AI INFLUENCING E-LEARNING TO OPTIMIZE SKILLS FOR BUSINESS PROCESSES

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Abstract: *Artificial Intelligence (AI) is changing the way things are done, and there is a lot of hidden potential waiting to be discovered. Modern ERP (Enterprise Resource Planning) systems have implemented AI-enabled wizards for better utilization and advanced data analysis. AI creates space for the creativity of IT users, and the interest is in process mapping, detailed analysis of selected business processes, and searching for hidden relationships in data with subsequent interpretation of the results. IT users must have the necessary skills to solve needed activities. It is important that education reflects the current situation, and AI is also influencing learning to support optimal students' skills with information technology. This article focuses on changes in education supporting critical thinking and the ability of group work to learn more about different intelligences (AI, business or customer intelligence) that data is ready for optimal decision-making and the implementation of business processes. Practical work with students took place in the summer semester of the academic year 2022/2023. It involved teaching in groups, implementation of questionnaires in the teaching to find out current knowledge and opinions on the topics discussed with a retrospective evaluation of the benefit achieved in the learning process.*

Keywords: Artificial intelligence; E-Learning; ERP systems; information technology

INTRODUCTION

Artificial intelligence (AI) affects many activities in business processes as well as in education. A close connection is necessary between education and business processes needs. The reasons lie in the need to ensure task optimization and decision-making with sufficient variability and quality. The scope of business processes includes core

processes, support processes, management processes, and business process technology. It is important to have optimal business processes (The Extensive Guide to Business Processes for 2024, 2023) for:

- Clear communication and customer support.
- Identification tasks with links to business objectives.
- Improving their efficiency through the implemented tasks.
- Use available resources responsibility.
- Standardization of implemented processes.

In a global and digitized society, information technology and data have an important role to play in leading to technological transformation (de Mattos et al., 2023). From an information technology perspective, artificial intelligence is just one of several intelligences such as business, customer (Subramaniam, 2019), computational (Somnuk et al., 2017) or competitive (Competitive Intelligence for Business Growth, 2019) and swarm intelligence (Shethna, 2023). Their strength lies in supporting prediction to gain insight into current trends and the future development of monitored metrics. Contact with customers (Evenson, 2017; Dib, 2016) is unique for every business (Roy et al., 2023). It is about loyalty and the ability to continue with offers, services, and purchases (Keenan, 2018; Softclouds, 2018; Miller, 2017). Businesses face a challenging position here because customers are educated. They share their opinions and experiences of services and goods on the Internet, especially on social networks (Dollwet, 2019).

If a businessman wants to have a business solution and implemented processes, optimal knowledge is needed there. Optimal knowledge requires education, specifically long-term education and e-learning (Kuzior et al., 2023). Like other activities, e-learning uses information technology to support education. Again, there is pressure to maintain quality, variability and keep up with current trends that students have:

- More practical experience.
- More communication skills for working in teams.
- Greater variability in problem solving.
- Greater willingness to learn about innovations.

For these purposes, the interpretation with the support of teaching materials and subsequent practical seminars introduces students to the current perspective on the discussed topic, and the practical seminars support their experiences. This article is based on practical experiences from lectures with students during the academic year 2022/2023 for the operating systems course. The research question concerns the usefulness of implemented innovation for both students and teachers. The method is based on a literature review and practical work with students, followed by feedback. Integrated innovation focuses on group work on given topics, such as information technology for start-ups and various intelligences to support business processes. A partial component of the innovation involves conducting surveys to gauge students' current opinions on selected issues, thus fostering their interest in information technology and business processes. For more detailed research, there is a general hypothesis that the educational activities have the necessary potential to support students' curiosity and skills, enabling the appropriate implementation of IT for business processes with flexibility and in line with existing trends.

1. ERP AND IT SUPPORT OF IMPLEMENTED PROCESSES

For a modern company, a high-quality ERP (Enterprise Resource Planning) system is a key element without which the company cannot be managed successfully. Business support requires the development of an ERP system covering essential business processes, from business to production and finance. There is also a crucial need for production solutions and customer contact support. It is not uncommon for orders to consist of thousands of items that must be manufactured and delivered on time. Errors and delays in delivery can result in financial losses, additional costs and a damaged reputation.

ERP systems are divided into about 250 different types of software solutions (Mandziuk, 2023). They are classified according to characteristics such as:
- Cloud systems.
- Custom or hybrid systems.
- Generic or industry-specific systems.
- Systems for small, midsize, or large companies.

The most popular ERP systems (Johnson, 2023) are Sage 100cloud, Acumatica, Oracle ERP Cloud, Epicor Kinetic, SAP S/4HANA, Skubana, Microsoft Dynamics 365, Sage Business Cloud, Oracle NetSuite, SAP Business One, Dolibarr, BrightPearl, DELMIAworks, Odoo, JobBOSS.

2. VARIABILITY IN INTELLIGENCES

ERP systems collect company data, and it is natural that various intelligences are integrated. Well-known is business intelligence (Sharda et al., 2022), which analyzes stored data and creates dashboards to present ways in which data may be easily understood, identifying available opportunities. The current trend is AI (Faggella, 2020; Sentence, 2019; Unemyr & Wass, 2018), which performs and automates tasks that require human intelligence. This information technology is an indispensable part of ERP systems for speeding up various business processes. The integration of various intelligences into ERP systems leads to the evolution and formation of intelligent ERP systems (What is Intelligent ERP?, 2023; Brain Metrix, 2018; Sunnersjö, 2016) using analytical functions, cloud, machine learning (Market Business News, 2022), mobile technologies for real-time analysis, optimal support of decision making, up-to-date overview of the customer experience (Watts, 2018; Williams, 2014).

Another advantage is support of customer relations. ERP systems enable more accurate service, personalized offers and precise communication with customers. It is also about customer loyalty and integrating customer intelligence. In many cases, ERP and CRM systems (Meyers, 2023; The Leading Contact Centre Magazine, 2018; Ropponen, 2017; Kaushik, 2016) are linked by application programming interfaces (APIs). This integration has a necessary effect on the ability to be an excellent ERP system providing data processing and ensuring data accuracy. Well-known benefits of customer intelligence (Kaur, 2023) include improved customer retention, customer satisfaction, detailed customer data collection and analysis, personalized marketing, and knowledge of customer trends and interests. The key is the adoption of imple-

mented technologies that provide improved business processes, leading to greater profits and customer retention. And again, the need for education is emphasized.

3. EDUCATION AND ARTIFICIAL INTELLIGENCE AND IT

Education plays a key role in the optimal use of information technology, offering a wide range of applications and proven methods. In many cases, both IT users and students have difficulties choosing a suitable application with an optimal operating system background and using the full advantages of this information technology. A crucial aspect lies in the methods of implementation that support adaptive learning (Smyrnova-Trybulska et al., 2022) with a profound impact on the European Education Area (Klatt, 2023). Information technologies have an unlimited number of methodologies, methods and tools ranging from the simple to the complex. Some recommendations are integrated into applications and operating systems, but limited knowledge about them causes difficulties.

The operating systems course, as its name suggests, focuses on the structures of operating systems, providing students with the necessary background for handling installed applications. During the academic year 2022/2023, innovations were implemented to support critical thinking, teamwork and the exploration of new capabilities in information technology. Group work was integrated into the seminars, and students were given the opportunity to select two topics for collaborative problem-solving. The first topic centered on the hardware and software requirements for a start-up, while the second explored artificial intelligence and other intelligences that IT users may use. In both cases, students work in groups according to their preferences, with tasks that involved assigning roles within the team, designing solution plans, specifying their IT needs and conducting final evaluations.

From the teacher's point of view, the chosen business for a start-up as the first topic of group work was interesting. Students preferred an e-shop, food imports such as chlebik.cz, invoice processing services or the optimization of B2B SafeWorking business processes. For inspiration, educational materials were prepared that show successful start-ups (Raska, 2022) that create a new companies with business concept and potential for further growth. There were also examples of supported business processes and methods for selection of optimal software (Kodouskova, 2021). Examples of software were linked across different categories (Capterra, 2023) to show variability for:

- Prices (open-source, free, licences, payment by IT user number, amount of processed data, storage space size).
- Characteristics by selected category of software (CRM systems, chatbots, data mining, simulation, accounting, customer services, and many others).
- Support for operating systems (Windows, UNIX/Linux, Mac, Android, iOS, or cloud and server solutions).

The answers to questions about assigned roles in student teams, the perceived difficulty of the tasks, the limitations they encountered, and the uniqueness of their cooperation, as perceived by the students, are shown in Table 1.

Ta b l e 1. Answers to questions in individual groups

Question 1 about assigned roles in student teams	
Groups of students	Answers
1	manager, coordinator, speaker, writer and resource finder
2	owner, IT specialist, marketer, and manager
3	individul members had a responsibility about searching, writting and objections
4	individual work because an student does not wish to cooperate in group
5	no roles, students work based on equal rights together on needed activities
Question 2 about the difficulties in solving from the students' point of view	
Groups of students	Answers
1	specification business for start-up
2	communication in team, and searching optimal information
3	optimal composition of needed modules of selected ERP system with support
4	verifycation that designed plan is correct
5	all was easy, no difficulties
Question 3 about the limits of their work	
Groups of students	Answers
1	knowledge to select optimal application for start-up
2	badget, time and lack knowledge for expertise, regulations
3	time and badget
4	knowledge, time and unknown concepts
5	congestion, solving queries
Question 4 about the uniqueness of cooperation according to the students	
Groups of students	Answers
1	to have ability to implement IT in enterprises
2	precision, speed and loyalty of team members
3	diligence and interest in customer service
4	joint work in a team
5	the best cooperation with smart people

S o u r c e: Own work.

The students' final assessment of their satisfaction with the teaching was positive. The rating scale used was "agree", "rather agree", "rather disagree", and "disagree". See Table 2 for details.

T a b l e 2. Student satisfaction with teaching

Evaluation for operating systems course	
Evaluated criteria	Answers
the course was useful	rather agree
the conditions of graduation were clearly defined in the subject	rather agree
the subject was provided with quality teaching materials	agree
the lectures/tutorials were clear	rather agree
the seminars were useful for developing my knowledge and skills	agree

S o u r c e: Own work.

The operating systems course has been a longstanding component of the Bachelor's program in Management Informatics. In 2023, it was included as part of the new accreditation process. A total of 58 students were enrolled in the course. The students' ages were not available to the teacher, but they were primarily estimated to be around 20 years old. The survey was conducted from April 24, 2023 to August 31, 2023, with response rates varying from approximately 10% to 30%.

Innovations in education aim to support curiosity about information technology and the ability to search for optimal solutions. It is also an opportunity to explore one's own communication and argumentation skills with colleagues (other students). Accessing information from the internet is relatively easy, but the difficulty is the ability to think critically and apply it in a manner that aligns with multiple intelligences in the classroom (Armstrong, 2017). Innovative methods in education encompass various approaches, (Tran, 2023) such as:

- Case study solutions.
- Defense of the project.
- Group work.
- Professional essay.
- Research.
- Role playing.

The expected skills in this operating systems course encompass analysis, application, evaluation, memorization and understanding. The course included group work where students worked on assigned topics and then presented the solutions they had developed. Assessment concerned group performance rather than individual contributions, with groups formed randomly. From the teacher's point of view, highly valued skills included the ability to research, categorize and articulate information, justify the adopted solution and effectively express ideas in one's own words.

Additionally, the ChatGPT (Svitlyk, 2023) played a role in generating interest. Students were intrigued by its potential for crafting optimal questions to obtain relevant answers on specific topics. Some students used this application and gained experience in asking questions related to choosing operating systems according to specified needs and preferences, identifying the most suitable operating system according to required functionalities, and inquiring about well-known applications. The results were expected and ranked based on criteria such as compatibility, cost, functionality, personal preferences, security, support and user interface.

CONCLUSION

This article focuses on the significance of education in the context of business processes, particularly in understanding the optimal IT support provided by ERP systems. There are many solutions and a good orientation is needed. Current trends are leading to the integration of intelligences, such as artificial intelligence and business intelligence, resulting in the development of intelligent ERP systems. From the point of view of education, the focus shifts towards fostering critical thinking and the ability to research, categorize and articulate, justify accepted solutions and express oneself effectively in one's own words. It necessitates working in groups and precise communication using different roles. Additionally, AI also has an impact on education in optimizing skills for business processes. There is enough information, but the challenge lies in effectively working with it. For this purpose, an innovation in the form of group work was implemented during the seminars of the selected course. This approach also aimed to explore different intelligences, allowing students to investigate the various ways they can be implemented in IT. Particular interest was shown in ChatGPT, which served as a valuable source of information. The achieved benefit is that students had a positive impression of this form of work and the majority evaluating it as "agree" or "rather agree".

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