2023 Trend Report

Higher Education & e-learning in ASEAN

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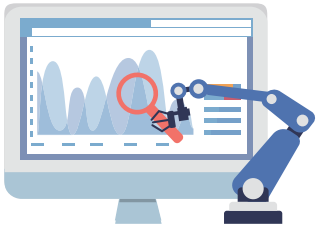
2023 Trend Report

Towards applying Robotic Process Automation for Vietnam higher education from the perspective of lecturers

#Process Automation #Robotic Process Automation #RPA #Higher Education

Mr. Chu Van Huy / Banking Academy of Vietnam



Higher education in Vietnam is facing challenges related to the increasing workload of administration, training and student support activities. This report provides a basic understanding, towards applying Robotic Process Automation (RPA) technology to support training activities from the perspective of lecturers.

01 What is Automation? What is the role of Robotic Process Automation?

In May 2022, we received an order for advanced digital competency training for lecturers at some universities in the northern part of Vietnam. After completing each course, we conduct an assessment of their digital competence at the end of the course based on The Digital Competence Wheel developed by Center for Digital Dannelse (survey conducted from May 27, 2022 - March 26, 2023). 282 lecturers participated in the above 8 courses, they have been participating in teaching at universities; they teach for many training systems such as doctor of philosophy, master, bachelor, college; they have experience in different pedagogical environments; they have accumulated rich digital capabilities. Through the survey results, we found that their weakest point is the ability to perform "automation".

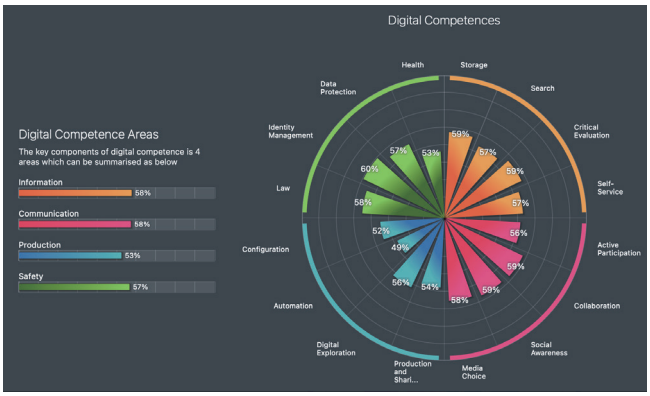


Figure 1.
Results of the survey on digital competences of lecturers at some universities in the North of Vietnam

Automation can be known as “The ability to create or modify digital solutions that can fully or partially automate a task”. For example, the process of automatically sending a student score notification to ensure privacy can be implemented as described in Table 1 below.

Step	Lecturers (Lecturers will use their eyes to see the data stream of student information prepared in the Excel File)	Automation solution (It will read the data stream of student information prepared in the Excel File)
1	Manually press compose Email button	Automatically press compose Email button
2	Manually type the email address of each student in the To field	Automatically type the email address of each student in the To field
3	Manually type the title of the student's score announcement to ensure privacy in the Subject field	Automatically type the title of the student's score announcement to ensure privacy in the Subject field
4	Manually type details about student's score in the Body field	Automatically type details about student's score in the Body field
5	Manually press the Send Email button	Automatically press the Send Email button

Table 1. An example of a comparison between manual tasks and automation tasks

Thus, if schools want to reduce the above weaknesses, they need to step-by-step improve their ability to implement "automation". Figure 2 describes the levels of automation capabilities that schools can aim to achieve. In fact, most of the lecturers who conducted the above survey are at level 2. [1]

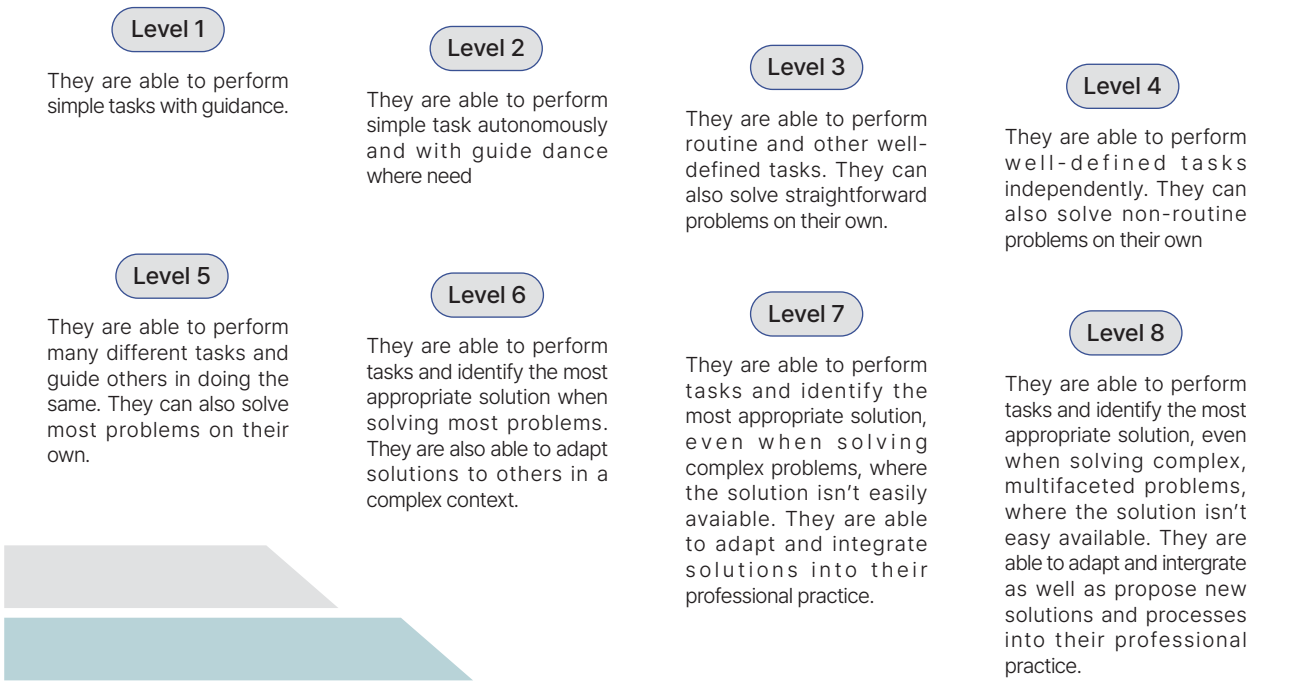


Figure 2. The levels of automation capabilities that schools can aim to achieve

So how can teachers improve automation capacity? The right solution that can be chosen is to use RPA. RPA has become a buzzword in discussions of disruptive technologies that can be used in the fourth industrial revolution, seen as a technology that enhances automation capabilities in many fields. RPA is understood as the use of special software programs commonly known as software robots (Software Robots, SoftBots or Bots) as a "virtualized workforce" to perform routine tasks of humans. The basic principle that allows RPA to replace humans is to mimic the repetitive tasks of human manipulating computer systems.

Implications

The first job that needs to be done is to discover, identify and evaluate whether specific tasks (tasks that interact with the computer system) in the business process of staff can be performed by automation? And then, it can be solved by RPA solutions (RPAs) to help reduce time and effort, increase the level of user satisfaction, spend time optimizing processes and create a lot of new valuable knowledge.

03

Suggest some use cases using RPA for Vietnam Higher Education from the perspective of lecturers

For lecturers, one of the key tasks is to do well in teaching and supporting students. In order to reduce the workload, trainers will need to prepare the ability to automate some tasks when interacting with computer-based information systems. Immediately after that, it is necessary to carefully arrange the implementation steps towards maximizing the steps that can be automated based on the use of RPA technology. Table 2 describes some useful experimental cases of applying RPA solutions for Vietnam higher education from the perspective of lecturers. [2], [3], [4].

Table 2. An example of a comparison between manual tasks and automation tasks

Use case	Interacting with the System	Description	Step-by-Step Process for RPA solution (RPAs)
Send academic alerts to each student	Email	RPAs can be used to automatically send a number of privacy-related student alerts, such as: • Send a warning about the number of days allowed to be absent by school rules. • Send reminders for missing documents. • Send reminders about the upcoming exams. • Send a private message to each student via Email. • Send each student's private scores via Email. • Etc.	• Step 1 RPAs automatically scan Excel File with data to send warning information related to students (unified put File containing data to be sent in a certain folder). • Step 2 RPAs read the data fields in the Excel File. • Step 3 RPAs automatically open the composing feature and fill in the corresponding fields in the Excel File in the fields (To, CC, Subject, Content). • Step 4 RPAs automatically press the button to send email notifications to students.
	→ Experimental location: In classes taught by the author at Banking Academy of Vietnam, National Economics University, East Asia University of Technology. → Experimental scale: 12 classes (average 50-70 students/class), academic year 2022-2023. → Evaluation of experimental results: Students feel satisfied when receiving notices, reminders, warnings,... proactively from the lecturer.		

Use case	Interacting with the System	Description	Step-by-Step Process for RPA solution (RPAs)
Analyze course information related to each student on LMS system	LMS, Email	RPAs can be used to automatically update & statistics student data on LMS online classes such as: • Attended class? • Submitted assignments? • Did the test? etc. After that, the system will automatically send notifications to the lecturer about abnormal data (the students took a lot of leave, didn't do the homework, ...) or periodically report information via Email.	• Step 1 RPAs automatically log into the LMS system. • Step 2 RPAs automatically access and collect student data in each course on the LMS. • Step 3 RPAs automatically aggregate and compile data (students attending classes, frequency of system access, assignment submission status, test execution status, ...) on the LMS system into an Excel file. • Step 4 RPAs automatically open the Email composing feature and fill in the necessary information fields (To, CC, Subject, Content, attach the summary Excel file). • Step 5 RPAs automatically press the button to send Email to notify lecturers about abnormal or periodic data via Email.
	→ Experimental location: Data collection activities in LMS online classes that the author teaches at Banking Academy of Vietnam, National Economics University, East Asia University of Technology. → Experimental scale: 12 classes (average 50-70 students/class), academic year 2022-2023. → Evaluation of experimental results: Lecturer feel more proactive in detecting weak students in the class in real time. Thereby quickly reminding, warning and motivating students to help them study better.		
Send surveys and get student feedback	Web-based System, Email	RPAs can be used to automate the process of submitting surveys, collecting and analyzing student feedback related to the teaching activities in each lesson and class. By automating this process, the lecturer can save time and resources, reduce errors, gain a better understanding of the student's experience, and make adjustments to the scenario and teaching content more appropriate.	• Step 1 Lecturer designs the survey form on the Web-based System (Google Form, Microsoft Form, etc.). • Step 2 Lecturer completes updating the Excel File containing the survey link, the list of students who needed to take the survey (unify to put the File containing the data to be sent in a certain folder). • Step 3 RPAs read the data fields in the Excel File. • Step 4 RPAs automatically open the composing feature and fill in the corresponding fields in the Excel File in the fields (To, CC, Subject, Content).

			• Step 5 RPAs automatically press the button to send survey Email to students. • Step 6 RPAs automatically access the Form system on the Web-based System, export student feedback data into Excel File. • Step 7 RPAs automatically open the Email composing feature and fill in the necessary information fields (To, CC, Subject, Content, attach the summary Excel file). • Step 8 RPAs automatically press the send Email button to notify lecturers of student survey results.
	→ Experimental location: Collecting feedback data on students' understanding of each lesson in classes that the author teaches at Banking Academy of Vietnam, National Economics University, East Asia University of Technology. → Experimental scale: 12 classes (average 50-70 students/class), academic year 2022-2023. → Evaluation of experimental results: Lecturer feel more proactive in monitoring the understanding and knowledge acquisition of each class in real time. Thereby, the lecturer can adjust the speed and content of the lesson to suit the characteristics of each class. As a result, students can absorb the best knowledge.		

In addition, the study of other useful RPA use cases can be applied for Vietnam higher education such as: automatically grading assignments, automatically entering grades into the training management system, automatically answering students' common questions, automatically collecting students' emotions on social networks,... will help reduce the volume and improve the quality of the lecturer's work. Determining how to apply automation technology for lecturers is very important if you want to minimize the weakness of automation in training activities.

The next challenge to be solved are specific instructions on what tools to use, how to do it, how to deploy,... to perform each automation task planned by the lecturer.

Implications

The challenges facing for Vietnam higher education described above may also be challenges for higher education in other countries. Identifying weaknesses in automation capabilities, discovering the possibility of automating a number of tasks from simple to complex, forming process thinking, step by step towards applying Robotic process automation in solving work is the expectation that the author wants to convey.

References

Phan, T. D., Nguyen. T. T. (2023), Report for Classes on The Digital Competence Wheel, https://digital-competence.eu/dc/report/?uri=8aa8546eeee0c7a94a9597f630038c5f (accessed 26 March, 2023).

Chu, V. H., & Pham, X. L. (2022), RPA application to promote automation in training management, International Conference Proceedings: "Digital Transformation in the Context of Industry 4.0", https://www.researchgate.net/publication/368892293_Ung_dung_RPA_nham_thuc_day_tu_dong_hoa_trong_cong_tac_quan_ly_dao_tao (accessed 01 April, 2023).

Munawar, G. (2021), Bot to monitor student activities on E-Learning system based on Robotic Process Automation, https://www.researchgate.net/publication/355356972_Bot_to_Monitor_Student_Activities_on_E-_learning_System_Based_on_Robotic_Process_Automation_RPA (accessed 01 April, 2023).

Bardia Eshghi (2023), Top 16 Use Cases of RPA in Education in 2023, https://research.aimultiple.com/rpa-education (accessed 01 April, 2023).

The Growing Popularity of Nano-learning in National Economics University

#Nano-learning #learning-method

Pham Xuan Lam, Le Thi Hoai Thu, Tran Thi My Diep, Pham Duc Trung / NEU

A learning approach known as Nano-learning involves delivering material in quick-to-understand, small, easily digestible chunks. Nowadays, students prefer Nano-learning since it is brief, simple, and always available, which may make them less eager to participate in lengthy and complex courses or lessons. This article presents the status and prevalence of Nano-learning within our school - National Economics University in Vietnam.

01 Introduction

Nano-learning is referred to bite-sized learning (Aburizaizah & Albaiz, 2021). Based on the concepts of nanotechnology, Nano-learning uses discrete, compact, and cohesive units (Khlaif & Salha, 2021). The learner gains knowledge without spending an excessive amount of time because it is a continuous learning process. Nano-learning offers condensed learning modules with the most valuable information accessible, for instance, a two-minute conversation with a topic specialist will clarify any confusion and raise the learner's knowledge quotient. Shorter contents are much easier to remember because the human brain does not tire of long courses and interaction with the lecturer (Karlén Gramming, Ejemyr, & Thunell, 2019).

In the current days, social media platforms are showing a trend toward shorter content. With over two billion monthly users, YouTube is the most popular video-sharing website, but viewers are shifting to TikTok for even shorter, snappier, as well as more nano content. Because Tiktok is a short-form, entertainment-focused SNS, its popularity has sparked an increase in interest in researching consuming habits and usage motivations (Garcia, Juanatas, & Juanatas, 2022). As a result, it offers development to the idea of Nano-learning. Since students have a short attention span, the method focuses repetitive learning, which is ideal for modern education and Generation-Z.

Recent research has acknowledged the importance and significance of Nano-learning in education. Nano-contents should be created as an introduction to any new subject area as well as repetition for the main feature of education during each class or throughout the entire learning period (AL-SHEHHI, 2022). Learners can also refer to links or videos whenever they need additional information or knowledge to support their new learning. This preference is consistent with Nano-learning principles, which contributes to nano-growing education's popularity among the younger generation.

Despite its importance, there are limited studies on using Nano-learning in higher education. There are two main factors which will be introduced in next the section: current situation of Nano-learning in Vietnam higher education (which explains why and how students use Nano-learning to support their study); and their opinion about it. Those result are surveyed students who are currently studying at National University of Economics in VietNam.

Implications

Nano-learning can be a useful tool for repetitive learning, which is ideal for modern education and Generation Z, who have shorter attention spans.

02

Nano-learning in National Economics University in Vietnam

The research team conducted a short online survey of students from a well-known economic university in Vietnam – NEU (National Economic University). The survey was conducted with 213 students, both male and female, aged from 18 to 22. The result shows the data about the use of nano learning in three aspects: (1) used tools and applied subjects; (2) Purpose, object, and method of using Nano-learning, (3) The benefit of Nano-learning. The results show that out of 213 students, 141 students (66.2%) confirmed that they have used Nano-learning applications for studying

The obtained data indicates that the tools which support nano learning method are very diverse, which can be listed as: Duolingo, Cake, Quizlet, Kahoot, Anki, Tinycards, Memorise, Elsa, Mochi, Youtube, Tiktok, Instargram, Facebook... (Students are allowed to choose many applications). The best choices are for applications such as Duolingo, Quizlet, Kahoot accounting for over 70%. This is followed by social networking applications with 59% and other applications such as Elsa and Cake, with 46% and 44% respectively. Other applications are only used by less than 1-10% students.

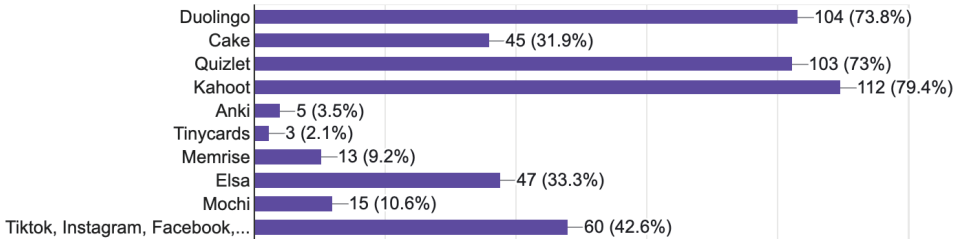


Figure 1. The popularity of Nano-learning tools

In addition, the main applied subjects are English, Math, Science, History, Art, ... and English accounts for the majority 98% of students., followed by percentage for math, science, history, and art with 35%, 29%, 27% and 19% respectively. The remaining subjects such as programming, informatics, marketing, psychology, and economics account for a very small proportion, with each of them being less than 1%.

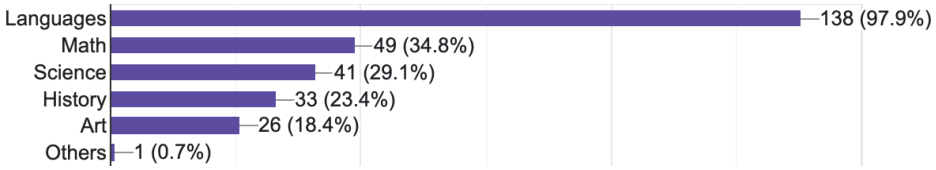


Figure 2. The subjects commonly used in Nano-learning

According to the main subjects applied being English, the purpose of improving listening and speaking skills, vocabulary, and grammar accounts for a significant proportion over 60%. Purposes related to entertainment and passive learning are high at 52%. This is followed by goals related to knowledge of the final exam at 46% and living skills at 38%. Other objects occupied negligible percentages. A vast majority of students found that nano learning method is suitable for the goal of memorizing new words and pronunciation (69%) or learning new concepts in a small field (56%). A large percentage of students choose to match the goal of learning new knowledge and skills (46%) or solving simple exercises (33%). Self-study is the dominant form of nano learning methods accounting for 91%. This method of learning is chosen by teachers with the rate of 27%. This is not a small percentage, which proves that nano learning is likely a personalized learning trend and this trend is introduced by teachers in higher education.

In addition, the collected data confirm the benefits of Nano-learning method. Specifically, 28.4% of the students affirmed that the Nano-learning method is very useful and useful. The percentage of students who made a relatively useful choice was 52.5%. However, there is a small rate of students who are uncertain about the usefulness of Nano-learning methods, accounting for about 17%. One positive thing is that the negative rate of Nano-learning methods is almost non-existent around 1%. Although the collected data is not large, this result is a clear demonstration of Nano-learning method's usefulness (see the below Figure)

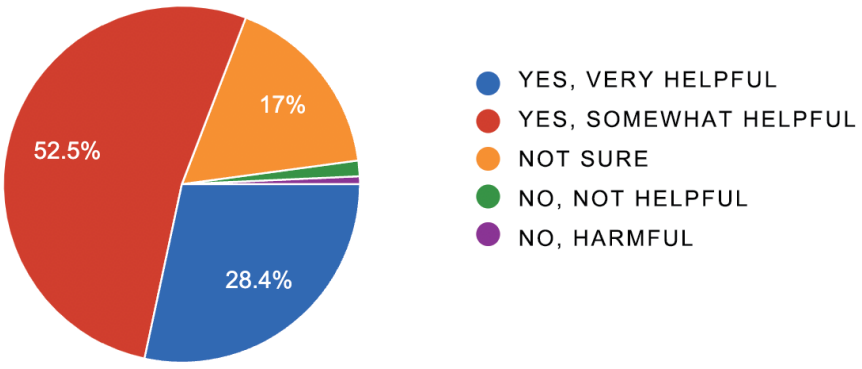


Figure 3. The usefulness of Nano-learning

Implications

Firstly, the findings indicate that Nano-learning applications have a high adoption rate among students in higher education. This suggests that educators should consider incorporating Nano-learning methods into their teaching practices to improve students' learning experiences. Secondly, the diverse range of tools used for nano learning highlights the importance of providing students with a variety of options to suit their individual learning preferences. This can include both traditional and non-traditional tools, such as social media applications. Thirdly, the dominance of English as the primary subject for nano learning suggests that educators should focus on providing more opportunities for students to improve their language skills. Additionally, the high proportion of students using Nano-learning for entertainment and passive learning purposes indicates that educators should consider incorporating gamification elements into their teaching practices to increase student engagement. Fourthly, the data on the benefits of Nano-learning, including its usefulness for memorizing new words and learning new concepts, further supports the adoption of Nano-learning methods in higher education.

03

Student's perspective of Nano-learning

The first part of this study showed that students knew quite well about Nano-learning application tools. They used these apps for various purposes such as self-studying English or improving soft skills. In the second part of our study, we investigated students' perceptions of the effectiveness and appropriateness of Nano-learning applications that students used.

There are 3 aspects of the benefits that apps bring to students in learning considered in our research. Include:

Time saving (compared to traditional learning).
Better concentration/focus and access to knowledge.
The convenience and flexibility of using Nano-learning applications.

Respondents will rate their Nano-learning app based on a scale of 6 levels, including: “Very helpful”, “Relatively helpful”, “Not sure”, “Not helpful”, “Easy to waste time" and “Harmful”.

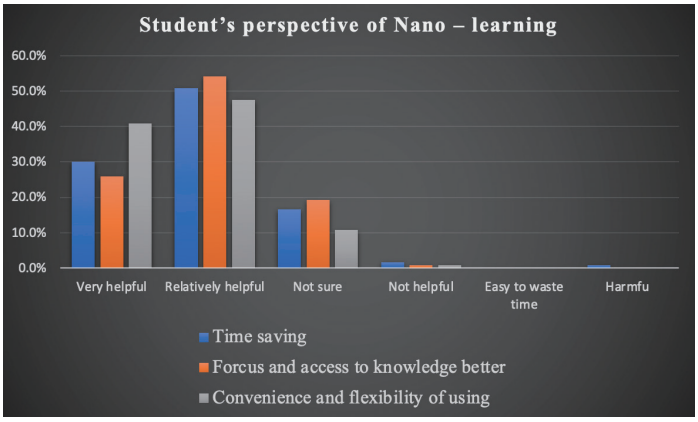


Figure 4.
Student's Perspective of Nano-learning

According to findings, most students know the advantages of Nano-learning applications and consider them useful. Most students surveyed said that apps help save learning time compared to traditional learning methods. (30% "very helpful" and 50.8% "Relatively helpful"). 40.8% of the students surveyed think that these apps are convenient and flexible to use and 47.5% find them "Relatively helpful". It is quite a high rate within the appropriate percentage of 50,8 respondents who think that Nano-learning applications help them focus and access knowledge better. In addition, one-sixth of the respondents found it especially useful. Meanwhile, the respondents who disagree with benefits of Nano-learning apps (within all 3 aspects) only account for an extremely low percentage (~1%).

The findings also show that more than 83% of students give positive feedback about continuing to use Nano-learning applications to support their learning process. However, the remaining 17% of students are not sure or think they will continue to use these applications.

From this survey's results, it can be concluded that most students have a positive assessment of the usefulness of Nano-learning applications and are willing to continue using them to improve their learning efficiency.

Implications

The study highlights that students perceive these applications as timesaving, convenient, flexible, and helpful in improving their focus and accessing knowledge. This suggests that the use of Nano-learning applications can be an effective supplement to traditional learning methods. Additionally, the study shows that most students have a positive perception of Nano-learning applications and are willing to continue using them to support their learning process. Therefore, it can be suggested that educational institutions can integrate Nano-learning applications into their teaching methods to enhance students' learning experiences and increase their engagement.

04

Summary

In conclusion, Nano-learning has gained popularity in modern education due to its easily digestible and brief approach. This article presents a study conducted among students at National Economics University in Vietnam, aimed at understanding the status and prevalence of Nano-learning. The study shows that a significant number of students (66.2%) have used Nano-learning applications for studying, with English being the most studied subject. The results also indicate that Nano-learning is perceived as suitable for repetitive learning, memorizing new words and concepts, and solving simple exercises. Self-study is the dominant form of Nano-learning, with teachers also introducing this trend in higher education. The study underscores the importance of integrating Nano-learning in higher education to cater to the needs of modern students and provide personalized learning opportunities.

Implications

As technology continues to shape the way we learn, we must adapt and incorporate innovative teaching methods to ensure that students are receiving the best possible education. The use of Nano-learning is one such method that can help to achieve this goal.

References

Aburizaizah, S. J., & Albaiz, T. A. (2021). Review of the Use and Impact of Nano-learning in Education. Paper presented at the 4th International Conference on Research in Education.

AL-SHEHHI, M. (2022). The use of Technology in Education: A Study About the Impact of Using Nano-learning in Teaching English as A Foreign Language in Higher Education Institutions in the United Arab Emirates. The British University in Dubai (BUiD),

Garcia, M. B., Juanatas, I. C., & Juanatas, R. A. (2022). TikTok as a Knowledge Source for Programming Learners: a New Form of Nanolearning? Paper presented at the 2022 10th International Conference on Information and Education Technology (ICIET).

Karlén Gramming, A.-C., Ejemyr, E., & Thunell, E. (2019). Implementing Nano-learning in the Law Firm. Legal Information Management, 19(4), 241-246. doi:10.1017/S1472669619000562

Khlaif, Z. N., & Salha, S. (2021). Using TikTok in Education: A Form of Micro-learning or Nano-learning? Interdisciplinary Journal of Virtual Learning in Medical Sciences, 12(3), 213-218. doi:10.30476/ijvlms.2021.90211.1087

Exploring Students' Usage, Preferences, and Perceptions of AI-based Apps in National Economics University (NEU)

#AI-based apps

Pham Xuan Lam, Le Thi Hoai Thu, Tran Thi My Diep, Pham Duc Trung / NEU

The rapid advancement of Artificial Intelligence (AI) has led to its widespread use in education, with applications like OpenAI's ChatGPT gaining popularity for their human-like responses. However, concerns about AI-assisted cheating and responsible use have also emerged. This paper presents insights from a survey conducted at National Economics University (NEU) in Vietnam, exploring students' usage, preferences, and perceptions of AI-based applications. The survey revealed that a significant percentage of students had used AI-based applications, primarily for tasks such as information lookup, assignments, and programming. The most popular AI-based applications included ChatGPT, Duolingo, Notion AI, and Elsa Speak. The findings indicate positive student perceptions and a willingness to continue using AI-based applications in their studies.

01 Introduction

Artificial Intelligence (AI) has advanced quickly in recent years, leading to numerous uses in a variety of fields, including healthcare (Xu, Sanders, Li, & Chow, 2021) and education (Zawacki-Richter, Marín, Bond, & Gouverneur, 2019). Massive amounts of data can be used to teach AI systems how to simulate the human brain and perform regular tasks. Applications of artificial intelligence have been used in education to improve administrative and academic assistance (Zawacki-Richter et al., 2019). An interactive chatbot called ChatGPT, recently developed by OpenAI ("OpenAI,"), might make it much easier for instructors to incorporate AI into their lessons. To provide responses that are human-like to user input, ChatGPT implements Natural Language Processing (NLP). It has drawn interest from across the world because of its excellent performance in producing answers that are solid, orderly, and instructive (Zhai, 2022). The results show that this AI-based application is capable of receiving a university degree (Bates, Cobo, Mariño, & Wheeler, 2020) and also can pass graduate-level business and law exams (Kelly, 2023), even though its scores weren't very good at this point. ChatGPT has experienced the fastest user application growth in history since its release on November 30, 2022, and just two months later, in January 2023, it had 100 million active users (Zhou, Ke, Qiu, Huang, & Zhang, 2023).

Despite its popularity, ChatGPT and AI-based software in general have created significant difficulties and risks for the educational system. There are concerns about AI-assisted cheating because it can be used to produce written assignments and exams on behalf of students and can respond specifically to user questions. The implications of ChatGPT and AI-based application in the field of education were explored (Lim, Gunasekara, Pallant, Pallant, & Pechenkina, 2023; Mhlanga, 2023). Different publications about Generative AI tools were analyzed, and the results showed that instructors were worried about using them in the classroom. Because AI-based applications can quickly produce appropriate texts, they raised concern that students would utilize it to outsource their work. As a result, researchers emphasized the significance of using AI-based applications responsibly and ethically. Several problems were identified with the studies, including plagiarism, wrong replies, and inaccurate citations. Therefore, it is necessary to give special attention to the effects of AI-assisted learning to maximize its advantages and minimize its disadvantages.

The reasons and methods by which students use AI-based applications to support their academic or professional activities, and their opinions about those applications, will be covered in more detail in the next section. The results are from a survey of current students at National Economics University (NEU).

Implications

The rapid advancement of Artificial Intelligence (AI) has led to its widespread use in education. AI systems, powered by extensive data, can simulate human brain functions, and perform various tasks. OpenAI's ChatGPT, an interactive chatbot, has gained popularity for its human-like responses and instructive nature. However, AI-based software, including ChatGPT, has also raised concerns in education, such as the potential for AI-assisted cheating and the need for responsible use.

02

Usage and Preference of AI-based applications among Students

The data was conducted in a short online survey with students majoring in Management Information Systems (MIS), Computer Science (CS), and Information Technology (IT) of National Economics University (NEU). There were one 110 responses collected, 25% of which confirmed that they had used applications related to AI, while 15% have not used AI-based applications. A significant percentage has not given a clear affirmation. The result shows that 61% choose another option in this question. When research team do further study with specific questions, the response rate about AI-based applications increased markedly. 91/110 responses were established and divided into 3 main aspects:

- Type of AI application used
- Using of specific AI-based applications
- Purpose of using AI-based applications

The research team has listed some types of AI-based applications that are suggested to students such as: Automatic translation tool, create and analyze text, online learning app, audio and video creation tools, outfit, and style suggestion app... , and much feedbacks confirm that they have been using these applications. Even many students also selected multiple types of applications at the same time. Among the types of applications used, the automatic translation tool was the most chosen by students 67 respondents used this application. AI-based online learning apps took 2nd place with 47 responses. This is followed by applications to create and analyze text, audio and video creation tools, and outfit and style suggestion app. A handful of responses suggested other types of applications including personalized education app, virtual assistant, chatbots.

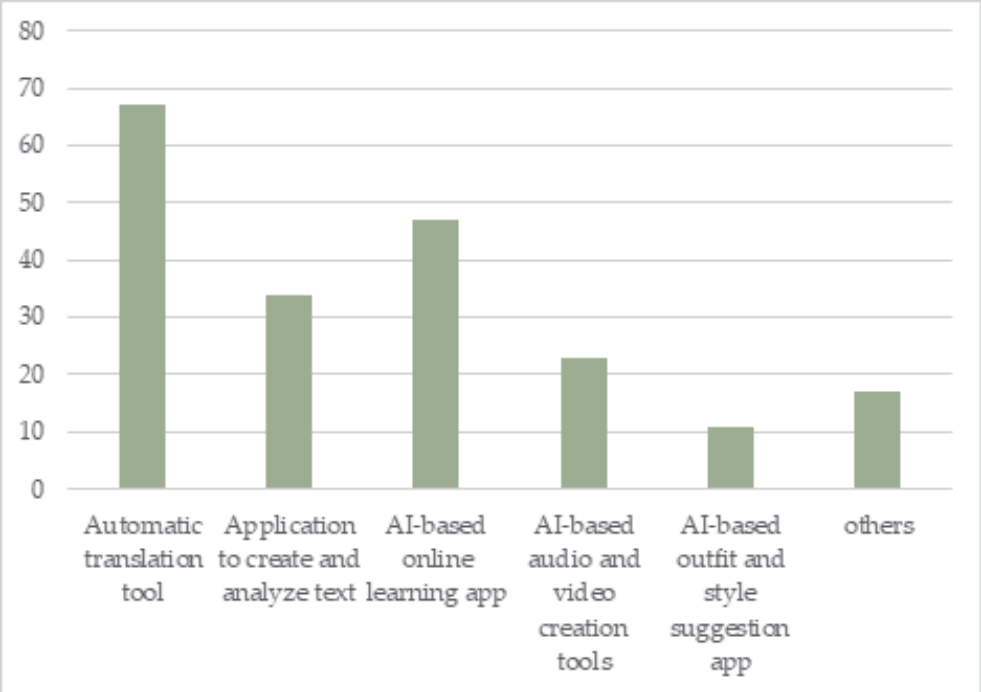


Figure 1. Type of AI-based applications

Besides the research team carried out more detailed research with some popular AI-based applications including Notion AI, ChatGPT, Grammarly, Duolingo, Elsa Speak and so on. The results obtained from 91 responses, Chat GPT applications was used the most with a count of 49 responses. It is an emerging AI application that are selected and used by students. This is followed by the Duolingo with 42 responses. The next rankings are Notion AI with 37 responses and Elsa speak with 31 selections. Midjourney, Grammarly, QuillBot are the next students' choice and all of them are above 20 selections. A small number of other students choose Anki, Brainly, Stepwise Math and Kaltura to support their working and learning.

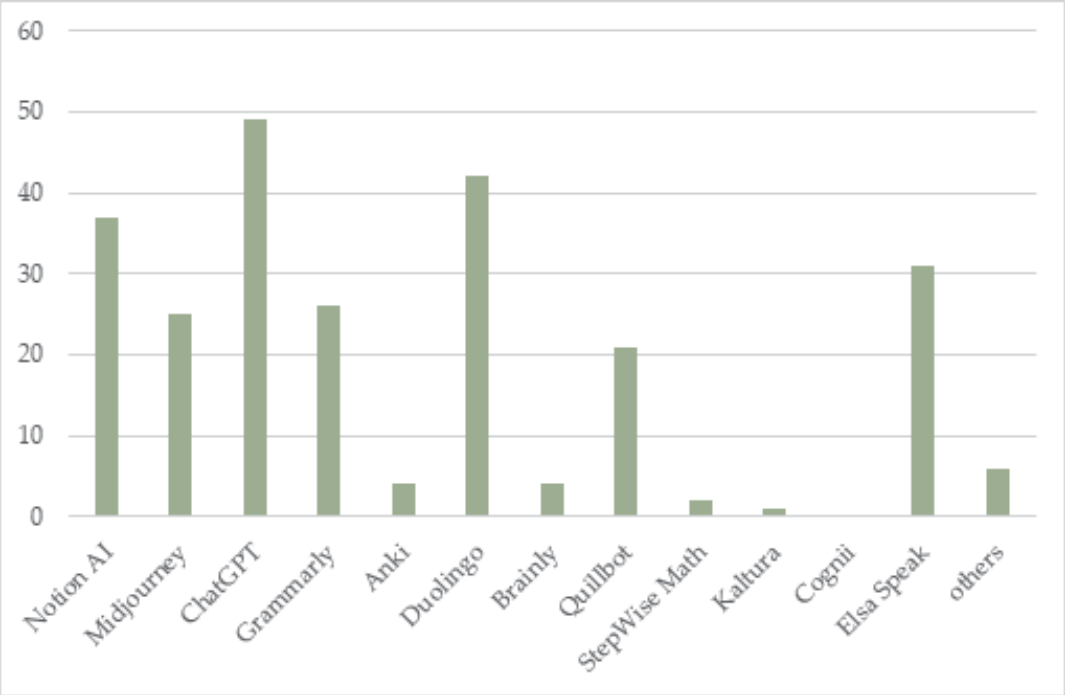


Figure 2. Using of specific AI-based applications

In addition, the purpose of using AI-based applications is still studied. All most respondents use AI-based applications to look up information and documents (78/91 responses). Many of them also have the purpose of doing assignments and submitting assignments with 55 selections. Furthermore, many students used AI-based applications to program with 39/91 responses. This may be logical as the survey's objects are students of Computer and Technology major and study many subjects relates to programming. The number of students responding to the purpose of using it to prepare documents and reports accounted for 35 responses. This is also one of the students' learning activities. Besides a plenty students use AI-based applications for image and video processing - 29 choices or composing purposes - 11 choices.

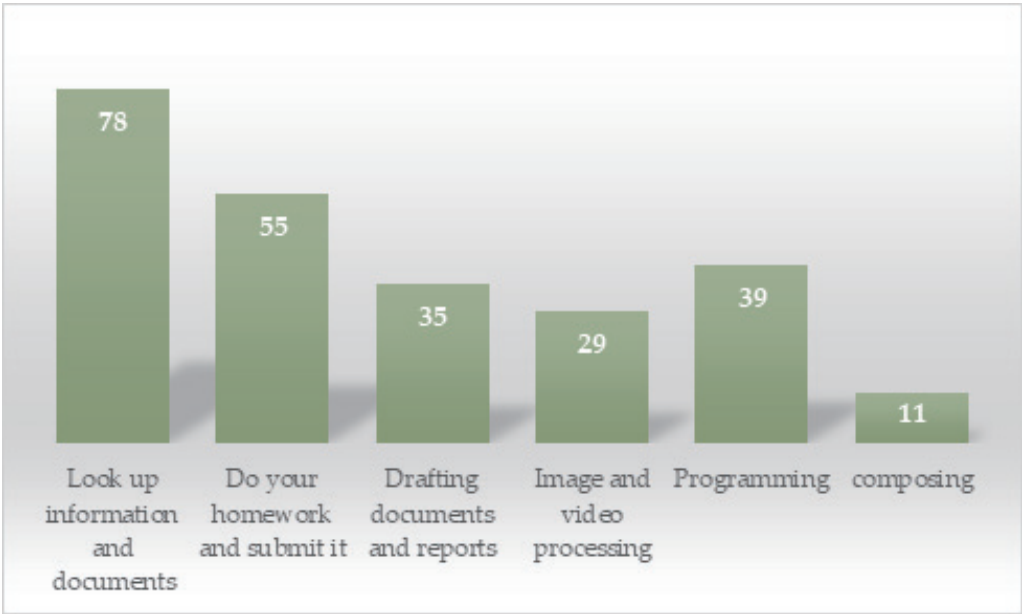


Figure 3. Purpose of using AI-based applications

Implications

Students in National Economics University in Vietnam have used a diverse range of AI tools, including translation, online learning, and text analysis applications. Popular choices include ChatGPT, Duolingo, Notion AI, and Elsa Speak. Students primarily use AI apps for information lookup, assignments, and programming. Suggestions for improvement include better verification, database updates, and user-friendly interfaces. Overall, the survey highlights positive student perceptions and a willingness to continue using AI-based applications in their studies.

03

Exploring Students' Perception and Assessment of AI-based applications

The first part of this report showed a rich number of AI-based apps used by students at National Economic University (NEU). The AI-based apps are mostly used to learn English, especially to improve speaking and writing skills. Another major purpose when using smart apps is to look up insights, a good example for this is Chat GPT. This report maintain research meaning of AI-based apps under students' outlook. Our survey showed that students' perception of this type of application is very good. The students agreed that AI-based applications helped them improve their work and study performance (approximately 94%). A similar percentage of students (about 92%) also said that using an AI-related application helps them to shorten time to complete work.

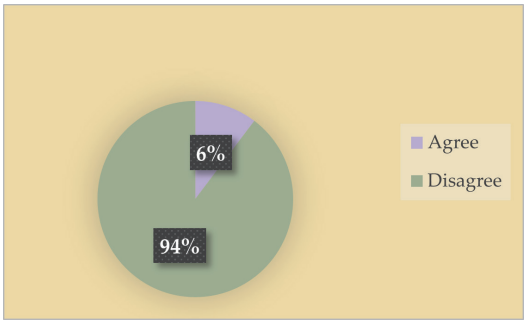


Figure 4. Improve their work and study performance

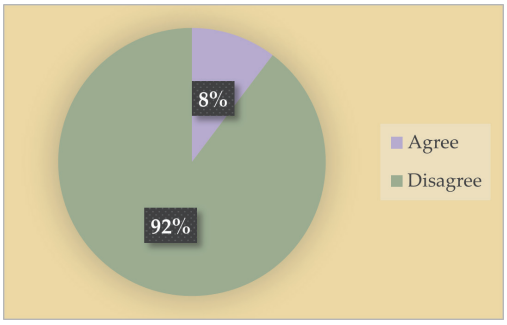


Figure 5. Shorten time to complete work.

This report also explores in-depth students' assessments when using AI-based apps. Some detail results are list in Table 1. Specifically, for translation support or natural language processing tools (such as Google translate, Grammarly, ...) which are evaluated as fast processing speed, the output is quite good.

Chat GPT is an AI-based apps tool that is currently a new trend in Vietnam. This is a tool that combines search and natural language processing quite effectively. Most students who use Chat GPT appreciate the convenience of this tool. Some significant comments are "fast speed", "wide search areas", and "easy to use".

Although this survey pointed out the advantages of AI_ apps, these tools have disadvantages. Some of them are unverified search findings (for GPT Chat) and poorly structured answers (for automatic translation tools).

Table 1. Evaluation of the features of the AI-based apps

ChatGPT	Fast processing speed Pretty accurate answer Must check the answer again The Vietnamese version has many wrong answers Easy to use
Grammarly, Google Translate...	Good quality Convenient Free The structure of the sentence is wrong Easy to use
Duolingo, Elsa Speak, Notion AI...	Good quality Convenient, Improve skills Useful for work and study Easy to use Support for job

Implications

It is a fact that there is no one best solution for all applications. Each application has both strengths and weaknesses. These are some suggestions on solutions to improve features of AI- based applications:

- Information search results need to be better verified
- The information in the database needs to be updated (e.g., the code in GPT's answer is 2021 only).
- User interface should be designed more friendly (for GPT)
- Understand more about the language and context (especially Vietnamese) to give more correct answers.
- Should have a low-cost policy for student accounts

As a finding of this report, it can be concluded that almost students have a positive perspective of the usage of AI-based applications, and they are willing to continue using them in study at university.

04

Summary

The survey conducted at the National Economics University (NEU) provided valuable insights into students' usage and perception of AI-based applications. The results demonstrated a diverse range of AI tools being utilized, with a focus on language learning, information retrieval, and text analysis. Students reported positive experiences with AI-based applications, acknowledging their ability to enhance work and study performance while reducing completion time. However, limitations were identified, such as unverified search results and poorly structured answers in some AI tools. Recommendations were made to improve AI-based applications, including better verification of information, regular database updates, user-friendly interfaces, and language contextual understanding. Overall, the survey highlighted the positive impact of AI-based applications on student learning and the importance of continuous improvement to maximize their benefits.

Implications

The diverse range of AI tools utilized, particularly in language learning, information retrieval, and text analysis, showcases the potential of AI in various educational aspects. However, limitations like unverified search results and poorly structured answers need to be addressed.

References

Bates, T., Cobo, C., Mariño, O., & Wheeler, S. (2020). Can artificial intelligence transform higher education? International Journal of Educational Technology in Higher Education, 17(1), 42. doi:10.1186/s41239-020-00218-x

Kelly, S. M. J. C. B. (2023). ChatGPT passes exams from law and business schools. 26.

Lim, W. M., Gunasekara, A., Pallant, J. L., Pallant, J. I., & Pechenkina, E. (2023). Generative AI and the future of education: Ragnarök or reformation? A paradoxical perspective from management educators. The International Journal of Management Education, 21(2), 100790. doi:https://doi.org/10.1016/j.ijme.2023.100790

Lo, C. K. (2023). What Is the Impact of ChatGPT on Education? A Rapid Review of the Literature. 13(4), 410. Retrieved from https://www.mdpi.com/2227-7102/13/4/410

Mhlanga, D. (2023). Open AI in Education, the Responsible and Ethical Use of ChatGPT Towards Lifelong Learning. SSRN Electronic Journal. doi:10.2139/ssrn.4354422

OpenAI. Retrieved from https://openai.com

Xu, L., Sanders, L., Li, K., & Chow, J. C. J. J. c. (2021). Chatbot for health care and oncology applications using artificial intelligence and machine learning: Systematic review. 7(4), e27850.

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. J. I. J. o. E. T. i. H. E. (2019). Systematic review of research on artificial intelligence applications in higher education–where are the educators? , 16(1), 1-27.

Zhai, X. J. A. a. S. (2022). ChatGPT user experience: Implications for education.

Zhou, J., Ke, P., Qiu, X., Huang, M., & Zhang, J. (2023). ChatGPT: potential, prospects, and limitations. Frontiers of Information Technology & Electronic Engineering. doi:10.1631/FITEE.2300089

A systematic evaluation for the development of online assessment systems at HUST in the COVID-19 pandemic

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The global COVID-19 pandemic has significantly impacted education worldwide, affecting all levels of learning. As a result of the abrupt shift from traditional classroom teaching to online platforms, teachers and students were forced to quickly adapt to this new method of teaching and assessment methodology. Due to the limitations of the IT infrastructure of higher education institutions in general and of HUST in particular, it is challenging to build a comprehensive examination system immediately during the COVID-19 pandemic. It needs a total solution and a combination of different ways to meet the output learning standard requirements and various types of exam methods as well as supporting multiple exam takers fairly.

In this report, we analyze and evaluate the specific needs of both teachers and students to deploy online assessment systems adapt to output learning standards and HUST conditions. The systems had been implemented in practice for HUST since the spring semester of the school year 2021 now with hundreds of thousands of exam takers using the system bringing efficiency in training at HUST during the pandemic.

01 Investigation of examination methods at HUST

At HUST, there are thousands of courses running with hundreds of thousands of students participating each semester. These courses included the smallest size (30 students) to large one (over 200 students) for professional training, lab/practicing classes, and theoretical ones, respectively. Therefore, the online exam classes had been organized based on these sizes. Moreover, arranging for almost all of exam subjects during a short time (only 3 weeks) is challenging. So, based on the different training programs, the characteristics of courses, there could be classified some kinds of online exam methods as bellow:

1. Quiz exam
   It is an objective test including various types of question such as: multiple choice, fill in the blanks, true or false and short answer, calculated question. It is organized as question banks and quizzes on the online system.

2. Open-ended essay exam
   A subjective test including questions that require students to write essays, papers, or reports. It evaluates students' ability to apply knowledge, thinking, and viewpoints to solve problems. Students do handwritten essays on paper, scan and submit them through the online exam system.

3. Question-and-answer exam
   It is the exam form that teacher gives questions, students have to answer right at the exam session or students preparing assignments/essays submitted on the system. The process needs recording and uploading to the online system.

4. Others
   other types of exams that based on synchronized online system (thesis defense...)

Based on the classification of exam methods, the Training Department of HUST also performed the preliminary survey about the readiness of students for online exams to ensure technical conditions (such as: the capacity of computers, mobile phones with availability of internet connection) via social networking channels such as: Planner, Face book and the school's SIS system. Table 1. Illustrate the results of registered courses corresponding with the online testing method. In which, the quiz exam was the most popular exam format, with 1,847 registered courses and 80,018 students. While the open-ended essay exam was the second most popular format, with 1,033 registered courses and 40,558 students, the question-and-answer exam had 973 courses with 39.412 registered students. The remainder is the “others" category including a variety of exam formats, such as oral exams, practical exams, and presentations included 148 registered courses with 5,296 students.

Exam formats	Number of registered courses	Number of Students
Quiz exam	1847	80,018
Open-ended essay exam	1033	40,558
Question-and-answer exam	973	39,412
Others	148	5,296

Table 1. The investigation of registered courses and students readily took part in the online assessment in the spring semester of the school year 2021.

02 Investigation for online assessment system

Firstly, to identify suitable systems that can support online exam formats, we investigated several online learning and exam support platforms. Specifically, Microsoft Teams [1] and Google Classroom [2] [3] are powerful online learning and exam support platforms whose service providers extend many support functions for educational institutions during the Covid period. Google Classroom is a combination of Google Docs, Google Drive and Gmail as an online classroom, so it can be said that this application is very versatile, multitasking. In which teachers can also create assignments and view their progress as well as leave assessments for students' work to help students improve their mistakes next time. The advantage of Google Classroom is that the tools are simple and easy to use, but nothing is perfect, if users want to log in to Google Classroom, they have to log in directly to Google Apps for Education without going through Email or other account types cause many inconveniences to users.

At HUST, lecturers and students are provided with copyrighted MS Office 365 accounts that offer a range of online services, including Teams. Using Microsoft Forms, instructors can easily create quizzes and assignments and view students' progress. While these platforms offer significant advantages, they also have some drawbacks. For example, they do not allow for the creation of question banks in various repositories, questions cannot be edited during testing, and they cannot be duplicated or restored for other exam classes. Additionally, there is a lack of systematic monitoring mechanisms and functions to limit cheating, leading to heterogeneity in learning management. This tool may deploy for Open-ended essay exam, Question-and-answer exam, and "Other" test method.

Besides, the survey of domestic online assessment commercial platforms, such as Viettel and VNPT [4], revealed that although these systems are well developed and based on the technical infrastructure of major internet providers in Vietnam, they mainly cater to K12 education with simple exam standards and limited types of questions. Therefore, they may not be suitable for a multidisciplinary university like HUST.

With the open-source software platforms that support online assessment functionalities, we considered the popular platforms such as Canvas, Moodle, and Open-Edx and Blackboard [5] . These act as not only learning management systems but also online assessment ones. In which, Moodle is considered the most powerful system [6] that have been deployed as a key learning management system at HUST currently [7]. Moodle is highly customizable functionality with lots of plug-ins. By default, it provides over 10 types of questions from simple ones (True/False, short answer, essay) to more complex ones (calculated, embedded answer) and modified question types. That is suitable for STEAM subjects. Additionally, Moodle allows deploying an e-assessments safely by using a web browser environment (SEB). This plugin regulates access to various resources such as system functions, external websites, and applications, and ensures that unauthorized resources are not utilized during the examination. Moreover, lecturers and administrators are able to set their private key for each quiz to enhance the security of exam sessions. Therefore, Moodle was chosen to deploy the online exam system for the HUST during the Covid pandemic.

03 Conclusion

The report has compiled surveys of the main online exams at HUST, tools that can support these types of exams in the covid period so that the appropriate exam system can be selected for other forms of assessment. together. With a very large number of online exams, it is necessary to have strong configuration systems to be able to hold many tests at the same time. Therefore, during the covid19 period, the quiz exam is deployed on an online exam system based on LMS, the Teams system used for Open-ended essay exam, Question-and-answer exam, and "Other" test method.

More details of the deployment of the online system will be discussed in the next reports such as the Regulations on organization of online exams of HUST; The process of students entering the exam through SEB on the LMS exam is supervised through TEAMS by the exam administrator; Training teachers to build a multiple-choice question bank and use the online exam system; Organizing testing system and demonstration exams for students to familiarize themselves with the online exam system. Some results for the online exam system will be illustrated in the next sections.

References

[1] D. Pal and V. Vanijja, "Perceived usability evaluation of Microsoft Teams as an online learning platform during COVID-19 using system usability scale and technology acceptance model in India," Child. Youth Serv. Rev., vol. 119, p. 105535, Dec. 2020, doi: 10.1016/j.childyouth.2020.105535.

[2] I. Hussaini and I. Libata, "Effectiveness of Google Classroom as a Digital Tool in Teaching and Learning: Students' Perceptions," vol. 4, pp. 51–54, Apr. 2020.

[3] "Google Classroom Tutorial - Creating Assessments using Google Forms." https://sites.google.com/a/mail.brandman.edu/edsu-533-classroom-tutorial/creating-assessments-using-google-forms.

[4] "VNPT E-Learning - Giải pháp đào tạo trực tuyến cho doanh nghiệp." https://elearning.vnpt.vn/.

[5] A. Elzainy, A. El Sadik, and W. Al Abdulmonem, "Experience of e-learning and online assessment during the COVID-19 pandemic at the College of Medicine, Qassim University," J. Taibah Univ. Med. Sci., vol. 15, no. 6, pp. 456–462, Oct. 2020, doi: 10.1016/j.jtumed.2020.09.005.

[6] P. Hill, "Moodle US: A changing business model that goes beyond the US," PhilOnEdTech, Apr. 29, 2021. https://philonedtech.com/moodle-us-a-changing-business-model-that-goes-beyond-the-us/.

[7] "HUST Blended Learning." https://lms.hust.edu.vn/.

Challenges and ideas of using RPA in solving administrative problems for Vietnam higher education

#RPA, #Robotic Process Automation, #Higher Education

Mr. Chu Van Huy / Banking Academy of Vietnam

University governance requires performing complex tasks, from curriculum management to resource allocation, people management (staff, lecturers and students). To evaluate whether the management is good or not, the opinions of customers (who are students) will be a very good measure to evaluate. However, with the feedback of students, determining the right solution to solve it quickly and effectively is always a big challenge. Robotic Process Automation (RPA) can be considered a good idea to support solving administrative problems for higher education.

01 Issues in management activities at the university

In May 2023, I had the opportunity to attend a dialogue session between the leader of higher education in the North of Vietnam and students. To prepare for this dialogue, the university conducted a survey of nearly 16,000 students, belonging to 202 academic classes (27 classes of high-quality systems, 175 classes of the regular system) and collected 383 questions, feedback, suggestions of students to the school.

The survey results are aggregated into 15 main groups of issues related to students (Table 1). In each problem group, the university determines what the student's issues.

Table 1. Statistics of some main groups of problems related to the problem students mentioned

No	Groups of problems related to the problem students mentioned	Number of issues
1	Register for classes, organize classes	35
2	Materials and textbooks Program, course content, assessment of learning results	42
3	Teaching methods	18
4	Academic advisor	8
5	Exam, test	45
6	Research activities	8
7	Internships End-of-course activities	8
8	Facilities for teaching and learning	51
9	Dormitory, canteen, parking lot, school security, prevention of social evils	82

No	Groups of problems related to the problem students mentioned	Number of issues
10	Library System of learning materials, documents	18
11	Health care and disease prevention	0
12	Implement modes for learners	0
13	Spirit and attitude of staff, lecturer, department, faculty, center,...	25
14	Activities of Youth Union, Student Union,... in students	28
15	Other problems	15
Total		**383**

Source: Statistics by the author

After the dialogue, the main issues related to the units in the university (departments, centers, faculties, etc) that need to be overcome are reviewed to find out the main causes and the ways to increase the satisfaction level of the students.

Table 2. Summary of major problems related to some units in the university

Units in the university	Major problems that need to be fixed	Related to Process or System?
Academic Affairs Office	Reviewing regulations related to functions and duties	Process standardization
	Communicating to all students by many channels, in different ways, the content of all training regulations for students to know and implement.	Student Portal (SP), Social network (SN), Email,...
	The reception and handling of problems with students should be flexible to ensure the best convenience for students	Training management system (TMS), SP, SN, Email,...
	The implementation of the Learning Management System (LMS) that needs to be deployed, during the implementation process, it is necessary to coordinate with the IT center and suppliers to promptly fix errors and arising situations.	LMS
	Immediately deal with the students' complaints such as: answering student questions, processing registration, postponing exams, etc. to ensure compliance with regulations and most benefits for students.	TMS, SP, SN, Email
Student Affairs Office	Disseminate and provide regulations, regulations and guidelines related to learners' rights and obligations.	SP, SN, Email
	Disclosure of information related to student interests such as scholarships, forging points, tuition fee exemption and reduction, subsidies, etc. publicly, democratically, transparently, in accordance with regulations.	SP, SN, Email
	In 2023, by 2024 at the latest, the entire process of handling administrative procedures must be digitized for students, so that students' emails cannot be responded to in a timely manner.	Student management system, SP, SN, Email,...
Department of Facilities Management	Review all facilities, equipment and related issues. Timely repair equipment to support learners at the lecture hall.	Facilities management system

Units in the university	Major problems that need to be fixed	Related to Process or System?
Department of Facilities Management	Regularly inspect and supervise, urge the security, cleaning, etc. to perform well the committed work.	Facilities management system
	Organize some halls as open spaces for students to study, group activities, discuss, etc.	
Library and Information Center	Review all regulations guiding the loan and return of books, management and use of library materials.	Process standardization
	There is a solution to notify the time to borrow and return books automatically.	Library management system, SP, Email,...
Center for Training Support	Timely capture students' reflections and recommendations to coordinate, handle, ensure security, order, safety and hygiene and other legitimate interests of students.	SP, SN, Email,...
Youth Union, Student Union	Ideal education for students. Besides, it is necessary to listen and create many useful playgrounds and activities for students.	SP, SN, Email,...
Faculties	Review the content students ask, complete and timely information for students.	SP, SN, Email,...
Academic advisor	Reviewing content related to academic advising work	Process standardization
	Support, advice and focus on students who are weak and under warning.	SP, SN, Email,...

Source: Statistics compiled by the author

Thus, it can be seen that there are still some limitations that need to be overcome for the university's governance to become better, such as:

1. Need to review and standardize business processes.

2. Lack of an automatic solution to notify students of necessary information through some main communication channels (such as SP, SN, Email, etc.) in the most proactive, easy and natural way.

3. Lack of automated solution to collect student feedback continuously, in multiple contexts, in real time.

Implications

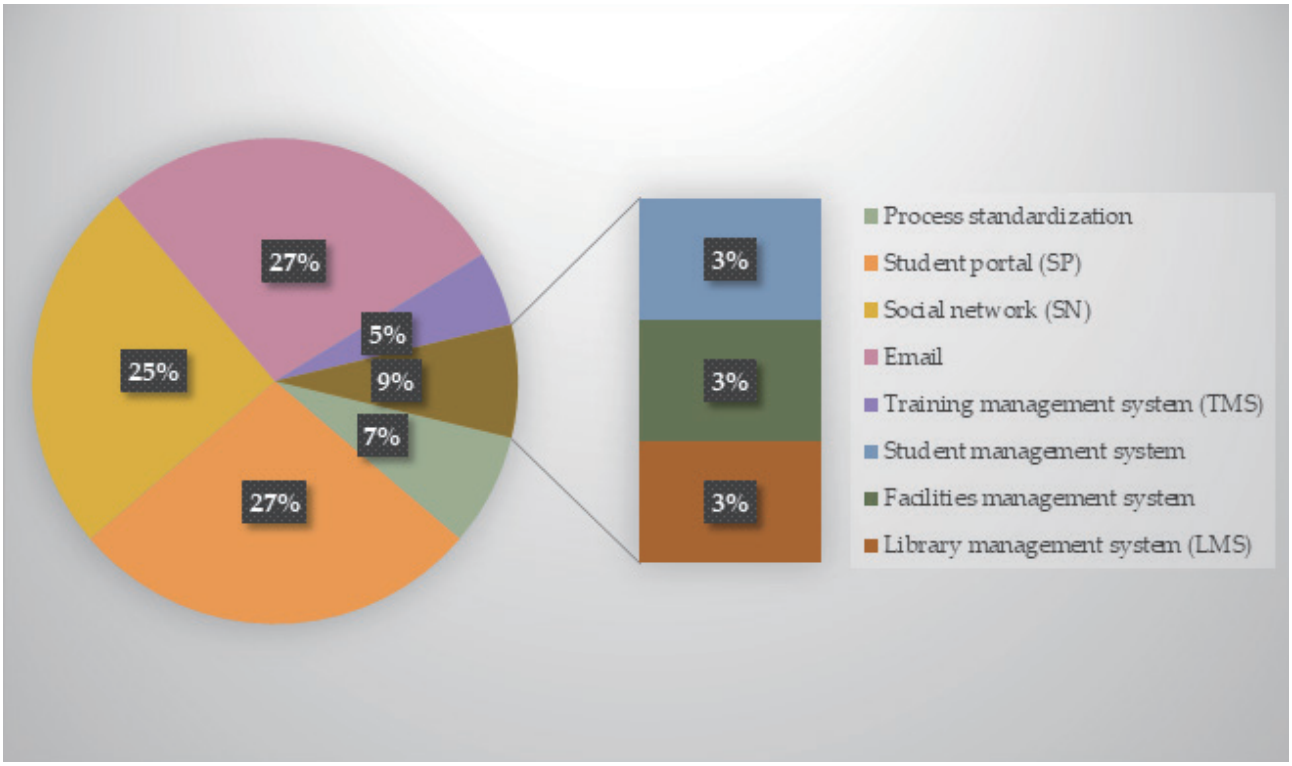
Understanding learners' wishes, committing to bring the best to learners, ensuring compliance with regulations, suitable to the circumstances of each school is considered the guideline of many higher education institutions. Educating students to clearly see their roles and responsibilities in building the school by being more active in learning, preserving the cultural environment, landscape, being more conscious, behaving more civilly, enthusiastically participating in university activities, without negative behavior. Therefore, to solve the problem of university governance, the requirement is to build a spirit of readiness for innovation, aiming to create and keep the connection between the university and students continuously in real time.

02

Some ideas to apply RPA for Vietnam higher education from the perspective of administrators

Through the statistics from Table 2, it can be seen that there is a huge amount of work related to the interaction between units in the university with processes and systems (SP, SN, Email, etc.) via computer (Figure 1). The above workload is very suitable for the application of RPA technology that I mentioned in volume 1st report [1].

Figure 1. Process and system statistics in interaction with students



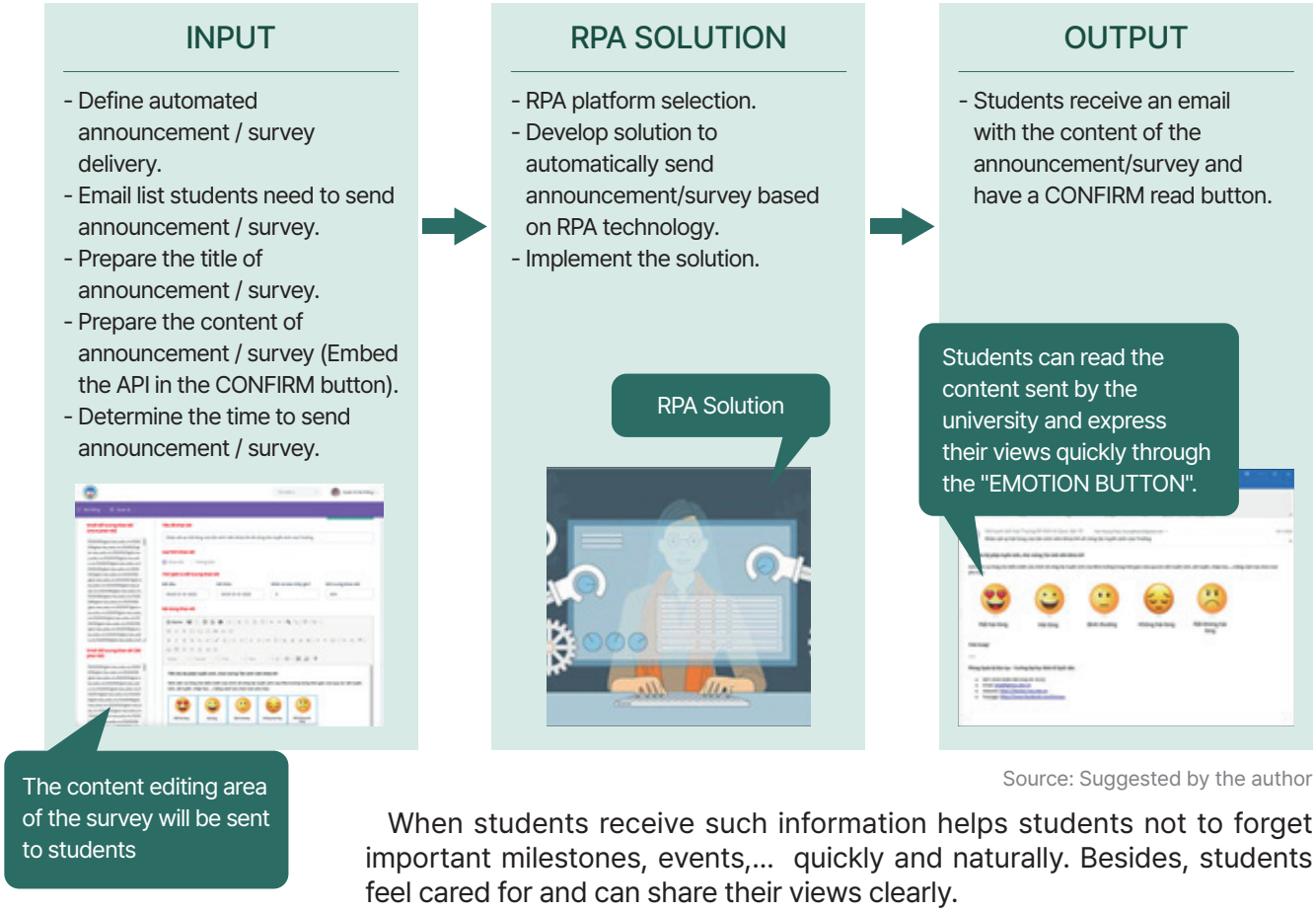
Source: Statistics compiled by the author

To be able to apply RPA technology to support university administration, below are two ideas that I would like to suggest. These ideas have been tested in several cases at some universities in Vietnam [1], [2], [3].

▶ Idea 1: Use RPA to automatically send announcements/ surveys to each relevant student via Email

Sending announcements/surveys to individual students or groups of students often takes a lot of time and effort of the units in the university (Figure 2). Therefore, an RPA solution can be established that allows staff and lecturers to enter some clear input data. Then the RPA solution will automatically send the information to the students via Email. Finally, the students read and confirm that they have read it. This is really meaningful to help schools communicate, monitor and understand the student's interactive status.

Figure 2. Proposing RPA solution in sending announcements/surveys to each relevant student via Email



Source: Suggested by the author

When students receive such information helps students not to forget important milestones, events,... quickly and naturally. Besides, students feel cared for and can share their views clearly.

If the above can be done, complaints about the units in the university not providing enough information for students will be minimized. In addition, the obtained survey results will help the leaders of the units evaluate whether the services that they provide to students are good? Are there any improvements to the products or services offered to students? As a result, student satisfaction and engagement with the university improved significantly.

▶ Idea 2: Use RPA to automatically collect student feedback through Email announcements/surveys

One of the common problems is that unit leaders do not accurately measure the effectiveness of student announcements and feedback in communication. As a result, policies are not promptly adjusted to the reasonable expectations of students. Therefore, one possible idea to measure university-student interaction is to use CONFIRM BUTTON in the body of Emails sent to students. Specifically:

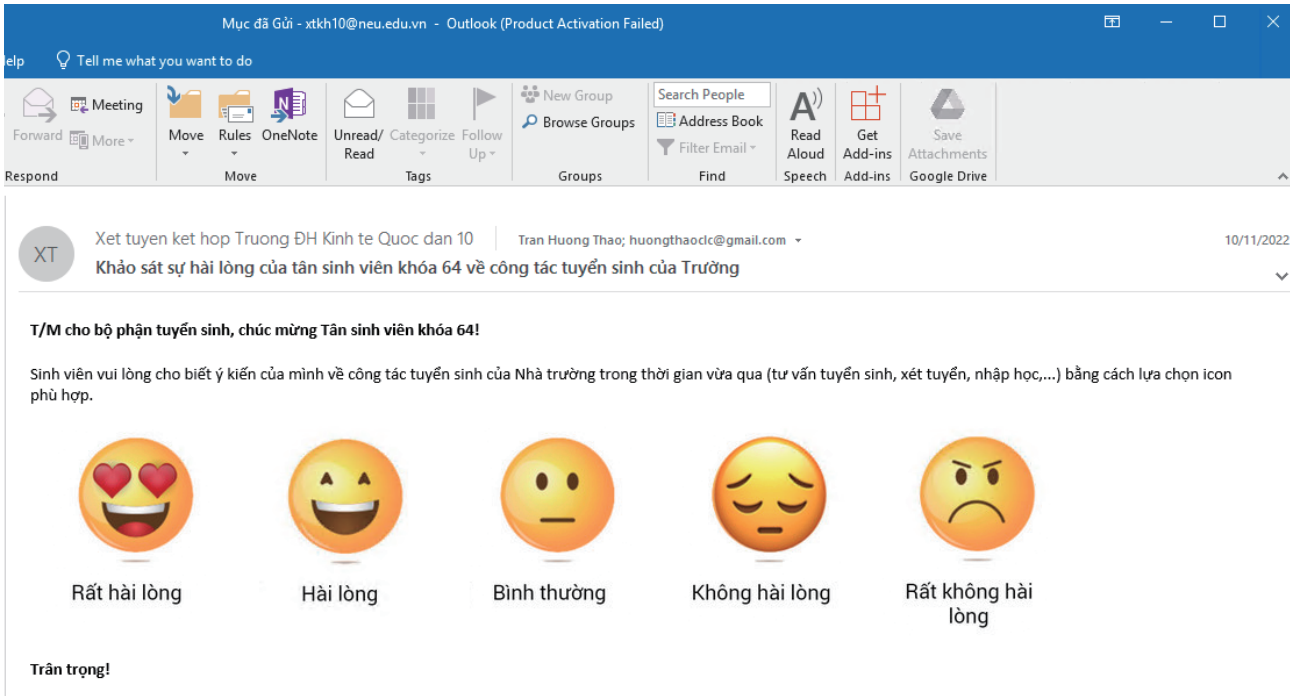
1. The unit in the university should set up a CONFIRM BUTTON, in which the button will embed an API to collect satisfaction (with survey) or read status (with announcement) of each student.

2. When a student clicks on the CONFIRM BUTTON, the API will be executed and the student's feedback will be recorded.

3. For non-interactive students, the university may resend the EMAIL to these students after a certain period of time. If the student is still not interacting, the academic advisor will find the reason. Thereby, bringing students back to focus on learning.

The idea above helps the university understand students throughout the learning process. It can help make timely adjustments to improve student satisfaction. In this context, RPA fills in the information in the APIs embedded in the CONFIRM BUTTON, including (1) SURVEY_ID (with survey) or ANNOUNCEMENTS_ID (with announcement), (2) STUDENT_ID (with all), (3) SATISFATION_LEVEL_ID (with survey) for each student (Figure 3). From there, it helps to record the feedback of each student if they CLICK the CONFIRM BUTTON. The process of collecting, synthesizing and analyzing data becomes much simpler than the usual methods of sending announcements and surveys.

Figure 3. Ideas for collecting student feedback data via EMAIL CONFIRM BUTTONS



Source: Experiment by the author [2]

In order to record student feedback effectively, the school should make a policy and agree with all students when they enter the university. Besides, it is necessary to have a synchronous implementation plan in the units and anticipate some challenges to overcome in the process of implementing the RPA solution [4]. In addition, it is also necessary to calculate the appropriate frequency of announcements/surveys throughout the university, to avoid annoying students.

Implications

It is very important to send announcements/surveys to students in order to keep a constant connection between the university and students. The above work becomes easier with the support of RPA technology to connect input data sources, transfer information to each relevant student. Thereby, the collection, statistics, and analysis of student feedback data becomes faster. As a result, university leaders can make real-time decisions, helping to solve governance problems in the current fierce competition.

Summary

Higher education has many administrative challenges such as how to collect, understand and provide the best products and services to students. To solve the above problem, it is necessary to find innovative solutions to improve management processes and enhance student satisfaction. RPA emerged as a tool to help fulfill the expectations mentioned above. RPA helps to realize the idea of automating tasks related to sending, communicating and collecting feedback for students with promising results. Using RPA can automate tasks, improve communication channels, easily collect feedback, make better decisions for university administration. However, to be able to implement an RPA solution successfully, higher education institutions need to carefully plan, test thoroughly before expanding, prepare financial and human resources, especially the commitment and support of many stakeholders.

References

[1] Chu, V. H. (2023), Towards applying Robotic Process Automation for Vietnam higher education from the perspective of lecturers, p. 9-14.

[2] Chu, V. H., & Pham, X. L. (2022), The application of akaBot platform in improving learners' satisfaction levels: implementation at some higher education institutions in Vietnam, National Conference Proceedings: "Digital Transformation - From Data To Automation"

[3] Chu, V. H., & Pham, X. L. (2022), RPA application to promote automation in training management, International Conference Proceedings: "Digital Transformation in the Context of Industry 4.0".

[4] Chu, V. H., & Pham, X. L. (2023), A new approach in developing business process automation solution in the context of autonomy at Vietnam universities, colleges, National Conference Proceedings: "Investment resources for higher education in the context of autonomy".

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