INTERPLAY OF ERP AND CONTROLLING: FUTURE BUSINESS SKILLS OF ENTREPRENEURSHIP EDUCATION

Elvira Böcskei, Budapest University of Technology and Economics, Hungary
Vencel Kis, Budapest University of Technology and Economics, Hungary

ABSTRACT

The combination of IT and accounting skills created the field of ERP which became a new technology. By analyzing a big amount of information, could help us bring new ideas, offer better solutions and first of all react faster. Highlighting one more trend that has a positive impact on business is the "expansion of education" which clearly expresses the importance of our Institutes. Education should strongly co-operate with the private and public sector and get notification about the industrial changes and needs. The experts need to find the golden mean and try to get out the most of this phenomenon. We believe that education has a big role in this serious adjustment. Scientists do researches about the way toward the effectiveness and also the role of human skills and capabilities besides the development of technology.

In the past decades, particularly in the past years, the players of economics faced new challenges caused by its dynamic change. Thanks to the power of digitalization, people can access to any kind of fresh information within a glance. That information made and makes radical change in corporate decision-making and its quality and quantity.

We aimed to find correlation and trend by observing the Students' educational background and behavior. We assume that the success of an ERP course can be foreseen based on the qualification of the Students. The two factors are the type of programme and the level of skills. Neither the Accounting curriculum nor the IT can meet with success alone, just together.

We did our research at one of Central-Europe's well-thought-of Universities called Budapest University of Technology and Economics (301-500th on Quacquarelli Symonds (QS) British ranking firm's list). The aspects of choosing the University are: both economical and information technology education must be provided.

Keywords: Education, ERP System, Financial and Managerial Accounting, Controlling, Business Skills.

INTRODUCTION

Countries in Central and Eastern Europe are not developed enough, their economy, their education, their culture cannot compete with the West - people would say. Here we interrupt this mindset and try to give a quick insight from our point of view. In Hungary, after the systemic transition, the controlling as such started to emerge. Since then, many of multinational corporations with developed organizational culture and technology have set up subsidiary companies and this brought a new wave to this country. However, this 20-30 year-long period is not much to rise; even so we are not that backward in the perspective of controlling anymore.

In Hungary, the level and quality of education is rather high, thus many of foreign students choose this country for learning. One of the interesting parts of our research is the fact

Citation Information: Böcskei, E., & Kis, V. (2020). Interplay of ERP and controlling –future business skills of entrepreneurship education. *Journal of Entrepreneurship Education, 23*(S2).

that the universities here are homogeneous, they are economical or technical, but only exists one among them where both these two fields are presented and this is our university, the Budapest University of Technology and Economics. In Hungary, the controlling is uprising, the IT has been advanced for long time and now we must bring it together by preparing and supplying those opportunities for Students where they can get proper skills. This is our aim and this is what are working for.

LITERATURE REVIEW

Interplay of ERP and Controlling-Tools in Service of Decision-Making

Information technology should be involved in the accounting and vice versa. These two areas must strengthen each other. Some researchers declared the importance of brining business analytics tools to the entrepreneurial education (Komarova et al., 2019), but this is right in other IT and economical areas as well like the ERP and the controlling. Laudon & Laudon (2019) said that the information systems and the decision-making tools have been in the service of corporation management for long times (Laudon & Laudon, 2019; Bayaraa et al., 2019). Decision-making tools appeared in resource planning a few decades ago and provide information to various level of the corporation.

There is a system called Enterprise Resource Planning system which is designed to centrally integrate all functions of the business to increase effectiveness and efficiency (Morris & Venkatesh, 2010). Installing an ERP system means a radical technological change, which transform procedures, functions and habits in the corporate culture and even some of the methods lose their significance (Umble et al., 2003). Before implementing that system, management need to be sure that the firm is organizationally ready to absorb the new scientific know-how (Vidyaranya et al., 2005).

However, an ERP system is a perfect tool, but not for everybody. There is a size limit over which the corporation must be, otherwise, it will make the firm's life rather complicated. Those firms can not enjoy the ERP system provided benefits, but also it could be financially a bad choice. Looking at the positive side, for bigger firms, it is worth to investigate in this technology in order to keep the information and data up to date.

One of the biggest motivations for the corporation to install ERP software is the ability to control every single step throughout the whole supply chain from the material purchasing until the logistics and transportation. The controllers' task is to collect data from this supply chain, analyze it and create multifarious kind of reports. By analyzing the actual and planned data through the reports, the management can define barriers and become able to react as soon as possible to threats. (Kozma et al., 2015; Tóth & Kozma, 2016) Besides, the controllers should play a serious role in profit-maximizing by optimizing cost and planning cash-flow. So that the whole procedure can be controlled thank to the recording of so-called accounting events.

Important segments of the ERP system:

1. MRP I. (Material Requirement Planning) and its functions are:
   a. Demand Planning
   b. Bill of Material which shows the elements what the material's structure contains (BOM)
   c. Inventory Management for storing materials and controlling the quantities
   d. Production Scheduling group by periods

Citation Information: Böcskei, E., & Kis, V. (2020). Interplay of ERP and controlling –future business skills of entrepreneurship education. *Journal of Entrepreneurship Education, 23*(S2).

2. MRP II. (Material Resource Planning) contains the following functions:
   a. Demand forecasting
   b. Capacity planning
   c. Recording financial information
   d. Marketing management
3. Customer Relationship Management (CRM)
4. Supply Chain Management (SCM)
5. Creating reports

Some researchers think that the most important and crucial factor is the top management support (Bhatti, 2005; Gargeya & Brady, 2005) which can be done by the proper statements set by the controlling. Many sorts of reports can be queried and gained from the ERP system, but in order of comparability, there must be a trend in the type of reports. Experts mentioned that the managers will define reports which are the most suited for them (Prosser et al., 2017). Some functions and methods need to be changed frequently and to enforce this, management should give massive support (Chopra & Meindl, 2007).

Financial and Managerial Accounting-Revenues and Costs

Due to the high concentration of competition and the reduced life cycle of services and products, managerial accounting must contribute to the corporation's prosperity and the management must be aware of the financial consequences of decisions they make. Thus, management has to pay attention to querying information, then analyzing it, finally making the decisions (Batchimeg et al., 2019). This information is provided and evaluated by the accountants (Hartgraves & Morse, 2015). The accountant must have the skills to determine the relevant and useful information and to transmit its impact to the management level that is why the management needs to trust in accountants that they understand their need and will able to provide the desired reports (Elliott & Elliott, 2007).

For analyzing actual and planned data and finding out solutions to several unlikely situations, it is more than important to be familiar with the financial and managerial accounting. In the 21st Century, in the time of digital society, the prerequisites of managerial accounting and financial analysis are the transparency, predictability and flexibility, and here starts the controlling as such. Although financial accounting is used by decision-makers inside and outside the firm, financial accounting typically emphasizes external users, such as security investors, analysts, and lenders (Hartgraves & Morse, 2015), managerial accounting is about providing useful information to the top management, so it emphasizes internal users. However, it seems that financial and managerial accountings are strictly different fields, but they do not stand alone (Ittner & Larcker, 2001), their relationship is rather reinforcing.

Information written in the annual accounts must be enthusiastic for the stakeholders and managers of the corporation (Fenyves & Tarnóczi, 2019). Diving more deeply, it requires a higher professional knowledge to understand the correlations. Managerial accounting or controlling provides authentic financial and nonfinancial information to successfully perform managerial tasks (Zéman et al., 2016).

Comparison of the planned expenses, revenues and performances with the actual data, considering the differences and find quick fixes to abnormalities are the main responsibilities of

Citation Information: Böcskei, E., & Kis, V. (2020). Interplay of ERP and controlling –future business skills of entrepreneurship education. *Journal of Entrepreneurship Education, 23*(S2).

the controller. Controllers furthermore must pay genuine attention to the trustiness of data, the applied methods' exactness, level of professionalism of interpretation, the credibility of results and not least the proper consequences.

Medium and large corporations are those, whose focus should be aimed to cost planning. These costs can be either direct or indirect, efficiency is the primary goal. Enterprises have to make detailed budget calculation to achieve these above-mentioned targets.

Revenue and Expense *vs.* Cash Flow Reporting

Cash flow report faces the cash and cash-equivalent transferred into and out of the corporation. By reading that report, not only the flow of cash becomes clear to management, but it is a perfect tool as well to figure out reasons from. For the top management, it is an expectation to be aware of the up-to-date money stock and in order of future cash optimization; they wish to know the expected cash flows. Getting more in detail, some researchers said that the cash flow is a good indicator for future investments like opportunities (Gilchrist & Himmelberg, 1995). Cash flow reports can be especially fruitful to those corporations who have a serious funding problem. More reliable cash flow prediction would help managers to a better position to identify problems and to blueprint an approach in order to overcome difficulties and move their business in a positive direction (Cheng & Roy, 2010).

Organizations record their revenues, expenses and costs to that period when it's occurred, independently from the real cash flow. Revenues do not mean money-transferring into the bank account or pay desk immediately at the time. The same situation is with the expenses. Giving out cash does not appear as an expense forthwith. For instance, in the case of investments when a firm decides to invest in a production line, accountants can post to tangible assets only after it put into service and the accounting of depreciation.

We can measure the efficiency of management's decision-making through the cash flow, which is why the cash flow related factors can be quantified. By quantifying those factors, corporations can avoid false decisions and their consequences with particular regard to the liabilities.

Problem-Based Learning

Every situation can be thought of as a challenge or problem that needs to be solved. Of course, there are two types of problems: one for the activities and the goal that experts have to achieve and the other is the real problems and issues. The theory is pretty the same: there is a starting point, the actual state and we are trying to reach to finish line and find out a proper result.

Solving problem is a problem-solving strategy can be learned during the activity itself but in a better case, this skill of the (future) workers need to be prepared accordingly. This method is called Problem-Based-Learning. As Kovalenko et al., (2019) think, this way of teaching will lead to a better chance to gain and new improve extant skills (Kovalenko et al., 2019). Munawaroh also declared that this methodology is capable to make students stay focused on work rather to SWOT theoretic things (Munawaroh, 2018).

It is very important that the theory and practice implement each other because most people concerned are not aware of the curricula transformation from lecture-based to problem-based (Kolmos, 2017).

Citation Information: Böcskei, E., & Kis, V. (2020). Interplay of ERP and controlling –future business skills of entrepreneurship education. *Journal of Entrepreneurship Education, 23*(S2).

Future Trends

It is rather obvious that the trends will change not only in technologies but in the environment of technologies as well. This environment means aspects related to technological change. As people may know, developing new technology will lead to getting new skills, abilities and opportunities to learn and learn from. If a new procedure or way of creating market value comes up, people should conform by diving into it. This reaction can be called as the *"life-long learning"* since it requires broadening our horizons throughout our lifetime.

There are some trends that have the impact positively or negatively to the growth of business (World Economic Forum). In 2022, the most affecting will be the *"increasing adoption of new technologies".* The combination of IT and accounting skills created the field of ERP which became a new technology. As this paper discussed before, for few SMEs and especially even bigger corporations the ERP system is a must, which forces them to adopt that new trend in business. There is another field called big data, which is a quite new scientific knowledge. Analyzing a big amount of information could help us bring new ideas, offer better solutions and first of all react faster. Highlighting one more trend that has a positive impact on business is the *"expansion of education"* which clearly expresses the importance of our Institutes. Education should strongly co-operate with the private and public sector and get notification about the industrial changes and needs. This is the only way to prepare students for work. Besides these ideas, there are some negative trends like the *"shift of mindset among new generation"*. Of course, as trends and technologies change, the mindset of the new generation also does so. On the other hand, the older generation has an established mind. Swaramarinda (2018) did a research about the willingness of adopting Information Technology into Education and combining her results and those we shall say that particularly the elder people may find it inconvenient to learn new trends and change their mindset, because many of them do not feel enough confidence in acquiring new things (Swaramarinda, 2018). Somehow experts need to find the golden mean and try to get out the most of this phenomenon. We believe that education has a big role in this serious adjustment (Table 1).

Table 1
TRENDS THAT AFFECT THE BUSINESS - TOP SKILLS
SOURCE: WORLD ECONOMIC FORUM. (2018). THE FUTURE OF JOBS REPORT 2018

Trends Set to Positively Impact Business Growth up to 2022 ↑	Trends Set to Negatively Impact Business Growth up to 2022 ↓
Increasing adoption of new technology	Increasing protectionism
Increasing availability of big data	Increase of cyber threats
Advances in mobile internet	Shifts in government policy
Advances in artificial intelligence	Effect of climate change
Advances in cloud technology	Increasingly ageing society
Shifts in national economic growth	Shifts in legislation on talent migration
Expansion of affluence in developing economies	Shift in national economic growth
Expansion of education	Shifts of mindset among the new generation
Advances in new energy supplies and technologies	Shifts in global macroeconomic growth
Expansion of the middle classes	Advances in artificial intelligence

Citation Information: Böcskei, E., & Kis, V. (2020). Interplay of ERP and controlling –future business skills of entrepreneurship education. *Journal of Entrepreneurship Education, 23*(S2).

Researchers presume that the importance of several skills will differ (World Economic Forum). Some of them will move toward the top and some of them will become less useful than before. Without any doubt the leading skill is the *"analytical thinking and innovation"* both in 2018 and in 2022, however the *"active learning and learning strategies"* seems to be uprising. There is a key skill that will step among the tops: *"technology design and programming"*. Again, the technological change is the responsible that causes effects also in its environment. Another rising knowledge will be the *"leadership and social influence"*, *"system analysis and evaluation"* and *"creativity, originality and initiative"*. On the other hand, key skills like *"critical thinking and analysis"*, *"complex problem-solving"*, *"emotional intelligence"* and *"reasoning, problem-solving and ideation"* will turn to a negative direction (Table 2).

Table 2
KEY SKILLS IN 2018 AND 2022
SOURCE: WORLD ECONOMIC FORUM. (2018). THE FUTURE OF JOBS REPORT 2018

	2018 - TOP 10 Skills	2022 - Trending TOP 10 Skills
1	Analytical thinking and innovation	Analytical thinking and innovation
2	Complex problem-solving	Active learning and learning strategies
3	Critical thinking and analysis	Creativity, originality and initiative
4	Active learning and learning strategies	Technology design and programming
5	Creativity, originality and initiative	Critical thinking and analysis
6	Attention to detail, trustworthiness	Complex problem-solving
7	Emotional intelligence	Leadership and social influence
8	Reasoning, problem-solving and ideation	Emotional intelligence
9	Leadership and social influence	Reasoning, problem-solving and ideation
10	Coordination and time management	System analysis and evaluation

Many other researchers like Pathak do believe that the course must comply with the skills expected in the future (Pathak, 2019). However not only the generation's mindset is about to change, but the technology and new methodologies affect the market, trends and needs to a new direction. Educational Institutions must be aware of this transformation.

RESEARCH METHOD

The efficiency depends on many things. Scientists do researches about the way toward the effectiveness and also the role of human skills and capabilities besides the development of technology.

In the past decades, particularly in the past years, the players of economics faced new challenges caused by IT's dynamic change. Thanks to the power of digitalization, people can access to any kind of fresh information within a glance. That information made and makes radical change in corporate decision-making and its quality and quantity.

The crucial questions of our research are:

1. Are the freshly graduated Students required to be aware of the IT background of the corporation decision-making's efficiency and the knowledge regarding decision-making? Especially respecting the fact that these young adults have been grown up alongside digital technology.
2. How could education conform to these new requirements?

Citation Information: Böcskei, E., & Kis, V. (2020). Interplay of ERP and controlling –future business skills of entrepreneurship education. *Journal of Entrepreneurship Education, 23*(S2).

3. How could education meet the requirements and not to do so at the expense of the quality of science and education?
4. Is it possible to be familiar only with one of the fields (IT or Accounting) and does it have any effect when the students need to make economic decisions?

We did our research at one of Central-Europe's well-thought-of Universities called Budapest University of Technology and Economics–301-500th on Quacquarelli Symonds (QS) British ranking firm's list (Eduline, 2017).

The aspects of choosing the University are:

1. Both economical and information technology education must be provided
2. Opportunities to bring these fields together
3. Not only from the present country but other foreign researchers must participate in the pilot test

There are some experts turning out from different countries' different economical and information technological educational institutions. Two unique areas, so many experts specialized in one or another, but there is a new demand came up recently, to link those to each other and the Budapest University of Technology and Economics does so and this University is the stronghold of Hungary. By defining tasks to measure Students' knowledge, we had to pay attention to skills what they had prior to the test and the perceivable ones can be gained by completing the course.

Research Model

We hypothesize that there is an intensive ERP-related course for Students to apply and by taking over that course; Students will have a chance to improve their skills and even more, to get new ones. Of course, this progress is really depending on some factors like the educational background of Students, the quality of Lecture and so on.

The model (Figure 1) describes our ideology about the implication of new skills. This is a procedure that starts at the beginning of the ERP course and finishes at the end of the course. We will explain later in this paper what the input and perceivable skills are and the trends to positively impact business along with trending skills are detailed before. The most important thing is that perceivable skills offered by the ERP course diverge to those future-related competencies and expectations.

Citation Information: Böcskei, E., & Kis, V. (2020). Interplay of ERP and controlling –future business skills of entrepreneurship education. *Journal of Entrepreneurship Education, 23*(S2).

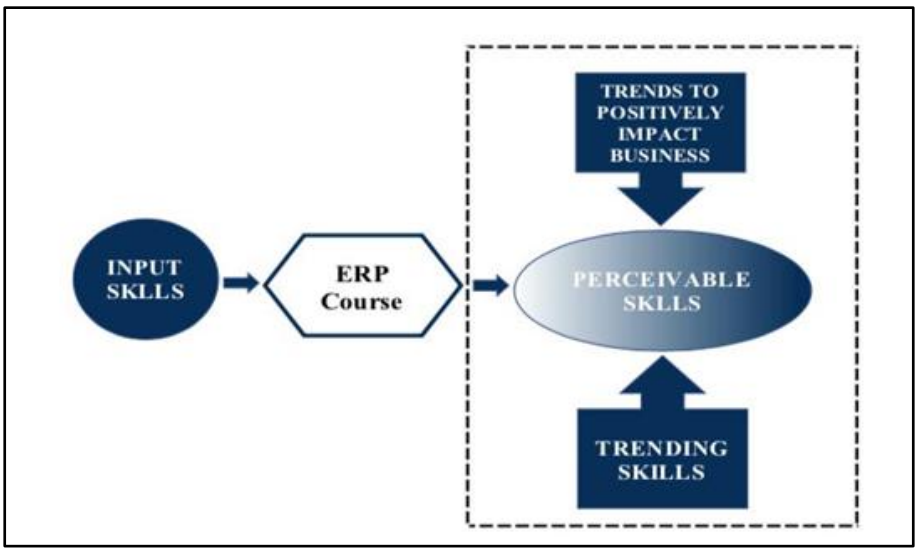

FIGURE 1
MODEL

By linking this model and the Students' result to each other, we become able to conclude the most effective clusters, mindsets and we can bind perceived skills to future trends regarding the groups' characteristic

Control-Groups as Clusters

We decided to do our research by defining control groups. We set up a control-group with heterogeneous skills and also a non-heterogeneous one. We aimed to find correlation and trend by observing the Students' educational background and behavior. We assume that the success of an ERP course can be foreseen based on the qualification of the Students. The two factors are the type of Programme (BSc, Economy, IT) and the level of skills (low, high). We can select Students into four clusters regarding their knowledge, more specifically their Educational background prior to the course. First cluster called *"All BSc Programme attended Accounting course"* contains those, who are attending any kind of BSc Programmes like Mathematics, IT, Economics etc. but a very important fact is that they have learned Accounting at least for one semester but have not learned Information Technology. The second group, the *"Finance and Accounting Programme".* They have massive knowledge in Accounting but not much in Computer Science. In their educational portfolio, emphasis is laid on the understanding of financial and accounting processes and the integration of this knowledge into the business operations. (https://www.gtk.bme.hu/) Third is the group of *"Business Informatics"* Students. They are a special cluster due to their curriculum. These participants have the knowledge about both the IT and the Accounting part. Mainly the IT is their strength, but the Accounting course is also part of their Studies because they specialized in Business. Students who graduated here have the ability to understand complex business processes, identify problems and develop problem-solving alternatives. In addition to this, they have the skills to recognize the needs of value-creating systems, plan, implement and manage that kind of systems. (https://vik.bme.hu) Fourth cluster is the opposite of the second, the *"Finance and Accounting Programme"*, named the cluster of *"Information Technology related Programmes".* These members are the professionals

Citation Information: Böcskei, E., & Kis, V. (2020). Interplay of ERP and controlling –future business skills of entrepreneurship education. *Journal of Entrepreneurship Education, 23*(S2).

of Computer Science but they are not familiar with the Accounting. In order of better comparability, one hundred Students were involved from each cluster. We decided the most effective number of participations to be 20 in a group. This seemed to be the optimal equidistribution.

From the Lecturer point of view, it is predictable that those Students apply the course who is interested in it at least a bit. We should check the composition of group whether it is homogenous or heterogenous. Optimally the group of participants is clearly homogenous: Economy or IT, in the best occasion when they are familiar with each, but if nobody has the skills in none of the areas, it is still not too bad, at least they are at the same level. Thanks to the homogeneity of the Students, the efficiency of course can be measured. In unfortunate case of heterogeneity, the Lecturer has a definitely tough job, in *"extreme"* situation, the successful education cannot be guaranteed.

There is another important aspect that can describe the success and efficiency. This is nothing but the Students' action and behavior. It is very interesting how the efficiency is shaped among them.

We can make a distinction between the Students:

1. Case: the Students have attended each Accounting/Controlling course during the semester and also they participated in the ERP course
2. Case: those Students get here, who have not attended the Accounting / controlling course regularly and they did not participate in the ERP course accordingly, but they must do an exam at the end of season.

It means that the case 1 is the one that has the ability to solve the task as a problem with a paper-based method and also navigating through the ERP software. The case 2 is the group, where the task was solved only on occasion of exam at the end of the semester and did not execute the ERP software just the paper-based alternative.

Input vs. Output Skills

In the Tables 3 & 4 below, we can see the skills that the Students should have before they are attending the ERP course and those, that they can get by accomplishing both in Accounting and IT areas. We identified the minimum requirements of applying this course and which are indeed indispensable and we present them as inputs. The column of outputs or gained knowledge is combined. First of all, an ERP system should offer the ability to gain these competences. Second, the colored skills are those, which this current case study can maximum ensures. We believe that the quantity of acquired competences is highly depends on the Students and their education background.

Table 3
INPUT AND OUTPUT SKILLS BEFORE AND AFTER THE COURSE IN IT FIELD

Field of Study	Input	Output
Information Technology	Basic knowledge	Basic configuration of ERP software
		Use of ERP software
		Master data, transactional data
		Administration task of ERP system
		Dataflow
		System analysis
		MRP

Citation Information: Böcskei, E., & Kis, V. (2020). Interplay of ERP and controlling –future business skills of entrepreneurship education. *Journal of Entrepreneurship Education, 23*(S2).

Within our research we measured the efficiency of the course looking at the perceived skills of Students. As you could read in the previous sections we identified those skills that an ERP system must offer and those that the Students can realize from this exact course. Here at our research we focus on the perceivable competences. Among them there are 16 from the Accounting knowledge and 11 from the IT. There is one more aspect that should be examined and this is the difference of paper-based solution and a digitized assessment. We did a pilot test in order to realize the *"power*" of digitalization. Those Students who did not regularly attend the class and thus they did only a paper-based arrangement instead of the ERP course had to do a similar task like the others did at ERP course, and it is a digitized version of paper-based test. There was no special software needed, the focus was on the digitalization itself.

Table 4
INPUT AND OUTPUT SKILLS BEFORE AND AFTER THE COURSE IN IT FIELD

Field of Study	Input		Output
Accounting	Income Statement	Revenue	Sales net revenue
			Other revenues
			Income from financial activities
		Costs	Type of costs
			Direct / indirect costs
			Cost allocation
		Expenses	Other expenses
			Financing expenditures
	Balance items	Fixed assets	Intangible assets
			Tangible assets
			Fixed financial assets
		Current assets	Inventories
			Debts
			Marketable securities
			Cash and cash equivalents
		Equity instruments	Share capital
			Capital surplus
			Retained profit
			Committed reserve
			Revaluation reserve
			Net income
		Provisions	Provisions
		Liabilities	Subordinated liabilities
			Long-term liabilities
			Current liabilities
		Accruals and deferrals	Accrued assets
			Accrued expenses and deferred payments
	Other	Documents / reports	Bills

Citation Information: Böcskei, E., & Kis, V. (2020). Interplay of ERP and controlling –future business skills of entrepreneurship education. *Journal of Entrepreneurship Education, 23*(S2).

			Agreements
			Analysis
			Inner reports

Analysis of Result

Looking at the cumulated diagram right below Figure 2, it is obvious that the Business Informatics and Finance and Accounting Programmes are the most suitable ones in respect of the course. The figure shows the results in three aspects: minimum, maximum and average performance grouped by clusters achieved during the ERP course. The above mentioned Programmes are roughly close to each other, but the two rests are less successful.

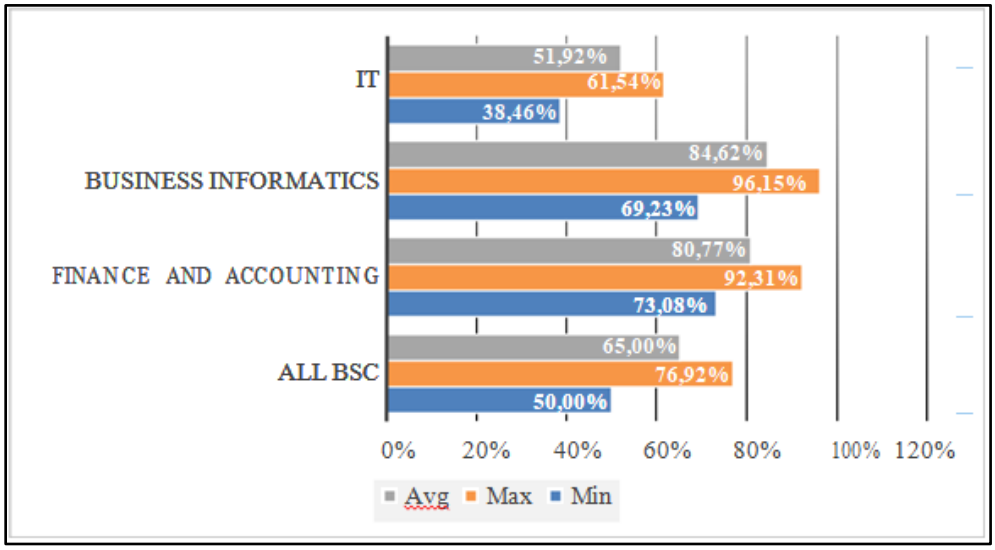

FIGURE 2
CUMULATED RESULTS

Next Figures 3-6 is placed in this section called Result in details. This figure draws the achieved points separating the Accounting and IT parts. Blue stripes go for the Accounting skills and the oranges ones go for the IT competences. Generally speaking, the BSc Programme who learned Accounting, the Finance and Accounting Programme and the Business Informatics Programme could earn more from the Accounting part and the purely IT Programme did not have much luck. On the contrary, from the IT-related perceivable skills, the pure IT and Business Informatics Students were outstanding. However, the Finance and Accounting cluster has fewer points from the IT skills but it has very promising results in Accounting. Business Informatics group is more balanced, although they did not achieve as much point in Accounting as the other cluster, but still very good. Besides, they have a magnificent outcome in IT competences.

Citation Information: Böcskei, E., & Kis, V. (2020). Interplay of ERP and controlling –future business skills of entrepreneurship education. *Journal of Entrepreneurship Education, 23*(S2).

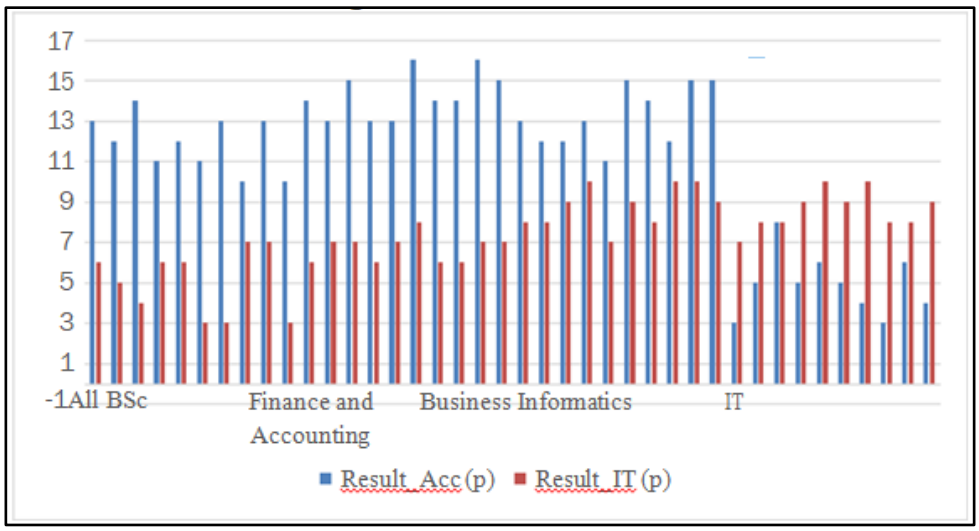

FIGURE 3
RESULT IN DETAILS

The last test was the influence of digitalization where the Students who did not participate in the ERP course must do a digitized version of paper-based task. Our result shows below that efficiency is much higher at the case of digitized test with the average of 33.85%.

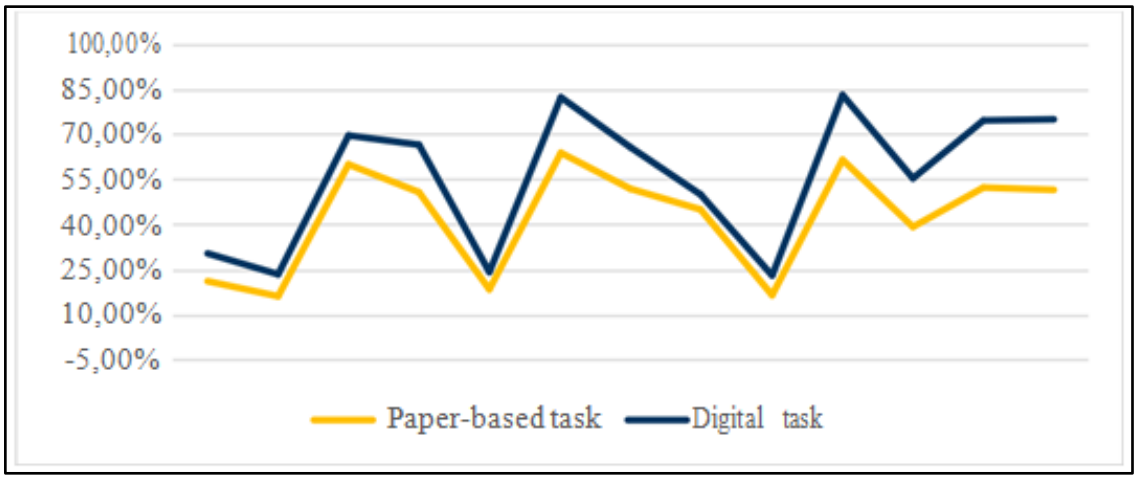

FIGURE 4
PAPER-BASED *vs*. DIGITAL TASK

Citation Information: Böcskei, E., & Kis, V. (2020). Interplay of ERP and controlling –future business skills of entrepreneurship education. *Journal of Entrepreneurship Education, 23*(S2).

FIGURE 5
TOP 6 PERCEIVED SKILLS

During the education, those six skills of Students became identified by analyzing the four clusters declared above, which showed to be developed the most.

1. Group of IT (Students learning advanced Information Technology):
   a. Significant development in the area of accounting. Besides inventories and sales-related revenues and costs, they understood how these accounting items affect the financial result both in the theoretical and practical side when people must make strategical decisions.
   b. Their IT skills are also said to be increased, especially the use of ERP software and the meaning of MRP algorithm.
2. Group of Business Informatics Students:
   a. They could develop their pragmatic skills of workmanship like analytical thinking, making inner reports or problem solving etc. As they should have been familiar with the accounting basics, the area of direct and indirect costs is where these Students could deepen their knowledge.
3. Group of Finance and accounting:

Citation Information: Böcskei, E., & Kis, V. (2020). Interplay of ERP and controlling –future business skills of entrepreneurship education. *Journal of Entrepreneurship Education, 23*(S2).

a. Analytical thinking, system analysis and problem solving are those where the development of Students could be measured. Thanks to their owned workmanship in the Accounting area, this group is aware of the consequences and effects of the financial decisions.

4. Group of All BSc

a. This group is still focusing on the creation of knowledge, especially gaining skills in the IT field.

In the case of Business Informatics and Financial and accounting groups, the digitalization is an important skill as it supports the development of analytical thinking. Regarding to the cost, the differentiation and types of costs became obvious. Thus, if they have expanded competencies of their profession, analytical thinking and making and analyzing inner reports appear to give prominence.

In the case of IT and All Bsc clusters, essential accounting terminologies like costs and revenues must be realized besides the understanding of the use or even the configuration of the ERP software. We should be clear; both *"basic"* clusters could acquire competencies in their *"foreign"* fields: IT Students mainly in the Accounting area and All BSc mostly in the IT area. Due to the lack of experience in practice, digitalization contributes to the professional knowledge acquirement. One more thing to be noticed looking at the education point of view, the diversified approach in favor of different group with diverse knowledge could be of use.

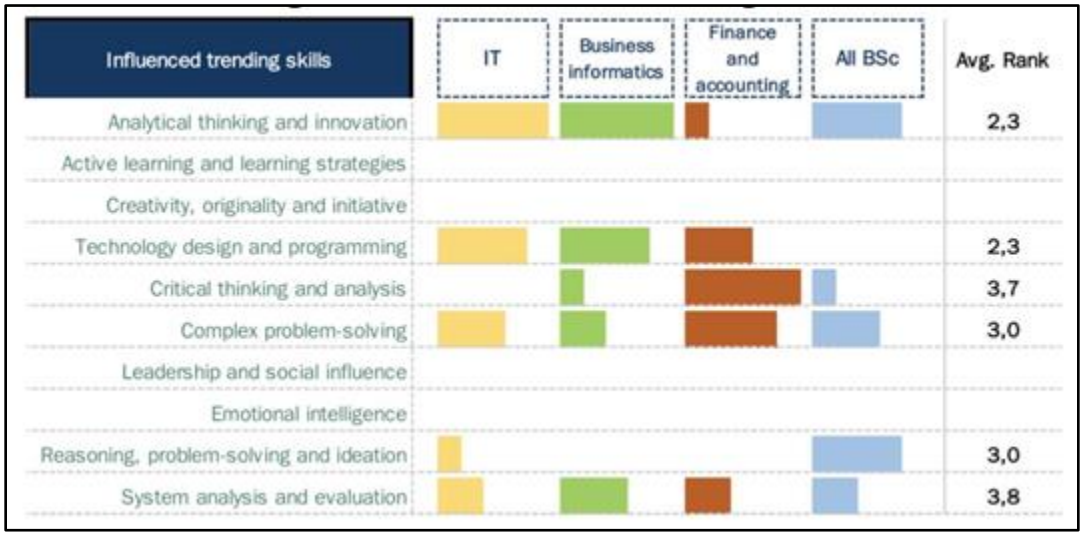

FIGURE 6
TOP 5 INFLUENCED TRENDING SKILLS

Absolving their studies, the members of the groups feel responsible for:

1. being able to think analytically
2. being aware of the most recent technological solutions, software and
3. having the ability to solve complex problems and analyze systems.

Based on our research results, these above-declared efforts seem to be valid initially at the group of Business Informatics and Finance and accounting.

Citation Information: Böcskei, E., & Kis, V. (2020). Interplay of ERP and controlling –future business skills of entrepreneurship education. *Journal of Entrepreneurship Education, 23*(S2).

CONCLUSION

Our result shows that the best result can be reached with the knowledge of both fields. Neither the Accounting curriculum nor the IT can meet with success alone, just together. As we could see those who are familiar only with one part, could not achieve the most in results. Almost does not matter if the Students are from Finance and Accounting or Business Informatics, both are able to reach high scores in this competition. The advantages of the Business Informatics Students are the following: they have a stronger system thinking skill, they can look on the system from a different angle, hence they have a full image of the corporation, they have the ability to recognize a missing gap and what is more, they may know how to implement it. The Finance and Accounting Programs Students also had quite good outcomes and they can suggest possible developing areas, but they are not able to do the programming part giving priority to the Business Informatics' group. Both of them will understand the question of cash flow and controlling even from a bit diverging aspect, but without any doubt, they are capable to improve skills that will be valuable in the near future according to experts like the analytical thinking, active learning, problem-solving, reasoning or software analysis.

In addition to this, better results can be aimed using the ERP software over the paper-based standard method. Students can understand better the *"problem"*/task and can develop solutions and combine curriculums. We believe it is because of the new technological change and its power on the new generation. Their mindset is totally different from the senior workers and they have grown up along with the digital approach. Thus, we think that the real reason for results is not only the ERP system itself, rather the digitalization as such. Vinogradova et al., (2019) emphasizes the influence of digital transformation in the education, however, from another aspects. Information technology is quite broad, and there are several opportunities ahead of us (Vinogradova et al., 2019). Theories are important for sure, but thinking with the mindset of this new generation, in education we must approach them through practical issues and through technology. The society is going to head toward digitalization of each area and we must get ready to confirm.

REFERENCES

Bayaraa, B., Tarnoczi, T., & Fenyves, V. (2019). Measuring performance by integrating k-medoids with DEA: Mongolian case. *Journal of Business Economics and Management, 20*(6), 1238-1257.

Bhatti, T.R. (2005). Critical success factors for the implementation of enterprise resource planning (ERP): Empirical validation. In the second international conference on innovation in information technology, 110, 1-10.

Cheng, M.Y., & Roy, A.F. (2011). Evolutionary fuzzy decision model for cash flow prediction using time-dependent support vector machines. *International Journal of Project Management, 29*(1), 56-65.

Chopra, S., & Meindl, P. (2007). *Supply chain management. Strategy, planning & operation.* In Das summa summarum des management, 265-275, Gabler.

Eduline. (2017). *Recent higher education ranking: two Hungarian universities among the best in the world.* Retrieved from http://eduline.hu/felsooktatas/QS_rangsor_legujabb_DZGATR

Elliott, B., & Elliott, J. (2007). Financial accounting and reporting. Pearson Education. Harlow.

Fenyves, V., & Tarnóczi, T. (2019). Examination of the expectations of controllers on the labour market. *Corporate Ownership and Control, 17*(1), 60-70.

Gargeya, V.B., & Brady, C. (2005). Success and failure factors of adopting SAP in ERP system implementation. Business Process Management Journal, 11(5), 501-516.

Gilchrist, S., & Himmelberg, C. (1995). Evidence on the role of cash flow for investment. *Journal of Monetary Economics, 36*(3), 541-572.

Hartgraves A.L., & Morse W.J. (2015). *Managerial Accounting*. Cambridge Business Publishers. 7th Ed.

Citation Information: Böcskei, E., & Kis, V. (2020). Interplay of ERP and controlling –future business skills of entrepreneurship education. *Journal of Entrepreneurship Education, 23*(S2).

Ittner, C.D., & Larcker, D.F. (2001). Assessing empirical research in managerial accounting: a value-based management perspective. *Journal of Accounting and Economics, 32*(1-3), 349-410.

Kolmos, A. (2017). *PBL curriculum strategies: From course based PBL to a systemic PBL approach.* In PBL in engineering education, 1-12, Brill Sense.

Komarova, A., Tsvetkova, L., Kozlovskaya, S., & Pronkin, N. (2019). Organisational educational systems and intelligence business systems in entrepreneurship education. *Journal of Entrepreneurship Education, 22*(5), 1-15.

Kovalenko, K.E., Utyuzh, A.S., Iusupova, I.I., Plisova, A.B., Panchenko, N.B., & Kuznetsova, N.V. (2019). Practice-oriented approach in teaching entrepreneurship. *Journal of Entrepreneurship Education, 22*(5), 1-7.

Kozma T, Gyenge, B., & Tóth, R. (2015) Ellátási lánc controlling. *Controller Info 3*(3), 15-23.

Laudon, K.C., & Laudon, J.P. (2019). *Essentials of MIS*. Pearson. 13th Ed.

Morris, M.G., & Venkatesh, V. (2010). Job characteristics and job satisfaction: Understanding the role of enterprise resource planning system implementation. *Mis Quarterly, 34*(1), 143-161.

Morse, W.J. (Eds.). (2015). *Managerial Accounting*. Cambridge Business Publishers.

Munawaroh. (2018). The effect of problem-based learning (PBL) method on students critical thinking skiils on entrepeneurship practice course (A study on Economics Education Department in the College of Education and Teachers Training Pgri Jombang East Java Indonesia). *Journal of Entrepreneurship Education, 21*(1).

Pathak, S. (2019). Future trends in entrepreneurship education: Re-visiting business curricula. *Journal of Entrepreneurship Education, 22*(4), 1-13.

Prosser, A., Bagnato, D., & Müller-Török, R. (2017). *Integration management with SAP ECC.* Facultas.

Retreived from https://www.vik.bme.hu

Somers, T.M., & Nelson, K.G. (2004). A taxonomy of players and activities across the ERP project life cycle. *Information & Management, 41*(3), 257-278.

Swaramarinda, D.R. (2018). The usefulness of information and communication technology in entrepreneurship subject. *Journal of Entrepreneurship Education, 21*(3), 1-10.

Tóth, R., Kozma, T., Controlling in the supply chain, In Zoltán, A., Gábor, B., Imre, G., (Eds.) (2016). The hungarian economy and society in the globalizing world of the 21st century. 30, Békéscsaba Higher Education "anniversary conference

Umble, E.J., Haft, R.R., & Umble, M.M. (2003). Enterprise resource planning: Implementation procedures and critical success factors. *European Journal of Operational Research, 146*(2), 241-257.

Vinogradova, M., Konstantinov, V., Prasolov, V., Lukyanova, A., & Grebenkina, I. (2019). Level entrepreneurship-role in the digital economy, tendencies of improvement of the information support system. *Journal of Entrepreneurship Education, 22*(5), 1-12.

Website of Faculty of Electrical Engineering and Informatics, Budapest University of Technology and Economics

World Economic Forum. (2018). *The future of jobs report 2018*. Geneva: World Economic Forum. Geneva, Switzerland.

Zéman, Z., Bács, Z., Bán, E., & Fenyves, V. (2016). Evaluation of authentic or "misleading" accounting information in the comparison of international and Hungarian practice, *Controller info 3*, 52-57.

Citation Information: Böcskei, E., & Kis, V. (2020). Interplay of ERP and controlling –future business skills of entrepreneurship education. *Journal of Entrepreneurship Education, 23*(S2).