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Impact of support of teacher and compatibility with needs of study on usefulness of SPSS by students

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ABSTRACT

The aim of this study is to expand the TAM (Technology Acceptance Model) in the research of different aspects of acceptance of software packages used for statistical analysis (SPSS), by including three factors: perceived support from the teacher, perceived compatibility with the academic needs of students of economics and business and perceived usefulness of statistics. The study shows that (i) the perceived usefulness of statistics plays an important role in perceiving the usefulness of SPSS and the ease of its use; (ii) support of teacher significantly contributes to the easier use of SPSS; (iii) that perceived compatibility with the academic needs of students positively impacts the perceived usefulness of SPSS and the intention to use it in the future, and (iv) higher the perceived ease of use of SPSS, higher on average its perceived usefulness. We also found that there are almost no significant differences between the conceptual model for undergraduate and postgraduate students. However we found that there are statistically significant differences between undergraduate and postgraduate students regarding perception of the usefulness of SPSS and usefulness of statistics.

1. Introduction

Today we are witnessing a significant technological breakthrough that facilitate both organizational and individual learning, therefore this complex and dynamic reality requires new forms of delivery of learning content to students, as well as the building of special learning environments and new teaching methodologies for academics (Ordóñez de Pablos, Tennyson, & Lytras, 2014). But formal instruction still occurs predominantly in classroom environment, despite the rapid progress of new technologies (Ordóñez de Pablos & Tennyson, 2013), whereby they can extend the range of instructional practices with software support which can facilitate learning for the students and motivate them to use it independently (Zhang, Liu, & Ordóñez de Pablos, 2014).

The starting point when forming the research model of the present study was the Technology Acceptance Model (TAM). TAM is the most widespread and used model to determine the usefulness of IT solutions, software support, and technologies in various fields of science. TAM attempts to explain why individuals choose to adopt or not to adopt a particular technology or IT solution when performing a task, in our case the focus is acceptance of the Statistical Package for the Social Sciences (SPSS) statistical support program. Based on Venkatesh and Davis research (Venkatesh & Davis, 1996), we hypothesized using TAM that beliefs determining attitudes and intentions about accepting, adopting and using SPSS statistical support program, are perceived ease of use and perceived usefulness of SPSS. The enhancement of TAM in this study is conducted by the inclusion of factors of teacher support, perceived usefulness of statistics and perceived compatibility with the needs of study, as the antecedents of perceived usefulness and ease of use of SPSS statistical support. By going a step further and understanding what determines the perceived ease of use and perceived usefulness of SPSS, "researchers and practitioners would be in a better position to design training interventions to effectively manipulate ease of use perceptions to foster increased user acceptance and use" (Venkatesh & Davis, 1996, p. 452).

The motivation for our study lies in the fact, that there is a great need for the use of statistical support programs, both in scientific research and in the business world, in order to make accurate and efficient data assessment possible. Due to the ever-increasing amount of data available to organizations, knowledge of data processing and analysis by means of statistical support programs is a significant advantage for the individual. The intelligent collection and assessment of data using generally accepted quantitative methods is in any case of key significance for process understanding and decision making (Morgan, 1998).

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Users tend to use statistical support programs for two reasons: simplicity of use and speed (McCullough, 2000). There is a series of such programs, some of which are highly specialized. Researchers also carry out comparative analyses of these programs. Such analyses are important in helping users more easily select suitable tools for analytical purposes, or at least understand how one statistical support program differs from others (Keelinga & Pavurb, 2007).

At business schools the statistical support program most often used in the academic process and within the social sciences framework is SPSS, along with others such as SAS, Minitab, and Excel (Dielman, 2002; Anthony, 2000). SPSS "is a package of programs for manipulating, analyzing, and presenting data; the package is widely used in the social and behavioral sciences" (Landau & Everitt, 2004). Despite the endless possibilities offered by sophisticated support programs, some students are not prepared for the use of such technologies. Of central importance here is the choice of such a tool that will offer the student the maximum ease of interactive use and a solid connection between data, graphs, analysis, and transferability. A suitable choice is one that, given appropriate use, allows for greater student cooperation and greater interaction among students and with the instructor. Only with an increased emphasis on statistical education at all levels of education can we expect high-quality research projects to provide information about the appropriate use of technology in the improvement of students' study of statistics in the future (Chance, Ben-Zvi, Garfield, & Medina, 2007). For this reason, the faculties of economics and business in Slovenia strive to ensure that students acquire, among other things, knowledge of the use of the SPSS statistical support program within the framework of the academic process. Unilateral effort is not enough, however: students must sufficiently perceive the usefulness of SPSS. We have therefore posed the research question: Which factors influence the perceived usefulness of SPSS among students? The area of SPSS use by students is deficient, as few researchers have dealt with it in their research. Studies are aimed primarily at examining the use of e-learning technology, Internet software, blended learning, etc. (Cothran, 2011; Lee, 2010; Padilla-Meléndez, del Aguila-Obra, & Garrido-Moreno, 2014). Researchers in the area of statistical program supports have mostly studied factors referring directly to SPSS, statistics, or satisfaction with achievement, along with their impact on the perceived use and ease of use of SPSS (Brezavšček, Šparl, & Žnidaršič, 2014; Hsu, Wang, & Chin, 2009).

Researchers have above all disregarded the role of the instructor and his active support in students' perception of the use and ease of use of the statistical support program SPSS. It is the academic staff who must establish a relationship with students and transfer competence and with whose help students will understand and perceive the usefulness and ease of use of SPSS. By using statistical support programs, students gain important knowledge in the use of statistics and quantitative research methods. For this reason, researchers emphasize that teachers must reflect on and constantly evaluate their own personal theories of learning and teaching, while at the same time experimenting with various teaching approaches and observing their results, not only by means of conventional testing but also by listening carefully to students and assessing information that reflects the various aspects of their teaching. In this way, teachers can constantly analyze and improve their theories as to how students can learn statistics using statistical support programs (Garfield, 1995). At the same time, there is very little research into perceived student compatibility of transmitted knowledge with the needs and field of current and future studies. Both variables are included into the research model.

"Statistics is the science of the planning studies and experiments, obtaining data and the organizing, summarizing, presenting, analyzing, interpreting, and drawing conclusions based on the data" (Triola, 2011). Although it may be expected that the perceived usefulness of statistics may directly shape the perceived usefulness of SPSS statistical support as well as the perceived ease of its use, only few researches in the past are analyzing the perceived usefulness of statistics by students; besides this these researches are focused mainly on attitudes toward statistics included as dependent variable into the model (Chiesi & Primi, 2009; Hagen, Awosoga, Kellett, & Die, 2013; Jatnika, 2015, etc.). Therefore the survey conducted within the present research focuses on perceived usefulness of statistics, as an antecedent (additionally to the perceived teacher support and compatibility with needs of study) of perceived usefulness and perceived ease of use of SPSS statistical support.

This paper addresses the following basic questions: Is it relevant to expand TAM with factors of teacher support, perceived usefulness of statistics and perceived compatibility with the needs of study (as presented by the research model by Fig. 1)? Is the level of studies (undergraduate and postgraduate studies) important for acceptance and intentions to use SPSS statistical computer software? Therefore the objective of this research is to determine: (1) the impact of perceived usefulness of statistics on the perceived usefulness of SPSS and perceived ease of its' use; (2) the impact of instructor support on the perceived usefulness and ease of use of the SPSS statistical support program, (3) the impact of perceived compatibility with academic needs on the perceived usefulness and future intention to use SPSS, (4) the influence of perceived SPSS usefulness on the intention to use it, and (5) the relationship between SPSS ease of use, usefulness, and the intention to use it. Besides that the differences between groups of undergraduate and postgraduate students are analyzed. Because there are so few studies dealing with the use of computer-based statistical support programs within the academic process framework by university students, the answer to the research question will be an important scientific contribution to the clarification of the expansion of the TAM model and the use of statistical support programs.

2. Literature review

2.1. The model TAM

The source model of TAM is the model based on the theory of reasoned action (TRA) (Fishbein & Ajzen, 1975). TRA was the predecessor of models for the acceptance of information technology. From TRA, TAM developed as a model for predicting the acceptance of information technology. Parallel to the TRA and TAM models, the model of theory of planned behavior (TPB) was also developed (Ajzen, 1991). TPB also incorporated the perceived behavioral control component in the TRA model. Venkatesh, Morris, Davis, and Davis (2003) proposed a unified model called the unified theory of acceptance and use of technology (UTAUT). UTUAT states that "Performance Expectancy which is an extension of Usefulness from TAM, Effort Expectancy which is an extension of Ease of Use from TAM, Social Influence and Facilitating Conditions are determinants of Behavioral Intention or Use Behavior, and that Gender, Age, Experience and Voluntariness of use have moderating effects on the acceptance of IT" (Terzis, Moridis, & Economides, 2012).

TAM is one of the very frequently used models for researching the usefulness of technology, program supports, and information solutions. It comprises two key components: perceived usefulness and perceived ease of use, and is defined as "the degree to which a person believes that using a specific system would be free of mental and physical efforts" and "the degree to which a person believes that using a specific system would enhance his/her job performance," respectively (Davis, 1989, 1993). Perceived usefulness is defined as "the degree to which a person believes that using