

OPINION

on Implementation of the Individual Research Plan and the Doctoral Student`s Artistic, Scholarly, Organizational, and Teaching Activities

Doctoral Student: Mikołaj Durka

Doctoral dissertation Supervisor: prof. dr hab. Monika Karwaszewska

Prepared by: dr hab. Grzegorz Wieczorek

Mr. Mikołaj Durka, MA, has been enrolled in the Doctoral School since October 2023.

Based on the documentation describing the scope of the research undertaken, as well as the progress in the implementation of the Individual Research Plan, I can conclude that the doctoral student demonstrates diligence, reliability, and consistency in his scholarly, organizational, and teaching activities.

The research topic undertaken by Mr. Mikołaj Durka has been defined under the working title: 'Understanding the principles of the Construction and Functioning of Wind Instruments'. The doctoral student seeks to determine whether the material from which instruments are made has an influence on their sound. To the best of my knowledge, this is the first attempt in Poland to approach issues related to the design and construction of wind instruments from a scientific perspective.

The absence of the luthiere traditions in wind-manufacturing field in Poland is a remarkable phenomenon, particularly especially since post-war Poland was home to piano manufacturing factories, while workshops producing string instruments and guitars have achieved a high level of craftsmanship and enjoy an excellent reputation both nationally and internationally. It is all the more encouraging that Mr Mikołaj Durka has undertaken the challenge to fill the void and has chosen to develop his practical expertise through his work at ZM Concept. In his capacity as a technician and Head of the Service Department, he does not limit himself to the repair and maintenance of instruments, he also implements his own innovative ideas, aimed at launching the production of clarinet barrels as well as mouth pipes and tuning slides for trumpets. To the best of my knowledge, attempts to manufacture clarinet barrels as well as trumpet mouth pipes and tuning slides have previously been undertaken in Poland. Mr. Dariusz Koziół, who worked at the Intrada Wind Instrument Service Center in Kielce, produced his own clarinet barrels. However, his experiments and modifications focused mostly on the design of the barrel`s internal bore, while the influence of the material itself was not taken into consideration. Moreover, these activities were not conducted within scientific research framework. Instead, the manufacturer relied largely on the subjective assessments and playing experiences of musicians using his products.

Taking into account the scope of the research and the progress documented in the report on the implementation of the Individual Research Plan, I can conclude that the results obtained by the doctoral student are highly promising. The continual refinement and modification of

the research methods employed reflect Mr. Mikołaj Durka`s diligence, methodological rigor, and very good theoretical preparation.

Of particular importance is the academic supervision provided by Professor Monika Karwaszewska. Her assessment of the candidate`s work is highly positive and her reports offer a detailed evaluation of project components and the degree to which they have been accomplished. This level of supervision has largely contributed to systematic and effective development of the research project.

Furthermore, the opinions and recommendations of numerous distinguished clarinetists and trumpeters attest to the quality of Mr. Durka`s products. The substantial number of professional musicians participating in the testing process reflects the growing recognition of his work and enhance the credibility of the research being conducted.

Personally, I had the opportunity to attend presentations and lectures delivered by the doctoral student during two editions of the International Clarinet Workshops in Koszęcin, as well as at the International Festival Gdańsk Clarinet and Saxophone Days 2024. On each occasion, Mr. Mikołaj Durka presented the objectives and assumptions of his research in a clear, structured, and accessible manner.

He outlined the current state of knowledge in the field and discussed the positions adopted by other researchers, while at the same time he emphasized his own distinctive and innovative approach to the question of how material composition influences the sound quality of wind instruments. He presented the results of his experiments using charts, graphs, and multimedia tables, all accompanied by thorough commentary that reflected a deep understanding of the subject matter.

His fluency and confidence as a speaker, combined with his command of clear and elegant Polish language, attest to his high level of intellectual and professional maturity.

Taking into account the documentation provided by Mikołaj Durka and a very detailed opinion of the supervisor prof. dr hab. Monika Karwaszewska, I assume there is no need to enlist all activities of doctoral candidate. I have no hesitation in conclude that the level of implementation of he Individual Research Plan is exemplary. The progress exceeds the original assumptions of the project and provides strong belief that the research will be successfully completed, making a significant and original contribution to the field of wind-instrument craftsmanship in Poland.

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Wrocław 27.06.2025

OPINION

The subject of the doctoral dissertation is an investigation into the influence of the material used in the manufacture of wind instrument accessories particularly clarinet barrels and trumpet mouth pipes – on the sound characteristics of these instruments. The dissertation working title is:

‘Understanding then Principles of the Construction and Functioning of Wind Instruments’ and concerns the issue of influence of internal geometry, bore profile, material density, and specific gravity on the acoustic properties of wind instruments.

Particular attention in the doctoral student’s research is devoted to clarinet barrels, which since the late 20th century have increasingly been considered – alongside the bell – as interchangeable components of the instrument. Yet, before that time, the barrel as well as the bell were viewed as parts of the instrument’s main body and therefore as an integral, non-interchangeable components of the instrument. In recent years, there has been marked growing interest in clarinet barrels manufactured from alternative materials, various wood species, novel shapes and new types of rings. Initially, the production of these experimental barrels was undertaken by mouthpiece manufacturers and small-scale instrument-making workshops mainly in the USA and Canada. Today, this trend has encouraged amateur craftsmen, hobbyists, and instrument technicians to produce these accessories on a large scale. While these products are visually attractive, their tonal and acoustic merits are often uncertain and remain questionable. Such accessories give rise to a range of problems related to intonation, sound production, and tonal projection. For this reason I regard Mr. Durka’s research, which has the potential to systematize knowledge in this area and shed new light on these issues, which have become a platform for commercially driven activities of not grounded nature, unsupported by rigorous research or sufficient theoretical foundation. Mikołaj Durka intends in his doctoral project to disseminate of the research results both through a patent application and through scholarly publications, including a comprehensive and rigorous presentation and discussion of the findings obtained.

The student’s diligence and dedication are beyond question.

The doctoral student’s reliability and conscientiousness are best reflected by the opinion of prof. dr hab. Monika Karwaszewska in the survey on supervisor-doctoral student cooperation prepared as part of the mid-term evaluation process:

During the preparation of the Individual Research Plan, the doctoral student demonstrated both substantial subject-matter knowledge and high organizational skills, planning the activities included in the doctoral training programme in a purposeful manner. Particular courses, such as ‘Patents and Trademarks: Practical Aspects of Filing Results with the Patent Office and the European Union Intellectual Property Office’ and ‘Musical Acoustics’, were selected especially to provide direct support for the student’s conceptual work and to facilitate the fulfilment of the formal requirements connected with both the IRP and the doctoral dissertation.

The implementation of the IRP has proceeded in accordance with the established schedule, confirmed by the annual evaluations prepared on the basis of the student`s progress report. Throughout the process, the doctoral student has maintained regular consultation with the supervisor and has consistently accepted the comments, recommendations, and guidance provided, incorporating them into the ongoing development of the research project.

Having considered all of the above, I am fully convinced that Mr. Mikołaj Durka`s doctoral dissertation will represent a substantial and methodologically robust contribution to knowledge, demonstrating a high level of subject-matter expertise, and fulfilling all the essential standards of academic research. The incorporation of a patent into the doctoral student`s research outputs reflects the practical applicability of his work, emphasizes the interdisciplinary character of the doctoral project and provides the foundation to collaboration between the academic research and the musical instrument industry.

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OPINION

on the progress and achievements of Mr. Mikołaj Durka in the implementation of his Individual Research Plan during the first half of his doctoral education
at the Doctoral School of Stanisław Moniuszko Academy of Music in Gdańsk.

Supervisor: Professor Monika Karwaszewska

I have established this opinion on the basis of the documentation provided to me, comprising:

- Mr. Mikołaj Durka`s Individual Research Plan;
 - the doctoral student`s reports for Semester I, II, III and IV, as well as the reports on the implementation of the IRP during the first two years of doctoral studies;
 - the supervisor`s opinion regarding the progress achieved in the implementation of the IRP to date;
 - questionnaires concerning cooperation between the doctoral student and the supervisor, and between the supervisor and the doctoral student, prepared as part of the mid-term evaluation process;
 - the article On the Influence of Material on the Sound Characteristics of Wind Instruments, published in the monograph *Woodwind Instruments: Sources, Performance Practice, Instrument Making, and Musical Creativity* (Stanisław Moniuszko Academy of Music Press, Gdańsk, 2024);
 - a description of the listening tests conducted to investigate the possible influence of the material from which a clarinet barrel is made on the sound characteristics of the instrument;
 - the record of teaching practice;
 - documentation and a list of conference presentations, including letters of appreciation from the conference organizers.
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- list of institutions with which the doctoral student collaborates;
 - 17 testimonials from professional musicians concerning the original modifications made by the doctoral student to their instruments;
 - a certificate confirming the completion of a study visit to Engelbert Schmid GmbH in Mindelzell, Bavaria.

Mr. Mikołaj Durka has devoted his doctoral research to the study of wind instruments, with particular impact on the possibilities for improving their quality, including sound characteristics, playing comfort, and the individual adaptation of instruments to the needs and expectations of musicians. The working title of the project, as stated in the Individual Research Plan (IRP), *Possibilities for Influencing the Physical Properties of Wind Instruments*, is extensively broad in scope and allows the doctoral student to focus on selected cases of particular research interest.

According to the project description contained in the IRP, the research is concerned primarily with structural components of clarinets and trumpets. Depending on the outcomes of these investigations, it will be considered to extend the research to additional instruments from both the woodwind family (bassoon) and the brass family (French horn and trombone).

The anticipated outcomes of the project cover the development of original structural solutions for selected components of wind instruments, as well as a doctoral dissertation in the form of a collection of thematically related scholarly articles. Given the extensive scope of the research, this format represents a well-considered and appropriate choice.

Undertaking such a broad research topic, from which emerge highly specialized issues such as the design of an innovative clarinet barrel, the construction of an original trumpet model, and numerous smaller yet significant inventions, would not have been possible without the doctoral student's professional training and experience in instrument maintenance and construction acquired prior to commencing studies at the Doctoral School.

The documentation demonstrates that the candidate undertook doctoral studies motivated by a desire to deepen his practical skills and the accompanying knowledge, with the aim of providing a scientific foundation for his creative and inventive activities in the field of wind-instrument construction. The programme outlined in the Individual Research Plan (IRP) is multidimensional and carefully designed. It encompasses not only the essential components of doctoral-level education but also activities in the line with the student's individual needs arising from the chosen research topic and the scope of the planned work. These activities include scientific experiments, the design and construction of original components for musical instruments (including inventions potentially eligible for intellectual property protection), educational and community-oriented activities, and inquiry into the specialized language and conceptual framework through which musicians express their artistic perceptions and performance-related needs.

Particularly noteworthy is the fact that, alongside topics aimed at acquiring practical craft-based qualifications in instrument making and conducting scientific measurements and investigations into the physical properties of materials and sound, the doctoral student has recognized the importance of subjective assessments of instruments and their tonal qualities. He therefore undertook research into the terminology and conceptual apparatus employed in communication between musicians and instrument makers.

The surveys originally planned for this purpose expanded, during the development of a new clarinet barrel design, into a highly rigorous pilot study examining subjective evaluations of clarinet tone when using barrels manufactured from different wood species. The experiments described enabled the selection of the most appropriate methodology for assessing the influence of instrument material on sound characteristics. The decision to continue the research using this method should be regarded as well founded.

Considering the key function of listening evaluations in substantiating the doctoral thesis, the dissertation should include a detailed description of the methodology employed, including the conditions under which the test recordings were made, the characteristics of the expert

panel, the conditions under which evaluations were conducted (listening environment, loudspeakers, headphones, etc.), the design of the tests, and sample response forms. More extensive documentation of the listening experiment than that provided in the pilot study would facilitate, in accordance with the standards of empirical research, future verification or falsification of the findings.

In the case of advanced research based on listening assessments, it is believed important to conduct properly designed spectral analyses of the sounds produced by the instruments under investigation. Such analyses may assist in formulating conclusions, yet not expecting to provide definitive answers. Owing to the multidimensional nature of subjective evaluations, they are not always fully reflected in standard measurements of the physical properties of sound.

Conclusion

The extensive and comprehensive documentation demonstrates the doctoral student's impressive level of activity, systematic and carefully planned work, and highly encouraging results achieved thus far in the fields of wind-instrument modification and personalization. Mr. Durka benefits from the support of his supervisor and a carefully selected group of lecturers and tutors who are specialists in disciplines essential to the development of the doctoral project.

The first two years of study have proceeded in full accordance with the Individual Research Plan, as confirmed by the supervisor's assessment. They have resulted in significant achievements, including the further advancement of the student's artistic and craft-based competencies, the acquisition of knowledge concerning the protection of inventions, and substantial methodological progress in the scientific research being conducted.

Valuable scholarly publications, intensive engagement within the musical community, a strong awareness of instrumentalists' needs, educational initiatives, and ambitious plans aimed at establishing the foundations of a domestic tradition of master-level wind-instrument manufacturing award Mr. Durka's work with an additional significance extending well beyond the academic sphere.

All tasks established in the Individual Research Plan are being carried out systematically, and the numerous activities undertaken in the areas subject to evaluation are thoroughly documented. Together, they present a coherent and harmonious picture of a well-conceived doctoral project. This fully justifies a positive assessment of Mr. Mikołaj Durka's progress to date in the Doctoral School of the Stanisław Moniuszko Academy of Music in Gdańsk.

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Professor Barbara Okoń-Makowska