on moral development: Vol. 2. The psychology of moral development*. San Francisco, CA: Harper & Row.

LeDuc, K., & Kotzer, A. M. (2009). Bridging the gap: A comparison of the professional nursing values of students, new graduates, and seasoned professionals, *Nursing Education Perspectives, 30*(5), 279-84.

Linortner, L., & Patry, J.-L. (2015). *Teaching manual, module 1: VaKE-Tact – Values and Knowledge Education and Agogical Tact*. Salzburg, Austria: Unpublished paper, Life-Long Learning in Applied Fields (LLAF), Project 543894 – TEMPUS-1-2013-1-IL-TEMPUS-JPHES, Group 4: Learning to Be.

Madeira, A.C. (2015). *Nursing student in the process of care in clinical education*. Saarbrücken, Germany: Novas Edições Acadêmicas.

Patry, J.-L. (2012a, June). Values and Knowledge Education (VaKE): Experiences with a means to achieve the double assignment. Keynote Presentation at the Third Symposium of the EARLI SIG 13 (Moral and Democratic Education) "Building ethical schools and teaching practices", Bergen (Norway), June 18, 2012.

Patry, J.-L. (2012b). Der Pädagogische Takt. In C. Nerowski & S. Rahm (Hrsg.), *Enzyklopädie Erziehungswissenschaft Online*. doi: 10.3262/EEO09120250

Patry, J.-L., Reichman, R., & Linortner, L. (in press). Values *and* Knowledge Education (V*a*KE). To be published in H. Vidergor and O. Sela (Eds.), *Innovative teaching strategies and methods promoting lifelong learning in higher education: From theory to practice*. Happauge, NY: Nova Science Publishers.

Patry, J.-L., Weinberger, A., Weyringer, S., & Nussbaumer, M. (2013). Combining values and knowledge education. In B. J. Irby, G. Brown, R. Lara-Alecio & S. Jackson (Eds.) and R. A. Robles-Piña (Sect. Ed.), *The handbook of educational theories* (pp. 565-579). Charlotte, NC: Information Age Publishing.

Patry, J.-L., Weyringer, S., Aichinger, K., & Weinberger, A. (2016). Integrationsarbeit mit eingewanderten Jugendlichen mit V*a*KE (Values *and* Knowledge Education). *International Dialogues on Education: Past and Present. IDE Online Journal, 3(3),* 123-139. http://www.ide-journal.org/article/2016-volume-3-number-3-integrationsarbeit-mit-eingewanderten-jugendlichen-mit-vake-values-and-knowledge-education/

Piaget, J. (1976). Piaget's theory. In B. Inhelder & H. H. Chipman (eds.), *Piaget and his school: A reader in developmental psychology* (pp. 11-23). New York: Springer.

Pnevmatikos, D., Patry, J.-L., Weinberger, A., Linortner, L., Weyringer, S., Eichler-Maron, R., & Gordon-Shaag, A. (2016). Combining values and knowledge education for lifelong transformative learning. In E. Panitsides & J. Talbot (Eds.), *Lifelong learning: Concepts, benefits and challenges* (pp. 109-134). New York, NY: Nova Science.

[PNO] Portuguese Nurses' Order (2009). *Strategic plan for nursing education 2008 /2012*. Lisbon, Portugal: DPI Cromotipo. [ISBN: 978-989-96021-5-1]

Putnam, H. (2008). What makes pragmatism so different? In M. U. Rivas Monroy, C. Cancela Silva & C. Martinez-Vidal (Eds.), *Following Putnam's trail: On realism and other issues* (pp. 19-34). Amsterdam, The Netherlands: Rodopi.

Quallington, J. (2012) *Ethics, values and the role of the nursing student. Nursing 2012 and beyond.* Available on http://www.rcn.org.uk/__data/assets/ pdf_file /0005/445217/Eth-ics,_Values_and_the_Role_of_the_Nursing_Student_Jan_Quallington.pdf (accessed January 2017).

Reitinger, J. (2013). *Forschendes Lernen. Theorie, Evaluation und Praxis in naturwissenschaftlichen Lernarrangements*. Kassel: Prolog.

Reitinger, J., Haberfellner, C., Brewster, E., & Kramer, M. (eds.). (2016). *Theory of inquiry learning arrangements. Research, reflection, and implementation*. Kassel: Kassel University Press. http://dx.media.org/10.19211/KUP9783737601450

Vosniadou, S. (ed.). (2013). *International handbook of research on conceptual change, second edition*. New York, NY: Routledge.
Vygotsky, L. S. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.
Wright, L. M., & Leahey, M. (1994). The Calgary family intervention model. In L. M. Wright & M. Leahey (Eds.), *Nurses and families, a guide to family assessment and intervention. 2nd ed*. (pp. 99-129). Philadelphia, PA: Davis.