

REVIEW

by **Prof. Dr. Anastasia Milanova Bankova,**

member of a Scientific jury for defense of dissertation

(Order of the Rector of Sofia University “St. Kl. Ohridski” –

RD 38-462/ 26. 07. 2022)

on the topic: “ **Technology Entrepreneurship among Bulgarian STEM Students: the Role of the University** ” for awarding the educational and scientific degree "**Doctor of Science**" in scientific field 3.7. Administration and management

to **Desislava Ivanova Yordanova**, Faculty of Economics and Business Administration, Sofia University “St. Kl. Ohridski”

(the defense will take place on 30-th of September 2022)

I. Overall assessment of the applicant.

I know Prof. Desislava Yordanova as a student, doctoral student and colleague at the Department of Business Administration, Sofia University “St. Kliment Ohridski”. Desislava Yordanova is creative, well organized, has clear priorities, based on which she sets goals for herself, which she relentlessly follows. Desislava Yordanova demonstrates an excellent management of her life - both personal and career, with which she cannot fail to make an impression and which I highly appreciate. She is an active researcher, who publishes the results of her works in prestigious journals, a valuable consultant, participant in international scientific events and a member of professional organizations.

II. Evaluation of the dissertation.

The presented dissertation for the awarding of the academic degree "Doctor of Sciences" has the following topic: "Technological Entrepreneurship among Bulgarian STEM Students: the Role of the University". The subject fully meets the official requirements for such an academic degree. In addition, Prof. Yordanova has also fulfilled all formal requirements of LDASRB, as well as the requirements of the university and the faculty, she is registered in NACID. At the very beginning, I want to point out that the summary presented by the candidate is excellently organized, which almost makes the presentation of the work by the reviewers unnecessary. However, the requirement must be met and the presented results confirmed. The dissertation is written in English, and the summary is presented in Bulgarian and English. It meets the requirement of being a more extended than usually when the dissertation is written in a language other than the Bulgarian language.

a. Technical characteristics of work.

The presented dissertation on the topic "Technological Entrepreneurship among Bulgarian STEM Students: the Role of the University" was developed in a volume of 342 pages - about 400 standard typewritten pages, 261 pages of main text, 50 pages of bibliography, 31 pages of appendices. Structurally, the work contains an introduction, 4 chapters and a conclusion. The work is illustrated by 22 figures and 52 tables. The list of information sources contains 470 titles, primarily in Latin, and the few publications in Cyrillic are included with the names of the authors in Latin and the titles – translated in English or in Cyrillic and are integrated into the general list.

The number of the author's publications on the topic of the dissertation is sufficient and presents her work to the scientific community to the required extent - 14 publications (a chapter of a collective monograph, journal articles and conference reports printed in their books of works). In addition, another title, which the author called "other publications" promoting the topic, is presented. Her publications have 200 citations in Scopus.

The technical characteristics of the dissertation make it possible to judge that it fully meets the formal requirements for such a work. The author has submitted the necessary documents for the authorship of the work and for the absence of plagiarism.

Regarding the content of the dissertation, the following assessment can be given:

b. Relevance of the topic.

In the introduction to the dissertation, Prof. Yordanova substantiates the relevance of her chosen topic. Modern universities should help their teachers and staff to turn their theoretical developments into successful practice, give students the opportunity to find their way in practice, including as entrepreneurs, remaining with a taste for science. In our country, this mission of modern universities is still not sufficiently aware and not enough is being done in this regard. This is why the research in this area is extremely useful.

c. Clarity of goals.

In the introduction, the author gives a detailed description of the goals she sets for herself with the development of this work, namely: to prepare a literature review and critical analysis of concepts, theories and approaches used in the scientific literature in the field of entrepreneurship and the role of the university in developing entrepreneurship among

students, to prepare a literature review and critical analysis of published empirical studies on the role of the university in the development of entrepreneurship among students, to identify university-related factors that have a positive influence on entrepreneurship among students, to create a conceptual model of the university-related factors that influence the attitudes, intentions and behavior for the development of technological entrepreneurship among STEM students, to conduct empirical research based on this model, to formulate practical guidelines and recommendations for the use of research results in practice.

The main thesis of the dissertation is that factors related to the university influence the attitudes, intentions and behavior for the development of technological entrepreneurship among Bulgarian STEM students. 23 research hypotheses were formulated.

Further specification of the objectives and hypotheses is given in the individual chapters.

d. Evaluation of the structure of the dissertation work.

The dissertation has a clear, traditional structure for such a work.

e. Content evaluation of the dissertation.

In chapter one, the author provides a detailed presentation of entrepreneurship as a process, models based on intentions, technological entrepreneurship: essence and specific characteristics, institutional environment and entrepreneurship, and in particular - institutional environment at the university level and entrepreneurship, the entrepreneurial university.

Chapter two is devoted to a review of the literature on the individual determinants of entrepreneurial attitudes, intentions and behavior - on the

role of demographic characteristics, psychological traits, human capital, social capital and role models.

The author then dwells on the university determinants of entrepreneurial attitudes, intentions and behavior – entrepreneurship education, university support for entrepreneurship, achievements in scientific research and others. Conceptual models and hypotheses are presented and also discussed in detail.

Chapter three is devoted to a description of the research methodology. Based on a review of documents and publications, the specifics of the environment for the development of entrepreneurship in Bulgaria, entrepreneurial activity in Bulgaria, entrepreneurship training in our country are outlined. The way in which the survey is carried out and the methods used are further presented.

Chapter four is devoted to the conducted study among STEM students studying at Bulgarian universities. A pilot study was conducted among 15 students in order to test the initial version of the research questionnaire, and a study itself was conducted among 1061 STEM students from 15 Bulgarian universities, in some aspects of the survey, the sample changes in terms of its nature. The statistical methods of processing the collected data are presented. The obtained empirical results and the assessments of their practical importance have been discussed in detail. It should be pointed out that the study provides very interesting reasoning about causes and future actions.

e. Assessment of the contribution nature of the dissertation work.

I agree with the author's statement that "the results of the research can help the state authorities proposing policies and strategies for the development of entrepreneurship in Bulgaria, as well as the Bulgarian universities that offer training in STEM specialties, to create and introduce

policies and measures supporting both the early stages and more advanced stages of the technology entrepreneurship development process among STEM students”.

I agree with the contributions of the study mentioned by the author, which she systematizes into two groups. The scientific contribution group is referred to:

- The systemization of definitions, theoretical approaches and models in the field of entrepreneurship.
- The development of four conceptual models of university-related factors influencing attitudes, intentions and behaviors for the development of technological entrepreneurship among STEM students. They contribute to a better understanding of the process of developing technological entrepreneurship and underline the importance of each consistent element of it for the realization of entrepreneurial behaviour.
- The development of a toolkit for researching attitudes, intentions and behaviors for the development of technological entrepreneurship among STEM students.

The scientific and applied contributions are those related to the results of the survey:

- New knowledge was obtained about technological entrepreneurship among Bulgarian STEM students and the role of the university for the attitudes, intentions and behavior for development of technological entrepreneurship among Bulgarian STEM students.
- The results obtained are relevant for the creation and implementation of support policies and measures in order to stimulate technological entrepreneurship among Bulgarian STEM students.

- The results obtained are relevant for improving the entrepreneurship training of STEM students in Bulgarian universities.

f. Critical notes and recommendations.

I have no objections to the presented dissertation, especially since the author has described the limitations of the research in great detail. I will make some recommendations for her future work.

I accept the concept of "entrepreneurial university" as a concept for research purposes. At the outset, I will note that good practices in the creation of modern universities in the world usually consider entrepreneurship as well integrated into the overall vision of the university. The proposed work models are highly sensitive to environmental factors (even outside the entrepreneurial one) such as national culture, traditions, resources, institutional environment (in the sense of beliefs that are no longer questioned, taken for granted) and others. For this reason, it is difficult to move the good practice mechanically from one place to another. (Even years ago, when European innovation regions were being worked on, this premise was used.) Researching solutions in a small country is a difficult and, perhaps, thankless job. After all, this is our country and such research should be conducted. This is why I recommend:

1. In addition to the identification of the object - its description for the needs of management, for the same needs it is critically necessary to examine the impact of the wider range of significant environmental factors.
2. To propose/choose Bulgarian solutions (models for practical work in Bulgarian universities) and to make an attempt to research them with appropriate methods (including prognostic expertise, analysis of case studies and others).
3. About Likert scales - when gathering opinions on subjective sensations they can be more generalized (e.g. with 5 divisions), but when the question

is about something that exists outside the subject, for better comparability of the opinions, it is usually good to indicate at least a few keywords for individual divisions.

4. When citing publications in different languages, it is permissible in the bibliography to translate the data about them into the main language of the work in which they are cited, usually noting that the original of the cited work is in another language (although this is not always done). However, I have not come across a variant like the one used by the author - the names of the authors of works published in Cyrillic are written in Latin, and the rest of the text is in Cyrillic. That doesn't make sense. In this case, a block of the corresponding writing is distinguished.

5. Since the work is addressed to Bulgarian practice, it is good to be presented (published) in Bulgarian too.

6. About the entrepreneurship courses. The author mentions too that their content is very important. In addition to knowledge that the future entrepreneur needs, they must create him. After James March topped the ranking of the considered as "guru" in the field of management years ago, he gave in various ways a very interesting interview. I will only mention here that he attached great importance to teaching work, because he thought that his task was not to give solutions to any particular business by consulting it, but to create people capable of solving their problems for at least the next 50 years (some of which at the time of training can hardly even be assumed to arise in the future), and this is very difficult and requires extraordinary effort and dedication. It turned out that he offered a variety of courses well liked by students, ranging from "What Can We Learn from the Novel "Don Quixote" About Management?" (he had developed other literary works as courses too) to a course on Business and Friendship (I don't dwell on his comment about this course) and come to courses devoted to quantitative

methods in management. As you can see, these courses do not explicitly talk about entrepreneurship, but they create creative individuals, ready to take fate into their own hands, to take risks, and therefore, perhaps, they really are a good basis for creating future entrepreneurs. These courses could have chosen students from different scientific disciplines.... Perhaps it is really worth investigating what knowledge, skills and roles should be acquired in connection with entrepreneurship and how, when and where in modern conditions this could be done.

I hope that Prof. Yordanova will continue her work in the indicated directions, I even allow myself to recommend to her in the future to organize a scientific seminar at the faculty (management department) on the very important issues raised above.

IV. Conclusion.

Based on the merits of the presented work, which I give a high assessment, I also highly appreciate the qualities of its author as a researcher and recommend with conviction the awarding of **Desislava Ivanova Yordanova** the educational and scientific degree **Doctor of Sciences**.

Reviewer:

/prof. Dr. Anastasia Bankova/

Date:

August 20, 2022, Sofia