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Analysis of Evaluation Criteria for Thesis

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The article addresses the problem of raising thesis quality. The authors specify what scientific research is, determine its peculiarities, introduce the evaluation criteria for thesis and provide a list of reviewers.

Key words: search, thesis, evaluation criteria for thesis, Dissertation Council, Dissertation Council's Commission, external reviewer, opponent.

At present, many scientists working on thesis are involved in development of new materials (nanomaterials); biofuels and lubricating oils for internal combustion engines; polymers for repair of tractors, cars, and harvesters; new crop varieties. A great number of scientists conduct research in the spheres of seeds encapsulation, plant production and technologies, intelligent systems for automatic and automated process control. However, it seems that more attention should be paid to environmental issues in order to ensure sustainable development for prosperous life today and in future.

Laser technologies are widely applied in surface hardening and annealing treatment, surface alloying and embedding in glass, developing different types of coating, improving welded joints. Ultra-high frequency apparatuses are used in the treatment of sick animals, milk and crop processing.

In any study field, there are many developments to make people's life prosperous.

The objective of scientific research is a comprehensive study of the object, process, or phenomenon, their structure, connections and relations by means of scientific methods and with appropriate devices and equipment applied. In addition, scientific research aims at obtaining and implementing the outcomes, which will contribute to society [1, p. 79].

Scientific research, in contrast to other types of investigation or testing, should always be topical, consistent, systemic, comprehensive, reliable, and unbiased, should provide evidences, be complete and reproducible. These aspects are related to the evaluation criteria for thesis [2, p. 384-385].

The research issue is considered topical if the society is interested in this research outcomes and their implementation. Therefore, it is essential to prove that the research is feasible, timely, preferred or desirable. In terms of economy, the investigation conducted can have customers, whose demands are directly connected with the research results and who are ready to implement research outcomes in their production. The topicality should be based on policy documents, economic and industrial plans, scientific trends and demand forecasts, as well as grants awarded by different funds [3].

The research is regarded as consistent if the high-quality outcomes can be obtained in a way which is less time and effort consuming than others. For instance, based on the previous research one can propose an issue and prove its topicality, determine research direction, subject, object, aim, objectives, theoretical foundation, testing methods and techniques, and also the place or area, where the outcomes will be implemented. Considering the relevant published materials, the scientist can formulate a scientific problem or task and suggest a hypothesis. Following the way described above, one reaches the aim of the research in a manner that is less effort-consuming.

The research is characterized as systemic when a scientist, over a whole period of study, takes into account as many as relevant factors as possible. The thesis is complete when the research outcomes are implemented; there are recommendations on how the results should be used or how the research can be continued in future, with a particular direction determined.

Logics is particularly important when scientists analyze theoretical and experimental data obtained in the course of the research. It is also essential when writing conclusion. The question "why did it happen?" is less important than the question "what is the relation between cause and effect?", in other words, the scientist should reveal the essence of the process or phenomenon. It is obvious that the results obtained should be proved.

"Learning without thought is labor lost; thought without learning is perilous" – Confucius.

The research results are comprehensive if the author indicates the conditions under which the results were obtained, a parameter space, operational modes, etc. All this is particularly important for project organizations involved in relevant devices and technologies production.

For the research results to be reliable and unbiased, the scientists should stick to indisputable and commonly accepted scientific doctrines, national and international, widely-known and widely-applied techniques, programmes, GOSTs and OSTs, cutting-edge devices and equipment, including those designed in the course of the research. It is also crucial to conduct a sufficient number of tests, secure concordance between theoretical proposals and experimental data, provide well-grounded conclusions, and make sure that there is no contradiction between the results obtained and the relevant data provided by independent sources. Every scientist should implement the research outcomes in educational process or production, participate in diverse scientific and practical conferences (and the reports containing reviews of research outcomes should be approved), and publish papers in the open press and peer-reviewed journals and issues recommended by VAK (the State Commission for the Academic Degrees and Titles). Research outcomes implemented in production are commonly regarded as unbiased.

Research results should always be reproducible in order to be discussed and verified. This means that one should indicate the methods and techniques applied in the course of the research, as well as describe testing conditions

Based on the research conducted, one can prepare candidate's or doctoral thesis, as well as research report. The evaluation criteria for thesis are unified and given in the Regulation on conferment of candidate's or doctoral degree passed by the Government of the Russian Federation, dated September 24, 2013, no. 842 (Regulation), GOST 7.32-2008 Research report. Structure and submission guidelines, GOST R 7.0.11-2011 Thesis and authors' abstract, GOST 2.105-95 Unified system of engineering documentation. The organization where the thesis was prepared and the organization-external reviewer, as well as the Dissertation Council's Commission, the opponents, the Dissertation Council are to check whether the text submitted meets general requirements to text documents, reviewers of author's abstract and research report, Scientific-Technical Council of the department (laboratory) and Scientific Council of the Institute.

Table 1 shows the evaluation criteria for thesis and author's abstract review.

The data in the table indicates that the quality of thesis, as well as reliability of research results, are thoroughly monitored. However, some thesis and author's abstracts still have limitations, which deteriorate the value of research outcomes and decrease the qualification level of the authors. The typical limitations are as follows: inaccuracies in thesis title; inappropriate aims, subject and

Table 1. Evaluation criteria for dissertations

Evaluation criteria	Organization		Dissertation Council's Commission	Opponent	Dissertation Council	Author's abstract review
	where thesis is prepared	external reviewer				
1	2	3	4	5	6	7
Theme, P. 23			+		+	+
Topicality, P. 23			+	+	+	+
Theoretical statement as scientific accomplishment, P. 9			+		+	+
Solution for scientific problem, P. 9				+		+
Well-grounded technical and other development solutions, P. 9			+		+	
Solving tasks significant for development of the relevant field of study, P. 9			+	+		+
Providing new scientifically-verified technical and technological solutions and developments, P. 9				+		+
Written by the author independently, P. 9	+					
Consistency, P. 9, P. 10					+	+
Providing unique research outcomes for the relevant field of study, P. 10				+	+	+
Author's personal input in science, P. 16, P. 25	+					+
Data on implementation of research outcomes, P. 10		+				+
Giving recommendations on implementation of research outcomes, P. 10			+			+
Evaluating the research outcomes in comparison with other well-known solutions and providing supporting arguments, P. 10			+	+	+	+
Publication of key research outcomes, P. 10, P. 25		+		+	+	+
Number of papers published in peer-reviewed journals, P. 13				+	+	+
References to the sources of the borrowed materials, P. 14				+	+	+
References to papers prepared individually and (or) in co-authoring, P. 14				+	+	+
Reliability degree of the research outcomes, P. 16, P. 23	+			+	+	+
Scientific novelty and practical relevance, P. 16, P. 24, P. 25	+				+	+
Significance of scientific work, P. 16	+			+	+	+
Correspondence between the thesis and the field of study, P. 16, P. 18	+			+	+	+
Completeness of the information provided in papers published, P. 16	+			+	+	+
Feasibility of scientific statements, conclusions, and recommendations provided by the thesis, P. 23				+	+	+
Meeting the criteria for thesis provided by the Regulation, P. 1, P. 23				+	+	+
Meeting the deadlines for placing announcement on defense in the Internet and thesis and author's abstract on the official site of the Dissertation Council, P. 1	+					

1	2	3	4	5	6	7
Following the regulations on thesis submission and defense, P. 26	+					
Verified and well-grounded conclusion and recommendations, P. 23				+	+	+
Significance for science and practical usage, P. 10					+	+
Literacy of thesis and author's abstract (GOST 2.105-95)					+	+

object of study; poorly revealed topicality, scientific novelty, practical implications, and results reliability; absence of or improperly executed documents proving implementation; clumsy conclusion; numerous spelling, syntactical, and stylistic mistakes (failing to comply with GOST 2.105-95). In general, about 40–50% of the submitted thesis fail to meet the criteria [4, p. 2356–2357].

It is for the Higher Attestation Commission (VAK) to decide whether particular thesis and author's abstract meet the relevant criteria.

Table 2 provides the reasons why the Higher Attestation Commission (VAK) does not approve the solutions of the Dissertation Councils on awarding candidate's and doctoral degrees in different sciences [5, p.1-2; 6, p.3; 7, p.4; 8, p.5; 9, p.6; 10, p.11; 11, p. 10; 12, p. 11; 13, p. 12; 14, p.13; 15, p.14; 16, p. 15; 17, p.16]:

- not meeting the deadlines for placing the thesis and author's abstract on the official website of the organization, in which the Dissertation Council is, and announcement on thesis defense on the official website of the Higher Attestation Commission (VAK), P. 26 of the Regulation – 10 degree-seeking applicants (45.4%);
- borrowing materials without references to the author and (or) source, P. 14 of the Regulation – 5 degree-seeking applicants (22.7%);
- upon the application of the degree-seeking applicant, P. 38 of the Regulation – 3 degree-seeking applicants (13.7%);
- fail to meet the criteria for thesis, P. 1 of the Regulation – 3 degree-seeking applicants (13.7%);
- inaccurate information on scientific publications provided in the author's abstract, P. 11 of the Regulation – 1 degree-seeking applicant (4.5%).

When interviewed, degree-seeking applicants claimed that thesis and author's abstract submission guidelines have never been explained to them. Scientific supervisors and consultants also support this statement.

More often than not, papers and guidelines considering thesis preparation provide information on how to choose the topic, make a plan, work with literary sources and choose the methodology, conduct theoretical and experimental investigations, etc. They neither suggest proper nor give examples of wrong titles, do not describe how deeply investigated an issue is, do not provide enough evidences of the novelty and reliability of research, etc. Therefore, at present, there is an urgent need in introducing the discipline "Methodology of thesis development and preparation" into post-graduate programmes. Post-graduate students do need manual providing examples on different parts of thesis, which do meet the criteria applied. Currently, one can hardly find a thesis which would meet 75–80% of quality requirements.

Table 2. Deprived scientific degrees: fields of study (2014–2015)

Field of Study	Paragraph	Doctor of Sciences (number)	Candidate of Sciences (number)
Law	1, 14, 38	3	
Philology	1	2	
Biology	11	1	
Medicine	26		5
Physics and Mathematics	26		1
Economics	14		4
Pedagogy	26 38		2 1
History	38		1
Technical Sciences	26		2
Total:		6	16

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