Studia Kinanthropologica, IX, 2008, (1), 13-17
The Scientific Journal for Kinanthropology

CONCEPTION OF PHD STUDY IN EDUCATIONAL BRANCHES: SOME VIEWS OF THE US EXPERIENCE*

KONCIPOVÁNÍ PHD STUDIA V PEDAGOGICKÝCH OBORECH Z POHLEDU ZKUŠENOSTÍ V USA

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ABSTRACT

Author suggests that the overall conception of doctoral study in educational branches, partly related also to the PhD study in kinanthropology / kinesiology / sport science, should be clearly conceptualized as a preparation of new scientists. Contemporary curricula of Bachelors as well as Masters study create insufficient preliminary background for such an approach. Problems of a similar kind can be found in the educational streams of study also in the USA, nevertheless, competent institutions in the USA are initializing steps and measures, which are supposed to bring a positive change. A fundamental point consists of incorporating a first background of scientific methodology into Bachelors as well as into Masters curricula so that the further PhD study might continue on this preliminary background. The main purpose of this process is seen in reaching the same scientific level of PhD study in educational branches and other disciplines, such as natural sciences etc.

Keywords: education, doctoral study, kinesiology, kinanthropology, sport science, physical education, science teaching, teachers education

SOUHRN

Pojetí doktorského studia v pedagogických oborech, zčásti se dotýkajících studia odborníků v kinantropologii, by mělo být jasně koncipováno jako příprava nových vědeckých pracovníků. Dosavadní pojetí v pregraduálním (Bc) studie i magisterském studiu k tomu vytváří nedostatečné předpoklady. Podobné problémy se vyskytují i v pedagogických oborech v USA, kde k tomu v posledních letech zaujaly státní instituce stanovisko podporující změnu. Základem je včlenění příslušných částí vědecké přípravy už od bakalářské a masterské úrovně, aby začínající PhD studium mohlo navázat na určitou základní úroveň a nezačínalo od elementární přípravy. Cílem je přivést doktorské studium v pedagogických oborech na srovnatelnou úroveň s ostatními obory.

Klíčová slova: vzdělávání učitelů, doktorské studium, kinesiologie, kinantropologie, sportovní věda

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On the "scientifically based" research in education, and kinanthropology

Physical education as a teaching subject in the Czech Republic is, however, accredited in a form of a university branch for preparing students in the frame of education at several Schools of Education / Faculties of Education in their Departments of Physical Education under the recognized discipline called Kinanthropology. It is a scientific branch that bears the signs of interdisciplinarity, transdisciplinarity, and a use of wide spectrum of various empirical research methods, and its core tends partly belong to behavioral sciences (Blahuš 1993, 2004b, 2005). In the area of educational research the clashes of quantitative vs. qualitative approaches and the related "methodolatry" seem to be nowadays more or less peacefully transformed, including our kinanthropology, physical education, or sport science (whatever name being used) - Brannen 1992, Hendl 1997). Hopefully, the solution of these problems are moving toward

**článek byl zpracován v rámci řešení a za podpory grantu VZ MSM 0021620864*

Critical Methodology (Slife & Gantt 1999, Yanchar etal. 2005, etc.), and rigorous scientific evidence.

It may be interesting to notice what streams stimulated by contemporary problems in educational and behavioral sciences are mirrored in the area of educational research in some foreign countries. I would like present couple of remarks from the recent situation in the USA. As an example let us have a look at materials as "Resolution on the essential elements of scientifically-based research" (AERA 2003), or even govermental legal documents as "Education Sciences Reform Act" (ESRA 2002) stating "scientifically-based" education research standards whose nine features I quote a little abbreviated:

1. Objective methodology for reliable and valid knowledge relevant to education activities
2. Presentations and claims that are appropriate to and supported by the methods employed
3. Employing systematic empirical methods that draw on observation or experiment,
4. Involving data analyses that are adequate to support general findings,
5. Relying on measurements or observation methods that provide reliable data,
6. Making claims of causal relationships only in random assignment experiments - or other designs to the extent such designs substantially eliminate plausible competing explanations
7. Ensuring that studies are presented in sufficient detail to allow for replications,
8. Using research design and methods appropriate to the question posed,
9. Be open to critique, acceptance by peer-reviewed journals or by a panel of independent experts

Since I cannot find some of my own points among these institutionally claimed criteria let me paraphrase the nine features by mine, even if there is a certain overlap:

An empirical research is to be theory laden (Blahuš 2004a). It must be hypotheses-falsification oriented (in the sense of the Popper´s philosophy of science), with the hypotheses pursuing one or a couple of theoretical paradigms, which they had been derived from. The confirmatory and exploratory approaches in the empirical research are to be balanced according to the area specificity, but mostly a blind exploratory approach should be avoided.

The theoretical paradigms (specifically focused theories) have to consist of a network of structured hierarchy of explanatory theoretical concepts (constructs), which are interconnected with their empirically observable standardized research variables (indicators) by theoretically explicated rules of correspondence (they are ").

For observation or data collection, the empirical research variables have to be standardized, i.e. their "diagnostic quality" is to be verified and known in advance. This is exhibited in the form of standardization indices, and characteristics, e.g. coefficients of reliability, different types of validities etc.

In part, the problematic of standardization also covers appropriate logical construction of research variables, their categorization and appropriate way of data coding with respect to representation measurement theory and the theory of data. In experimentation, an experimental design must be based on the known basic logic rules to allow for some possibility of supporting possibly causal inference about treatment-effect relationships in controlled randomized experiments.

If statistical methods of data analysis were applied, the blind use of statistical significance and null-hypothesis testing should be abandoned in favor of interpreting the scientific content significance (importance, practical significance) and size of effect that should be tentatively stated in advance as a part of the specific research hypothesis. The only two exceptions are inferential statistical projects: (i) representative survey study of randomized sample from a clearly defined population that is to be generalized on, and/or (ii) a controlled randomized experimental design. (Cf. Thompson 1996).

Combination of different methods and general methodological approaches, say triangulation, quantitative and qualitative research approaches, should be everytime used.

However statistical methods might seem to be used extensively in educational research and kinanthropology in the Czech environment there are at least the following groups of statistical methods that did not get enough attention: Structural Equation Modeling (SEM), Multidimensional Scaling (MDS), the so-called "psychometric" methods should become a general theory of diagnostic quality with Item Response Theory (IRT), Generalizability Theory, reliability, and so on.

The changing conception of PhD curricula in education in the USA

Recently, a similar problems as in our kinathropology are under discussion in the U.S.A. That era dates from more than a decade ago, cf. Sarason 1993, Schoenfeld 1999 etc. It is analyzed in the graduate schools, and in the bodies related to the problematic of doctorates in educational, behavioral, and other fields:

- Carnegie Foundation (cf. Essays on Doctorate, Richardson 2003, Hyman 2003),
- National Science Foundation (NSF 2004),
- American Association of Colleges of Nursing (AACN 2001),
- AERA – American Educational Research Association (see many references in the list below, especially in the Educational Researcher journal)

- Department of Education, Institute for Education Sciences (IES 2004).

Especially, the last item above, which represents main official office analogous to a section of Ministry of Education in European countries, means a substantial change in the policy of the recently reorganized instiute, which appears under the new name. The new approach to the graduate study and doctoral degree has been introduced personally by the Institute´s new director showing the stress on "preparing future scientists" (Viadero 2004).

Suggestions for a future policy

It seems that a principal change and turn should be made by improvement of the contemporary state of affairs, especially with respect to the future development of kinanthropology and its position and recognition among the other behavioral sciences. We have to implement the standard "scientific culture" into the educational academe, especially in, and starting with, the preparation of the PhD´s. It means implementation of norms of the "scientific culture", and to educate the fresh graduate students for the socialization to the principles of scientific inquiry, to the general scientist´s mission. Just for instance, among the norms and principles we may find the personal focusing on proving scientific laws and regularities contrary to just "testmanship", data gathering from "grabbed" samples, blind laboratory instrumentation or so. Further, it means using and referring results with the empirical instruments, tests, questionnaires etc., of known and verified diagnostic quality, i.e. validity, reliability etc. Also, it includes socialization to scientific critique, preparedness to be open, confront, and accept different methodological approaches, opinion, various interpretations from colleagues and peers with the view that the purpose consists of maximum possible level of scientific prove of a hypothesis, which means maximum self-critical hesitation about its falsifiability. Etc.

Probably, the main point at all is that the graduate studies, on MA / MS and especially on the PhD level, should be explicitly conceptualized as preparation of new scientists.

With PhD study in kinanthropology we are facing a specific problem as compared to natural sciences like physics, chemistry, geology, biology, etc . Namely, our Master graduates are typically prepared as future Phys-Ed teachers or sport coaches, thus, Master graduate study is primarily a preparation of experienced practicionaires. There fore, on this intermediate level of graduation, the forthcoming PhD´s are not getting enough scientific background. Partly, and in a certain sense, it might lead some people and the public to consider the PhD in Kinanthropology as "professional doctorate", like M.D., or J.D.

By my experience in academic administration I know that similar problems are also found in other branches. For an instance, have a look at clinical medicine: How much a medical doctor, say a surgeon, knows about adequately planned experimental design ... .

What is crucial here is the necessity of early orientation of the future PhD candidates - it means their preliminary orientation on research in pregradual and lower graduate levels. The "scientifically talented" bachelor students should have a specific and officially by curriculum recognized opportunity to be involved in a scientifically-oriented projects and get credits for that. Too, on the masters level the central attention and amount of courses should be based on sicentific methodology, not on many diversified subjects The same applies to the doctoral level where too many subjects / courses that are not research-oriented may be just extending or even repeating the Masters curriculum. Actually, it seems to me that there are too many successful teachers, even university teachers, who are coming after years without any research experience and applying for admission to extramural PhD study just as a "cap stone" of their pedagogical career.

Bachelor level suggestions:

- Methodology of research should be a compulsory part of bachelor curricula, covering basic general methodology, research design, statistics, methods of logic, overview of principles of some selected formal and mathematical methods.
- A special preliminary scientific stream of bachelor study, starting the end of the last-but-one year plus the last one (usually end of 2nd plus the 3rd), should allow a specialization in a research type program completed with a smaller research thesis even on this bachelor level.
- Thus, already on the bachelor level the preparation and selection of "scientific talents" would start.

Masters levelsuggestions:

- A separate master level program should be especially oriented as a scientific preparation, specifically focused on the further PhD continuation..
- The other ("standard") master programs should be coordinated with the above-mentioned and allow for some mobility of students, especially those who would exhibit the deep scientific interest and capability.
- A cooperation with other departments and colleges within the university as well as across international cooperation with other branches of scientific disciplines would be supposed to prepare the masters students in specific interdisciplinary branches of kinanthropology.

PhD level suggestions:

- Any PhD program / curriculum should contain a compulsory, say two-year courses, of:

(a) general methodology of research and research design, (b) overview of modern formal methods used in behavioral sciences, (c) one or two specific formal methods training.

- Specific interdisciplinary programs of PhD study should be especially promoted and supported, and carried out in bi-, tri-lateral cooperation with the other departments whose primary orientation is to formal methods (say artificial intelligence, information theory, ...).

- Research program and the possible interdisciplinary formal method application should be interrelated and compared to the corresponding applications in the behavioral branches outside the kinanthropology / sport science.(Publishing in scientific journals outside kinanthropology should be highly demanded.

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