

## Opponent's Review on the Doctoral Thesis

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<b>Degree programme</b>	<b>P 8206 Visual Arts</b>		
<b>Degree course</b>	<b>8206V102 Multimedia and Design</b>		
<b>Mode of study</b>	<b>Full-time</b>	<b>Acad. Year</b>	<b>2016/2017</b>
<b>Thesis Title</b>	<b>An Investigation into Shoe Style for Prevention of Heel Pain</b>		
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The thesis at hand is a result of keen effort of a young student whose objective is to use his professional experience and knowledge in designing proper footwear for people with foot problems and help them suffer less. The structure of the thesis is set up logically and properly. Appendix 9.3. clearly shows that thesis was processed over a considerably long period of time with all formal requisites, such as e.g. researcher training, gathering theoretical background, collecting data through survey, carrying out experiments and measurements, prototyping, remaking and improving prototypes. The chain of activities was well prepared and carried out with enthusiastic approach that lasted for almost four years. All this adds weight to trustworthiness and professional level of the thesis. Also, the list of the author's diplomas and certificates confirms his devotion to the topic.

1<sup>st</sup> chapter introduces sources of author's motivation and his major goals. It also mentions major types of research methods and thus really creates a good information fundament for the topic to come.

2<sup>nd</sup> chapter starts the specific topic itself. It theoretically focuses on two main subjects of the thesis "a foot" and "a shoe". Foot anatomy is briefly described and major foot disorders are listed to provide a general picture of the extent of the health problems the author is trying to tackle. Chapters 2.5-2.7. show the author's extensive theoretical background and understanding of the shoe construction. They correctly pick up most important properties and features of the product and give the reader clear idea in which direction the upcoming survey and design and material development will be directed. My own professional

experience confirms the chapters' conclusions concerning the major factors that influence the comfort and foot health in the shoe:

- shoe upper materials – stretchy, breathable, adjustable (natural or synthetic)
- insoles and inserts – helping to maintain natural foot position and pressure allocation
- fitting – resulting from the last shape, cut of the shoe and applied upper material

3<sup>rd</sup> chapter deals with the survey performed. The survey initially included a long list of questions that after a pilot study had to be divided into sections to be more easy-to-understand and interesting for the respondents. This can be considered a reasonable solution as the amount of data to have been collected was quite ambitious. The number and variability of the questions resulted in rather extensive statistic data output with complicated structure but revealed important information about respondents' foot problems, footwear habits and preferences. As the most valuable and commercially useful message I consider the information on the willingness of people with foot problems to pay higher amounts of money for orthotic shoes recommended by specialists. At the same time the survey discloses the sad fact that affected people do not have access to proper information neither on the foot problems nor on footwear. Generally, the survey was another good starting point for further development of specialized footwear.

4<sup>th</sup> chapter summarizes measurements performed on real human feet. The results confirm the widely known endless variability of human feet size and shape that brings complications to shoemakers when producing products for patients. Nevertheless, the tolerable allowances are defined in the chapter that along with suggested upper materials, cuts and fastening complement the mosaic necessary for development of specialized footwear.

5<sup>th</sup> chapter utilizes knowledge gathered in the previous chapters. Information from the surveys and measurements is transformed into another survey more focusing on finding an ideal shoe suitable for a majority of patients with foot problems. By means of repeated questioning and testing, 3 prototypes are defined (including material, cut, fastening, sole, etc.), produced and tested with positive feedback from patients as well as podiatrist specialist. The drawings and computerized designs are included, nevertheless, the authentic images of real prototypes could provide readers with more specific and tangible impression of the prototypes. The design framework involving a great number of stakeholders (orthopaedic doctors, nurses, podiatrists, designers, shoemakers, material specialists, etc.) presented at the end of the chapter outlines 3-stage process of designing shoes for patients with foot problem. This theoretically accomplishes the author's goal "contribute to providing or improving heel pain patients' foot health condition through the provision of appropriate footwear" (p. 21) which is undoubtedly noble. However, romantic motivation gets often lost

in today's business driven world. The commercial point of view is mentioned in chapter 6.11. however, the conclusion to involve government or non-government organizations and try to achieve "supplying appropriate footwear free of charge or at a subsidized rate" (p.128) seems a distant reality.

According to available information the group of people affected with foot problems is expected to grow from 285 million now to 438 million by 2030 (p. 20). Surprisingly, the level of knowledge about heel pain, foot care and use of appropriate footwear among patients and also among foot doctors (podiatrists) is low. The thesis shows what types of footwear sold for what amounts of money could help solve health problems of patients in the Czech Republic. At the same time, it reveals that selling price of developed prototypes would not be acceptable in the market as poor people most often cannot afford to pay the price (p. 128). Healing patients presents enormous costs for insurance companies. So, shall we focus on designing and producing healthy footwear or raising awareness about possible foot problems, proper footwear and prevention? Of course, both. A good idea that is missing in the thesis is to create a kind of social movement and involve insurance companies and commercial organizations into preventive campaigns as sponsors (similar as take place for breast cancer or similar). Investments into raising awareness about foot problems and proper footwear could reduce the costs for specialized footwear production, insurance companies and thus contribute to fulfilling the author's goals – to reduce suffering of people.

## Evaluation

The greatest benefit I see in the thesis is that it homogenously presents the topic of health problems and their relation to footwear type and material. The performed survey, measurements and prototyping provide valuable information for specialized shoemaking companies that focus on production of diabetic footwear and can lead to making their production more suitable and available to end users. What I lack in the work is more business insight. Commerce-related information is only mentioned but plays a key role for bringing the good ideas from the thesis into life.

Nevertheless, to all my comments, reflexions and suggestions I recommend to evaluate and to accept candidates work.

Bc. Rudolf Dittrich

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