Univerzita Karlova | Fakulta tělesné výchovy a sportu

Evaluation of doctoral dissertation – candidate: **Lukáš Chmelíř**

Title of the dissertation: ***Assesment of Individual Game Skills of Ice Hockey Players on the Example of Puck Control***

External reviewer: ***Prof. Jean Lemoyne***

General comments: I have to congratulate the candidate for the substantial efforts that were put to make this doctoral thesis an important contribution to the field. Therefore, the present study showed the complexity of the sport, but at the same time show how it could be organized in objective ways of performance assessment.

In general, the thesis is well written, and the reading is agreeable. The line of thought is congruent from the start, and I really appreciate the way the document is structured. I will send an annotated version of the thesisthat could be used by the candidate and his supervisor.

Each part of the thesis is well organized, despite that I think that some minor points need to be addressed in the formal aspects of the text (see below).

1. Relevance and timeliness of the research topic

- This thesis projects address a relevant topic of interest in the field of sport education, especially ice hockey in Czechia. In fact, ice hockey is the national winter sport of this country and this doctoral thesis showed the necessity of finding ways to help stakeholders-coaches to develop young hockey players. Due to the complexity of the sport, the project contributed to structure an approach designed for assessing the stage of development of young players.

- As stipulated by the candidate, the interests and relevance of finding ways of quality assessment in organized hockey needs to be developed furhter. However, it also need to be put in context – <u>in this regard I think that some part of this aspect could be improved during the defense.</u>

Problem statement – rationale of the study
<u>Question 1</u>: Could the candidate present with more clarifications the different types of sport development model in which we could identify more clearly the different stages of development, from 6 to 17 years old ? I recognize that such aspect is introduced briefly but I think it could be used in the discussion for example.

Question 2: Why suggesting the development of an assessment method? What is the popularity of tice hockey in Czechia, and what are the actual challenges in teaching hockey across this country? Maybe some numbers about membership, sport attrition, main challenges with maintaining children into the sport. I think such kind of information could support more strongly the need of improving assessment methods in the sport.

- The relevance of taking a specific skill like puck control is correct (and strongly supported) and important in the context of learning to play hockey. This is well justified, and I agree with the choice of skills. However, I would like to see the candidate's perspective for assessing other skills a different stages f development.

Question 3: Based on a specific sport skill development point of view, I am interested to see which skills should or might predominate at each stage of development. For example, the explanations form pp. 16-17 could have been replaced with a summary table.

2. The adequacy and rigor of the methods and procedures used

I congratulate the efforts of explaining with many details the methodology. This is a strength of this project. This is also congruent with the expectations of a doctoral thesis. The use of stages seems appropriate, but I think Stage 1 is a pilot phase and might take this appellation.

I am less familiar with IRT and Rasch modeling, so my critical point of view will be more limited. However, I must admit that this section is strongly developed. The only point that I think that might improve the section is to use some sport science examples.

Some specific observations here, that might be clarified:

- P21: Excellent explanation i=of the IRT method. However, I would appreciate some examples form the sport science field (if there are).

- P22, P23: excellent description of the procedures behind IRT and Rasch.

- P24: the characteristic curve: I think that adding some figures and tables could be good additions.

- P38: on what rationale were based the hypotheses? Can the candidate specify some previous work on which the expected results are based?

- P41 and P43: N of participants need to be justified, in regard with statistical power calculations.

P43: Setting standards: This aspect remains a little unclear to me. I am fully understanding the procedure, but I still question the relevance of assessing U7 players in terms of puck control. Why is it necessary to do it, as for youth hockey players, the incentives should be based mostly on enjoyment of the sport and not too much on sport specialization?

Question 4: As the development of skills start from physical literacy (Whitehead, 2010), how do you feel that such testing protocol can contribute to enhance children's physical literacy?

3. The scientific merit and originality of the results, particularly those that may be considered novel contributions to the field

Excellent work in this regard (+++). The scientific merit behind this work is substantial. The amount of work in terms of preparing the protocol and collecting data shows the important implication of the candidate in his doctoral project. As supported by a narrative review on the topic, the results that emerged from this project are original and new to the field. Hopefully they will serve as inspiration for future work.

- Despite its relevance, I feel that some details are lacking in the first part of the project – the literature review. The results from this review remain vague, and a more detailed presentation of the procedures (ex. Prisma or PiCOT methods) might have been considered. For example, why not illustrating the full procedures of literature review by showing the real numbers that came from the literature review methods (ex. How many physiological papers, etc.)?

  Question 5 (as a point for general discussion): I totally agree that almost no literature exists about hockey skills testing. Considering the complexity of ice hockey, one publication (not mentioned in the review) suggest more global approach for testing young hockey players (muli skills circuit). Based by an example like the suggested lecture below, I would like to know the candidate's position about more global protocols.

  https://thesportjournal.org/article/measuring-ice-hockey-skills-in-a-repeated-measures-testing-context-the-effects-of-fatigue-on-skating-efficiency-passing-agility-and-shooting/

- Results from the 2nd and 3rd of the thesis constitute the strength of the dissertation. Elaboration of the protocol was done with high rigor, and I feel that the results that emerge from this work are strong – with high validity. The statistical analyses are well explained and the fact of going through multiple rounds of analyses led to a strong model for assessment of skills. Congratulations for this!

- Results in regard with the 3rd objective are interesting. They suggest a sequence or progression of 17 exercises, which is interesting in practical terms. However I have some questions, especially in line with the summary of the "standards" section.

  Question 6 (in regard with standards):

- Is the puck control protocol too demanding or too difficult to assess young players skills ? Maybe next research should consider taking account for players' level of competition, as a proxy measure for expertise (despite their age group).

- I think it is necessary to consider the federation age group cutoffs. If this is the case, maybe this should be specified in the methods.

4. The formal and linguistic quality of the thesis

- The thesis is well written. I do not see major flaws or modifications that need to be addressed. However, two points raised my concerns:

- (1) In the first part of the thesis many paragraphs are short separated by short sentences – I think they should be a bit longer paragraphs.

- (2) I suggest the use of figures and tables, especially in the first part of the thesis and in discussion in which some summary results should be presented.

- References – they are presented in a good manner, respecting APA norms.

- P20. LANGEDORFER is in capital letters: please correct.

5. The potential impact of the work on the development of the discipline and its applicability in practice

    - The contribution of this thesis as many practical implications and I think the candidate provide some good suggestions for coaches and stakeholders. I wonder if it is possible for the candidate to identify what are the key research to prioritize in this filed for the upcoming years?

      Question 7: As the young players were tested can the candidate discuss briefly on how factors such as relative age effect could play a role in players' results in the puck control protocol?

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Final recommendation:

1. I confirm that, to my evaluation of the thesis, this dissertation meets the standards required for the award of the Ph.D. degree in accordance with the Study and Examination Regulations of Charles University,

2. I also recommend that the candidate should be allowed to proceed to the final defense.

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